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Area 1.2 - Task 1: Organic viticulture and wine processing

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1 Introduction

This internal report on existing literature aimed at gathering relevant information from project partners and other experts from European countries not directly involved in the project to be able to extract key questions, useful to tune following research activities and formulate regulatory recommendations.

Papers refer to a period going from 1975 to 2006, and were gathered from literature surveys conducted in the following partners country: Germany, Switzerland, France and Italy; also, additional countries participated through the involvement of IFOAM EU group: Hungary, Spain, Portugal and Bulgaria. The investigation took into account literature coming from official publications and from more informal sources, such as grey literature, including comments and debates spread through the internet.

The overview was organized by specific areas, dealing with:

- 1) Standards debate on national or local standards and regulation;
- 2) Oenological practices for organic wine making in different regions;
- 3) Agronomic impact factors of organic viticulture which affect wine quality
- 4) Relevant consumers and market studies.

With regard of section 3, the investigation about viticulture techniques was narrowed down; otherwise it could have included a too wide range of studies, making it difficult to analyze properly the issue.

Similarly, papers on oenological practices included in this review were selected by key words in order not to widen too much the spectrum of material.

Consumers' and market studies taken into account were only the most recent ones, as the sector is evolving very rapidly.



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2 Specific areas

2.1 AREA 1 – Standards development and debate

This section of the literature review intends to report the national and local debate around organic wine making standards applied throughout Europe, rather than collecting and analyzing the standards themselves, which will be done in detail in task 2.2 and related deliverable.

30 references were grouped under this section, published between 1997 and 2006, but most of them are very recent.

Publications collected came from the following countries: Bulgaria, Portugal, Switzerland, Austria, Germany, Italy and France.

As a general statement, all papers report the lack of legislative framework in organic wine making as a problem which induces a disparity within countries and which spreads confusing information towards consumers (Montanari, 2001). For instance, there are differences in labelling as not all European countries are allowed to name “organic wine” on the bottles and the use of EU “organic” logo depending on interpretation of common regulation within Member States.

In some cases, different private standards were developed at a national or local level in order to respond to producers and consumers requests, who ask for more clarity about organic products and not only about organic grape as a raw material to be processed by un-regulated wine-making procedures (Ahmedov, 2006; BioSuisse 2006; Biovin, 2006; Demeter 2006; AIAB, 2002; Vitisswiss, 2003; Kauer, 2004; Maier, 2005; Römmelt, 1998; informal Spanish draft on standards, 2006; ITAB, 2003).

Existing local/private standards take into account several aspects of wine making practices, from techniques to machineries used, going through the “thorny” problem of additives and co-adjuvants to be or not to be used in organic wine processing (Basler *et al.*, 2002; Hofmann, 2005).

Herdam (2004) reports a comparison of the wine-making standards from different associations (FNIVAB, ECOVIN, AIAB), showing their common features and their differ-



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ences, partly connected to the different natural, regional conditions, existing in the list of additives as well as in the maximum content of SO₂. The differences between private standards in one country (ECOVIN - Bioland-Demeter) appeared less important than the differences between standards from countries (France - Germany - Italy).

The Swiss norms, for instance, point out a positive list of allowed substances and cellar treatments to be used in processing, as well as sanctions rules.

Several standards from different countries identified three levels of advice on practices or additives: recommended, allowed and forbidden, establishing a gradual restrictive framework in organic wine making methods (AIAB, 2002, Biovin, 2000, Basler *et al.*, 2002).

Moreover, about specific additives, the use -in terms of quantity- of SO₂ occupies a central issue in the debate and makes the difference between private standards from different countries or within them (Posocco, 2006; Piccinin, 2001, several web-based comments and informal Spanish draft on standards). The question whether it would be possible to produce wine without any sulphite is discussed by conventional and organic winemakers or oenologists; the former affirming that is not possible, the latter debating about the possibility of producing wine with a very little amount of SO₂, variable from one country to another and according also to climatic and geographic conditions. Some importance is devoted to the consequences for consumers in terms of health problems or on global pollution due to the result of this gas on the greenhouse effect.

A key question coming out from the comparison of different national or local standards is the difference in natural and regional conditions. The use of additives, in particular their application levels, as well as procedures can vary from one region to another, following different needs and traditions which depend on geography and climate of the area, or also according to consumers' expectation. Therefore, one question emerging from this consideration could be: would it be feasible to include all local needs in a common legal framework for organic wine-making all-over Europe? How to harmonize different necessities and requests amongst countries and within them?

Some references report bio-dynamic practices of wine-making. They show a good overlapping between organic and bio-dynamic guidelines, while the use of some specific products, particularly bio-dynamic preparations, differs. Same consideration could



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be done about timing, as bio-dynamic wine making is moon cycle-dependent, for instance. Then, would these differences be incorporated and reflected by the new regulatory framework?

2.1.1 Internet debate on wooden chips for wine making

Due to a pressure from the United States on Europe, the issue of using wooden chips in wine production was raised by national and local mass media. Consequently, a debate is ongoing through newspapers, Internet fora and websites devoted to wine or organic farming in several countries, at different levels: producers, oenologists, consumers, are all involved in the matter.

In Italy there are mainly two positions about the use of chips: the “conservative” one, which refuses it because it cheats consumers, confusing barrique-based wine with chips-based wine, without declaring it on the label, and, also, because it goes “against tradition”; and the sceptic one, which argues that use of barriques is not a traditional Italian method at all, and beside this, it’s not such a big deal, as wine coming from the two technologies could differ quite much depending on winemakers ability.

Currently, a petition was signed by some local authorities, politicians, environmentalists, farmers’ unions and oenological experts, to completely ban the use of wooden chips in European wine, and if not possible, at least to have it indicated on the label.

Besides, the environmental question was raised by those in favour of wooden chips, pointing out that a big part of wood forests could be saved using chips instead of barriques.

One point of agreement between the parts seems to be the intention of forbid the use of chips for AOC wines (DOC, DOCG), by modifying accordingly their standards.

Also, some representatives from both parts called attention on the general issue of co-adjuvants and additives in wine, which are not well known by consumers and mention the necessity of promoting clear labels about wine making procedures.

During a wine seminar in Switzerland (Roland, 2002), some experts discussed the use of wood chips to give wine a more wooden and vanilla aroma. One general opinion expressed, was that it is more sustainable to use wood chips rather than to deforest oak forests to produce wine casks.



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2.2 AREA 2 - Oenology

As reported in the Guidelines, the oenological chapter of the Survey was mainly focalized on technical, scientific and grey literature, treating about oenological practices potentially useful in organic wine production; 106 references were included in the list reported below; papers were mainly published in the last 6-7 years.

The negative effects of sulphites on human health are well known since different years; one of the main goals of organic winemaking is to find suitable technologies to reduce the final amounts of sulphur dioxide in wines, maintaining good product quality, and considering either consumer security as regards healthy aspects or environmental impact.

Different tools have been recently developed to help the producers in performing these actions: various manuscripts are reporting scientifically-based data about these recently developed low-impact technologies, also as regards their comparison with traditional SO₂ use. Anyway, there are very few specific results as regards organic wine-making: considering the actual state of the art in oenological practices, skills and technologies, how many could sulphur dioxide addition be reduced in wines? Could it be completely avoided in winemaking process? Could these low-impact technologies lead to the production of high quality wines?

Lysozyme is one of the additives that could partially or totally substitute sulphites, particularly as regards their anti-microbial activity (Posocco, 2006; Bartowsky *et al.*, 2004; Françoise, 2005 ; Gafner, 2002; Gerbaux, 2000; Gerbaux *et al.*, 1997; 1999; 2004; Yun *et al.*, 2002; Weiland, 2002): it has been largely studied in last years to control lactic bacteria populations.

The evaluation of lysozyme use in winemaking is relating to its effects both on wine stability (effects on bacteria populations, malolactic fermentation management, biogenic amines contents, effects on protein stability) and on wine sensory characters (wine astringency, volatile and non-volatile fraction). No experimental results were found about specific use of lysozyme in organic winemaking.

Ascorbic acid (AA) was mainly studied as regards its antioxidant effects when added in wine; minor information are available about its addition in musts, where it is particularly used together with sulphites, and never alone (as done – for example – in fruit juices).



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As regards the reported results, they are quite ambiguous. In some papers, the addition of AA in white wines gave good results: wines were more coloured, but added ascorbic acid either had no effects on their aroma or gave them less oxidized and more fresh fruity notes (Charrier and Cottureau, 2003; Sefton and Waters, 2005); on the contrary, other papers report its ability to induce browning of catechins, and untypical aging sensory characters in bottled wines (Bradshaw *et al.*, 2001). No specific experimental data are reported about organic winemaking.

Beyond to ascorbic acid, glutathione and other natural substances (such as cysteine, or homocysteine) could be interesting molecules for partially substituting SO₂ antioxidant properties (Vaimakis and Row, 1996; .

Their effects against wine and must oxidation are starting to be deepened (Roussis *et al.*, 2000; Singleton *et al.*, 1995): researches have good knowledge as regards their evolution during fermentation (Park *et al.*, 2000) and wine storage, but further deepening are necessary to clarify their effects in wine production process, and to evaluate their role in redox equilibrium of wines. No references were specifically oriented to organic winemaking.

Different papers are treating about some health related compounds, such as ochratoxin A (Drouillard *et al.*, 2003; Dumoulin and Riboulet, 2005; Ospital *et al.*, 1998) and biogenic amines (Torrea Goni and Ancin Azpilicueta, 2001; Bell and Henschke, 2005; Coton *et al.*, 1999) (but also geosmine, and on the other side resveratrol, and /or other natural antioxidants), and their occurrence in musts and wines; anyway, there are few specific data as regards organic winemaking or comparing traditional winemaking with organic one.

The scientific knowledge about microbial metabolism and fermentations management is already well developed; many papers have been published about optimization of yeasts and bacteria nutrition, selected micro-organisms management and characteristics, production of sulphur compounds by yeasts and their relationship with SO₂ and nitrogen metabolism, production of acetaldehyde and volatile acidity during fermentation. In more recent works, researcher's interest seems to be focalized on sulphur dioxide production by yeasts (considering its relationship with yeast sulphur metabolism and nitrogen nutrition); this topic is particularly interesting in organic wine production, because directly involved in the definition of the "minimum level" of sulphites which



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should be admitted in wine. Yet, no specific data are reported about wines from organic grapes.

Certain recent technologies focalized on oxygen management, could be also used in organic sector; hyperoxygenation could help organic wine producers to better manage botrytized grapes, reducing polyphenol - oxydase activity, and improving wine quality; the problem is related to the fact that wines produced by hyperoxygenation have often similar sensory characters; further deepening will be necessary to find solutions for this problem, without affecting both wine quality and terroir-related characters.

Other practices such as cross-flow filtration, flash pasteurization of crushed grapes, inert atmosphere (nitrogen or argon) storage, microoxygenation can be also interesting for organic winemaking; their use in different steps of production process could be really useful in SO₂ reduction strategies. Some of them are already well known by the technicians, some other need further studies before to be applied on organic productions.

It is clear that very few papers reporting specific data comparing wines from organic viticulture with conventional ones; for this reason it is necessary to increase the collection of experimental data in a way specifically oriented for organic wine production.

Scientifically based survey on wood chips

Nowadays, there are many different commercial preparations that allow the high costs and long duration of the aging period to be avoided. These new technologies consist on soaking fragments of oak wood, with different shape, size, toasting level and oak species, in wine; oak wood chips should be included among these practices. Ecological advantages of use of oak fragments should be considered too; much less wood is wasted (Binder, 2003).

Zironi *et al.*, 2003 and Tat *et al.*, 2003 describe the different kinds of oak fragments and the suggested way to use them.

Literature demonstrate that wood greatly interacts with wine also in the form of chips: extraction of volatile and non-volatile substances occurs; among these, extraction of individual ellagic tannins (castalgin, vescalgin, grandinin, roburin D and E) and ellagic acid from oak wood chips (*Quercus pyrenaica*) was studied in model wine solutions



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with different pH, temperature, ethanol concentration and for different times (Jordao *et al.*, 2005): vescalgin content is higher at pH 3.7 than at pH 3.1; the reverse is true for castalgin. Apart from this, effects of pH and ethanol concentration and pH on extraction of these constituents is considerably smaller than effects of temperature; concentration of compounds increase during the first few weeks of extraction, then decrease, but at the end of the 104 day extraction period, ellagitannin content is higher for the 12°C than the 20°C treatment. Besides, oak influences greatly the modification of polyphenols of wine, with consequent stabilization of colour: fixed pigments in stable polymers increase in treated wines (Piracci *et al.*, 2001, Cichelli *et al.*, 2004). This phenomenon occurs more rapidly than in barrels: del Alamo-Sanza *et al.*, 2004 observed that loss of anthocyanins occur at a faster rate and the extent of polymerisation is greater than in wine aged without oak chips. Color intensity of wine treated with chips is greater than that of wine stored in barrels, mainly due to the contribution of yellow and blue components. Chips are available in different origins of woods, sizes, toasting levels and so their properties are different; results indicate that loss of anthocyanins and a greater number of polymerizations, in a red wine monitored during storage in bottles, are most rapid if aged using staves (in respect to barrels or using chips). Use of French oak slightly decreased anthocyanins loss as compared with losses using American or Hungarian oak. (del Alamo-Sanza and Nevares-Dominguez, 2006). Besides according to Tat *et al.*, 2004, extraction of non-volatile substances in model solution (as indicated by extinction value at 280 nm) is greater for French than for American oak, increases with decreasing particle size of the oak chips, and decreases with increasing level of toasting. Studies carried out on real products indicate that colour intensity of red wine treated with toasted chips is greater than that of products aged using light toasting oak, especially when combined with micro-oxygenation (Tat, 2000). In fact, the gradual gas exchange properties of oak barrels may be replaced by controlled microoxygenation (Binder, 2003).

As regards the extraction of volatile compounds from wood, the following compounds have been identified in the model solutions after soaking: trans and cis β -methyl- γ -octolactone, phenolic aldehydes, volatile phenols, terpenes, norisoprenoids, and furanoic compounds. Some compounds reach their maximum concentration by the medium toasting process and some others by the heavy toasting one; anyway, the highest concentration of volatiles is found in medium toasted chips. French and American oak have a different aromatic composition. French medium and heavy toasted chips release a larger quantity of volatile compounds than the American ones. The finer the size, the easier is the migration of volatiles compounds into solution. However, the more volatile ones are lost in the oak wood milling process: their concentration in wine results from the balance between extraction and loss for milling (Tat, 2000). According



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to Guchu *et al.*, 2006, chemical and sensorial analyses of wines reveal that the effect of the toasting of oak chips on wine characteristics is greater than the type of oak used. Sensory descriptive analysis of red wines undergoing malolactic fermentation with oak chips (Gutierrez-Afonso, 2003), shows that American oak chips produce a greater intensity of coconut and vanilla and a greater degree of astringency than barrels. Differences in the variety of oak used (American or French) are more noticeable in oak chips than in barrels. The quantity of oak chip used has a greater effect than the type of oak used to make the chips or barrels. The presence of oak chips increases the intensity of the red fruits and vegetative attributes. Some other studies regard the comparison between chips and barrels; Piracci *et al.*, 2002, indicate that use of chips has approximately the same effect (e.g. pH, color, polyphenols and flavonoids contents, sensory rating) on wines as the traditional barrels (especially when combined with micro-oxygenation), although the degree of toasting caused slight differences.

According to Bosso *et al.*, 2004, effects on sensory properties of young wines differ little between addition before or after alcoholic fermentation. For the 2nd to 3rd year-old Chardonnay wines, samples made with wood chip treatment after alcoholic fermentation, which have better structure, are smoother and have a more complex aroma, and are preferred. Authors suggest that wood chip treatment of white wines is best applied after alcoholic fermentation. Perez-Coello *et al.*, 2000 have a different opinion: they observe that fermentation yields are higher than in the control fermentations carried out in the absence of wood, and production of volatile substances during fermentation (alcohols, esters, and acetates) is also higher and depends on the type and amount of the oak; some of these substances are consumed partially by yeasts during fermentation. Sensory results favour wines produced by fermentation in the presence of oak chips, which retained part of the original fruity aroma of the must.

In general, bibliography demonstrates that oak influences greatly wine, both in the form of barrel and of wood fragments; authors did various attempts of comparisons. Besides, some authors attempt to find markers for distinguishing use of these two ageing systems: redox potential (del Alamo-Sanza *et al.*, 2006), or amounts of syringaldehyde (Arapitsas *et al.*, 2004). Nevertheless, there is a great lack of homogeneity among the technologies of productions of wood fragments and of barrels and also among the ways of use (Ducournau *et al.*, 1999) and this can explain the differences in results.

Finally, as regards safety topic, alcoholic beverages may contain carcinogenic polycyclic aromatic hydrocarbons (PAH) from toasting process of woods; some bibliography exist for barrels but there are almost no references about chips. According to Garcia-Falcon and Simal-Gandara, 2005, charring method strongly influenced PAH levels in alcoholic beverages. Traditional charring produced higher levels of PAH in alcoholic beverages than convective toasting. The sum of the analysed PAH concentration in the



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aged alcoholic beverages studied ranged from zero for a white wine to 172 ng/l for a 'brandy de Jerez solera'. The carcinogenic indicator benzo[a]pyrene was found at concentration of <10 ng/l. It was concluded that the PAH concentration in alcoholic beverages were very low relative to those in smoked or char-broiled foodstuffs. As regards chips, a little mention about IPA is present in the article of Cichelli *et al.*, 2004; authors affirm that GC-MS analysis do not indicate IPA.

2.3 AREA 3 – Viticulture

On the basis of the established Guidelines, this part of the Survey was focalized on scientific and technical papers treating about any agronomical technique (particularly those allowed in organic agriculture) that may affect wine-making process and wine quality; 38 references (mainly published in the last 6-7 years) were included in the list below.

As concerns the references found for this area, different papers treat about specific organic topics: allelopathy as a natural phenomena to be considered in weed plant control; pesticide residue levels in organic wines in comparison with conventional ones; plant protection in organic grape growing; terroir characters in traditional and industrial wines; effects of different on-field treatments (fertilization, leaf removal, training system, pruning) on grape and wine quality; effect of harvest time on grape and wine characteristics; water management in the vineyard. Experimental results concerning effects of N nutrition of vine and composition of the grapes should be considered as good bases for explaining the relationship between agronomy and oenological constraints to be explored in the WP 2.4. (Delas J.)

From the oenological point of view, some grape varieties are particularly interesting in organic viticulture; for their resistance to cryptogamic diseases, they are a suitable tool to reduce on-field treatments, giving to viticulture a low environmental impact. The problem connected to resistant varieties, is mainly related to the quality of the obtained wines, because they are often affected by negative sensory notes (such as foxy-like flavours). Researchers have already studied the problem; further deepening could be useful to increase the knowledge, functionally to their use in organic sector (also considering grape phenolic compounds, such as viniferins or resveratrol).



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Agronomical area seemed to be more specifically related to organic concepts, in comparison with oenological survey; anyway, a lot of agronomical factors are connected either with wine quality or with environmental and healthy-related aspects. For this reason the problem remains a correct and functional management of all the information supplied by these factors, to give farmers easy decisional tools to be practically used on-farm.

2.4 AREA 4 – Consumers and market studies

Under this section, we included all the references reporting consumers' consultations and market studies which dealt with organic wine. We listed 28 papers from different sources, published between 1998 and 2006.

Some studies aimed at identifying consumers' perceptions about organic products in general and sometimes in particular on organic wine. From a Swiss survey on wine consumption (Association Swiss Wine, 2004), it emerges a general satisfaction of consumers regarding national wine quality, whether a disappointment was registered about its price, especially in restaurants. On the opposite side, another conclusion regarding organic products arrives from an Italian study (Santini, 2006), where most consumers declared to be interested in a more "natural" production process, and are willing to pay a bit more for that product.

Same position is detected in Germany through several consumers' surveys (Engelhard, 2001, press release on EMNID survey), and a similar conclusion was reported by an English governmental survey (TNS Westgate, 2003). German consumers seem to request organic wines with low tannin content, a bit of sugar and with fruity taste (Hubert, 2006).

Besides this, organic wine consumers in Italy tend to associate wine consumption with health, because of its antioxidants and beneficial substances content (Santini, 2001).

Another Swiss source shows a qualitative differentiation recognized by consumers from traditional to organic wines, and Swiss consumers stated that information on label is lacking, and that it should be short, comprehensible and with much data -origin, variety, additives (Rufener, 2004).

French consumers are little informed on wines from organic grapes, despite of standing of 3 private standards at French level. Market stakeholders recognize a very good quality for organic wines, but regret they are not supported by a better communication. Or-



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organic wines consumers seem to be non typical, considering current organic food consumers: they buy less organic food and care more for the price. (Renaudon, 2002). Chevalier (2004) assesses different types of consumers for organic wines, depending on the type of wine: typical organic consumer poorly interested by alcohol, new urban organic consumer looking for wines of “terroir”, good wines drinker for high premium.

Other papers analyzed the organic wine market sector, reporting trends and expectations. Responses come from organic wine producers and from market studies.

Generally speaking, organic wine seems to be achieving a bigger market space from year to year. Germany registered a positive annual trend between 20 and 32% of organic labelled wine, while Switzerland points out an increasing market importance of organic wine from resistant varieties, and registered a positive trend for national organic wine production. There is a demand of wine “de terroir”, with re-evaluation of traditional varieties as well.

In France, (Romanens, 2002) it appears that the market of traditional sector (cellars and restaurants) remains open for organic wines, which quality is widely recognized. A collective approach is useful to assure knowledge and recognition of organic wines by consumers, but the winemakers themselves must define their own market strategy according to the profile (nature, price level) of their products. The catering sector is an important target, due to the increasing habit of having meals at restaurants and the opportunity it offers to discover new products.

The German market for wines from organic grapes is estimated at around 25 millions of bottles (1% of the total wine market) by Chevalier (2004). The author affirms also that wines sold in bulk are making the main import volumes (half of the French organic wines exported to Germany, at a departure price of 1,30 to 2 €) in the supermarkets and on specialized market. Organic shops and cellars remain the most important markets. Quality is the first strategic point to consider, and it is necessary to choose the best distributing system for each type of wine. An organic labelling seems to be positive.

Italy points out a positive trend which in the last 10 years achieved an average of 60% annual growth rate for organic wine production. The main trade channel is direct selling, followed by specialized (organic) retailers. In France, the traditional wine trade channels (cellar-shops and catering) offer a growing market share for organic wines, which are mostly chosen for their best quality/price rate. These qualitative results are coherent with other observations on the general French market for organic food, show-



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ing that the “new” organic consumers care more for their health and pleasure than for the preservation of environment when choosing organic food.

Moreover, organic wine is occupying a growing market segments in conventional trading chains, such as the large-scale retail, supermarkets, and so on.

3 Research framework

From an overall analysis of retrieved literature several topics result commonly at stake at present:

- 1) The **lack of a common regulation on organic wine-making** is the clearest, but it becomes much more differentiated among Member States when the contents of the future common regulation are dealt with. Consequently, a serious concern emerges on the level of detail the EU Regulation on organic wine-making should/may reach: considering the wide range of oenological practices very much related to climatic conditions but even more to tradition (that becomes a marketing tool) that differ from each other within European “wine” areas. This concern must be taken into consideration in the next project phases, especially in task 2.2 and task 5.1 as well as discussed in National Stakeholders fora and in European Project Advisory Committee (EPAC).

Considering that the debate on standards is timelier and lively on Internet pages than on “paper” publications an extra chapter has been added on such topic and related web-pages are added to bibliography list.

- 2) **SO₂ use and content in organic wines** is documented as a discussion issue but very few references were found dealing with the issue in a scientific perspective in the specific context of organic wine production. The majority of scientific papers report experimental work on SO₂ limits and alternatives in the broader context of “low input” wine making but no experience on organic grape. The same is true for other oenological alternatives that are proposed for testing in WP3 (lysozyme, ascorbic acid and other natural substances, techniques such as hyperoxygenation etc, yeast metabolism). The lack of experimental testing on organic grapes, in order to be able to take into account their specific composition and needs, confirms the need to run the complete experimental design as proposed in WP3, but the bibliography result will give basis for deciding priority and detail to be reached year by year.



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- 3) Similarly the bibliography reports few data concerning **secondary metabolites** specifically in organic grape and wine. Biogenic amines and ochratoxins (but also other ones) are commonly thought as “more risky” in organic production but no scientific data supports such a statement than turns out more as a prejudice than real state of facts. It will be important to further verify such statement in WP2 (large number of samples from organic wine awards), WP3 and WP4 (on-farm) and communicate it properly in WP5, though it might result as an important market issue (positively or negatively). On the other hand, reported observations concerning higher rates of resveratrol in organic fruit and grapes should be considered as a positive effect of organic farming on healthy aspects of wine consumption.

- 4) Several **agronomic impact factors** have been identified through the bibliographic survey, even if few of the scientific publications deals with organic grape production but with specific techniques or products used in organic farming. The lack of scientific data on the organic vineyard agronomic practices as a whole and its impact on wine qualities will be partially dealt with in task 2.3 and task 4.3, but a deeper evaluation is outside the scope of the project. Two important factors seem to be raised in all involved countries even if evaluated differently: 1) the use of resistant varieties and hybrids with potentiality and actual limitations; 2) the search for “authenticity” in organic wine that relies more in the vineyard management than in the cellar work.

- 5) **Consumers perception** results to be widely different in Member States but a general need of a more complete definition of “organic wine”, besides a positive additives list, is expressed. What is expected is a higher link to terroir values (even if not completely explained), local and heritage varieties, traditional processing (natural yeast vs. selected yeast; natural closures vs. synthetic ones). This must lead to elaborate a whole concept of organic wine to propose to stakeholders in order to reach a consensus on its meaning. This will influence the whole project and will affect the regulatory recommendations as well as the communication advised strategies.



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4 National focus

4.1 France

The private FNIVAB standards for organic wines, which have been elaborated from 2000 through a consensual way involving both national (FNIVAB –national federation for organic wines- and ITAB) and regional levels (regional groups of organic winemakers), are promoting in all production areas, and being applied in 2006 in 5 of them (Languedoc, Bordeaux, Loire, Bourgogne, Provence). Managed directly by FNIVAB, their control is made by the same certification bodies than those for vines. Even if certain small groups (Nature & Progrès, biodynamic) ask for stricter standards, the FNIVAB ones are considered as the most suitable common base at national level. They are also promoting by BIOCOOP, the main wines purchaser for organic shops. In this context, the decision, taken in 2005 by the French Ministry of Agriculture, of allowing the AB logo use in labelling for all wines certified from organic grapes, without any kind of specific rules for processing, appears as a marketing failure.

Other debates concern the requirements for a balanced development of the organic wine sector, considering the difficulties on the general wine market, and the cruel lack of communication means and supports. Nevertheless, the best quality of organic wines is recognized by an increasing number of authors, as their current good quality/price level. The good results obtained by organic wines in several awards (better proportion than conventional wines) show these performances and stimulate the market.

Off course, the organic wine sector is concerned by the current debate on the changing of oenological practices and the future CMO reform. Organic wine makers are frequently involved with their colleagues claiming for a “natural” and traditional approach of wine making in France in fights for defence of the “vins de terroir” specificities, instead of industrial products as mostly made in the New World production countries. Several groups are active in this way, such as “Terres et Vins du Monde”, “la Renaissance des Appellations” (Biodynamists) or SEVE. They are all involved in the national debate concerning the future of the AOC classification system.

4.2 Germany

From the beginning of the organized organic wine-movement the debate about organic wine making practices was focused on quality as well as environmental and energy requirement aspects. In these case some additives like ascorbic acid, sorbic acid and



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wine making practises with high energy requirement (flash pasteurization, cross-flow filtration) were forbidden under the first organic wine making rules. It depends on increasing quality aspects compared to conventional produced wines more and more technologies and additives/co-adjuvants were allowed in organic wine making according to the common wine regulation. There was no debate about the use of sulphur; it is accepted as a traditional way of wine making. In the last years the debate is more focused on “new” oenological practices like lysozyme, wood chips or most concentration and their effect on organic wine styles and terroir. But that is similar to the official debate in Germany about “Reinheitsgebot” “wine purity regulation”. In the last two years a “new traditional” way of wine making practises without modern technologies, selected yeasts or bacteria, no additives but extended lees contact as an antioxidant became more and more influence on organic wine making – coming from high quality as well as bio-dynamic wine makers.

There is no specific research done by organic wine making practises depends on the very small difference between conventional and organic wine making practises in Germany.

4.3 Italy

In the last two years the debate (quite intense on Internet tools too) is focussed on the contents of a commonly desired regulation on wine making. In such a debate the bio-dynamic practices and concepts have large space and result to be more appealing for consumers as well as for newly converted wine producers. Differently from other countries consumers’ point of view are not focussing on price differences or “expected” qualities of organic wine but more on “values” organic wine may include: respect of tradition, terroir, vocationality and all what may link it to authenticity. For example high intensity of debate has been caused by EU Commission decision to allow wood-chips in wine-making, high attention is given to historical background of wine making, for instance used materials.

At the same practically no scientific work has been carried on organic wine making as a whole, but only on specific techniques or problems that may be used/happen in organic wine as well as in conventional one. As well, no scientific work on bio-dynamic wine making.



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4.4 Switzerland

For years, the regulation of national labels is a strongly discussed topic in Switzerland. In this continuous debate, a large spectrum of diverse opinions can be observed, actually focused on reverse osmosis and mash heating. The guidelines/directives of the different labels are regularly reviewed and therewith in a dynamic process: i.e. DELINAT is now overworking the whole directives, BIOSUISSE is developing a legal instrument to hold responsible the originator of pesticide draft and FiBL adapts its “List of Adjuvant” every year.

Organic agriculture in general is boosted by several organizations which organize PR and courses for farmers. Recently, bio-dynamic wine production is becoming more and more important in Switzerland as many farmers are converting to bio-dynamic production. The reason for this trend is the farmers growing awareness of environmental problems and their responsibility for landscape and ecology. The main topics of interest, especially in viticulture, are the conservation of the soil fertility and an enhancement of biodiversity.

The debate among producers is mainly focused of production safety and quality issues and especially on plant protection and fertilization. Not only organic but also conventional producers more and more start to use modern and alternative wine production and processing techniques, as for example resistant varieties. For all wine-growers, but also for the consumers, the “Terroir” becomes a very important point in assessing the wine quality. The main topics of scientific research are the reduction of copper in grape production and reduction of plant diseases.

Regarding the Swiss wine trade, the internet dispatch has become an important market channel besides direct sales from wineries and sales via retailers. What lacks in Switzerland is a serious internet platform, i.e. in a public forum, where the “organic wine community” could express and exchange its opinions and views.

In contrast to other organic products as vegetable and fruits, consumers seem to be less motivated to buy organic wine of Swiss origin. Therewith, the Swiss “Organic Wine Market” is still in development and by far not saturated. The grape variety and the wine quality are predominant buying criteria.



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AROPUR®C.D.W. AROPUR-Systeme.

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3) Comportement physiologique et microclimat des grappes.

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Appendix I: Guidelines for literature survey

LITERATURE REVIEW ON ORGANIC VITICULTURE AND WINEMAKING			
Author(s)			
<i>Institute/organization</i>			
Original title			
English title			
Document language			
Reference			
Contact author			
Year of publication			
Type of publication	<input type="checkbox"/> scientific <input type="checkbox"/> technical <input type="checkbox"/> other	Wich area does it belong to?	<input type="checkbox"/> 1 (standards) <input type="checkbox"/> 2 (oenology) <input type="checkbox"/> 3 (agronomy) <input type="checkbox"/> 4 (consumers)



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Key words				
Is it reporting: <input type="checkbox"/> research results <input type="checkbox"/> stakeholders opinions <input type="checkbox"/> requests		<input type="checkbox"/> open problems/questions <input type="checkbox"/> legislative facts/proposals <input type="checkbox"/>		
Short summary				
Copy (in case of gray literature)				



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