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LALLEMAND

WINEMAKING UPDATE

Number 2 – 2012

LALVIN uvaferm ENOFERM

NEWS FLASH

- The **Lallemand Wine APP** is a new, easy-to-use tool for selecting the appropriate yeast, bacteria, nutrients, specialty inactivated yeast and enzymes for winemaking, and features a comprehensive catalogue of Lallemand winemaking products available in North America. A search engine is included with the app to help winemakers narrow down the products based on such specific parameters as potential alcohol, nutrient status, varietal, etc. The **Lallemand Wine APP** also includes the malolactic fermentation feasibility table, which helps winemakers determine whether their wine is suitable for MLF. You can download the **Lallemand Wine APP** from the **Apple® App Store**.
- Our **Reduless®** product is are now listed and complies with the *OMRI Standards Manual* and the *OMRI Policy Manual*, which are based on the requirements of the USDA National Organic Program Rule (7 CFR Part 205). **Reduless®** is a unique yeast-derived product with immobilized copper, developed to reduce sulphur-compound off-flavours and improve wine quality. **Reduless®** reduces levels of hydrogen sulphide, diethyl sulphide, dimethyl sulphide, mercaptans and other sulphur-related off-flavours in wine.

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WINEMAKING UPDATE is published by Lallemand to inform oenologists and winemaking staff about the latest news and applications arising from research. To request previous issues, or to send your questions or comments, contact us at:

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Rosé Fermentation

In 2006, the world production of rosé wines was estimated at 21.5 million hL – 9% of the total world production of wine (Aigrain 2009). Production has been increasing for several years. In the United Kingdom, for example (figure 1), the main sellers are rosé wines from the United States – almost half of the total wines sold in supermarkets.

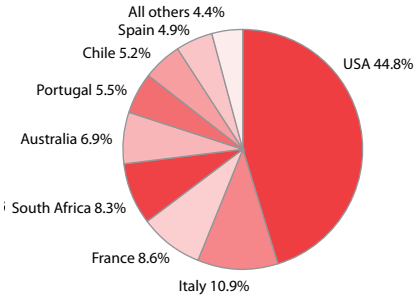

Figure 1. Contribution of country of origin to rosé wine sales (Nielsen 2011)

From a technical point of view, the production of rosé wine involves particular considerations as rosé is mid-way between white wine (avoiding the extraction of phenolic compounds at the tannin level) and red wine (involving potential problems with colour extraction and structure). When short maceration times are used in the production of high quality rosé wines, the wines can be fragile and evolve rapidly. One of the most frequent developments is the appearance of premature lactic and creamy aromas that can override the fruity aromas in the nose and the refreshing sensation in retronasal perception. This issue of *Winemaking Update* focuses on some points to consider during fermentation.

1. The yeast effect

Various volatile compounds originating in the grape and during fermentation are responsible for the fruity component in rosé wines. The technical decisions made in the winery can favour one or another of the compounds. Therefore, the winemaker can direct the results through the choice of techniques, input and equipment, so the sensory quality of the wines meets the needs of different markets.

When found in balanced concentrations, terpenoids, fatty acids, ester, thiols, diacetyl, damascenone and octalactone are considered positive molecular compositions for attaining the right rosé wine aromas. In low concentrations, diacetyl may enhance red fruit aromas, especially strawberries, sought after in fresh, international rosé wines. Sulphur compounds and molecules responsible for the vegetal characteristic in wines radically shorten the useful commercial life of rosé wines.

The fermentation conditions, including active dry yeast, temperature and activators, modulate the development of the various compounds. In a study done by Dumont et al. (2011) where different yeasts were used to ferment rosé from three different regions (France, Spain and Portugal) under controlled conditions, it was shown that the yeast utilized significantly influenced the profile of the wine. The goal of the project was to produce rosé wines and ensure their longevity by enhancing certain sensory compounds associated with varietal aromas, primary fruit and fresh aromas, thereby reducing the sensory descriptors (e.g., dairy, creamy, reduction and vegetal) that mask or decrease the impact of the desired compounds. The three yeast studied were the **Lalvin ICV GRE®**, **Lalvin ICV Opale®** and **Lalvin Rhone 4600®**. All three are frequently used for rosé winemaking. In this trial, the **Lalvin ICV GRE®** was found by all the tasters to be the optimal biological tool for producing rosé wines with longevity that best correspond to the profile defined – with fresh fruit, ripe fruit and nut aromas and excellent mouthfeel. The wines fermented with the **Lalvin Rhone 4600®** yeast were appreciated mainly for their

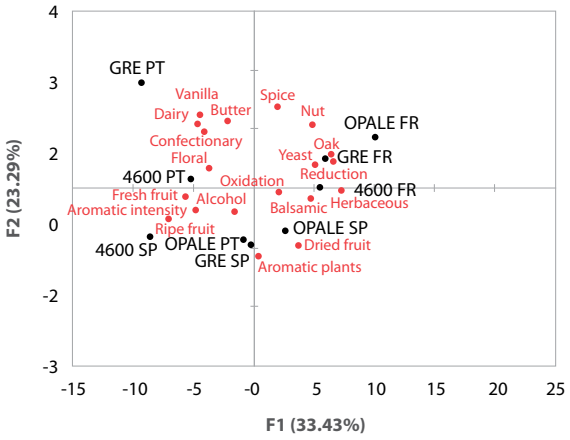

Figure 2. Biplot of the aroma descriptors and the correlation to the rosé wines from principal component analysis representation

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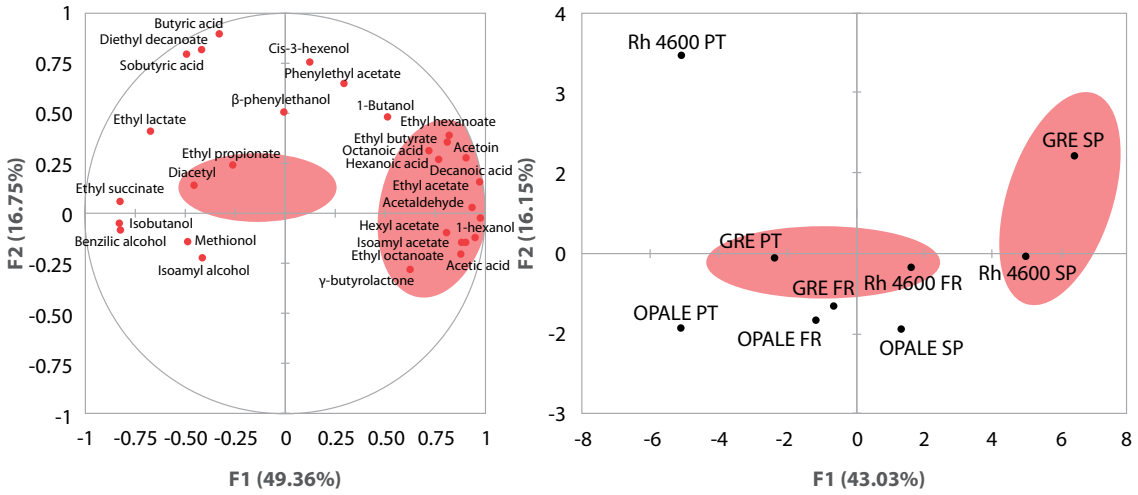

Figure 3. Principal components analysis representation of the wines produced and their correlations with major aromatic composition

volume and acidic mouthfeel, and the fresh retronasal sensations, as well as for the dried fruit, balsamic, butter and dairy descriptors. In comparison, the wines fermented with the **Lalvin ICV Opale®** were described as having aromatic plant, floral, herbaceous, spice and yeast descriptors. Interestingly, the wine clusters (figure 2) reflected the country of origin more than the selected yeasts utilized, showing that the *terroir* has a stronger impact than the yeast.

Figure 3 shows the major aroma compounds for all the rosé wines from the different regions and fermented by the different yeasts tested. The colored areas represent the wine samples preferred by the tasters, according to the desired profiles. In terms of major volatile components, diacetyl and ethyl propanoate were found in one area of preference, and the fatty acids, ethyl esters and γ-butyrolactone in another.

One of the trends in modern winemaking is to run rosé fermentation at low temperature, which, in principle, would produce more aromatic wine. A study carried out on the impact of temperature and yeast utilizing **Lalvin Rhone 4600®** and **Lalvin ICV Opale®** demonstrated that while there is no general rule on whether fermentation temperatures should be lower to obtain a more aromatic wine, the wine style can indeed be modulated with the appropriate temperature/yeast combination. For example, if the objective is to avoid amylic notes, fermentation with **Lalvin Rhone 4600®** should be carried out at about 18°C. But with **Lalvin ICV Opale®** the amylic notes will not be strongly influenced in the 14 to 18°C range (Pillet et al. 2011). It would also seem that, for both yeasts, fermentation at lower temperatures tends to favour a lactic character in the sensory evaluation, which is to be avoided in rosé wines.

2. Impact of specific inactivated yeast

It is now known that specific inactivated yeast (SIY) rich in glutathione helps protect the quality of white and rosé wines against the oxidation phenomena responsible for browning and loss of aromas. This innovation was first introduced by Lallemand (Patent N°WO/2005/080543) in 2003. In a study done by Aguera et al. (2012) and previously discussed in *Winemaking Update #2 2011*, it was shown that with the addition of SIY enriched in glutathione, such as **OptiMUM WHITE®**, there was an impact on the stability of the aromas and volatile compounds, such as terpenes and esters as well as thiols.

3. Nutrition is key!

The fermentation conditions encountered during the vinification of rosé wines are often difficult. After racking, the turbidity of the juice is low and may lack sufficient growth and survival factors. Moreover, the temperature of the must is often low when the yeast is added and during alcoholic fermentation (AF). A nitrogen deficiency is a combination of several factors, and is notably linked to the yeast, whose needs can vary, and to the potential alcohol of the must. The required additions of yeast-available nitrogen (YAN) are calculated according to the yeast's needs based on the concentration measured in the must. The timing of the nitrogen addition affects the multiplication of the yeast and its cellular activity. The type of nitrogen (inorganic or organic or a mix of the two) impacts the yeast metabolism and aromatic compounds (whether positively or negatively) that are produced. If the winemaker does not know the initial nitrogen level, the best time to add nitrogen is at the end of the first third of AF or until mid-AF. In practice, in order to avoid encouraging an excessive yeast population, when the addition is large, it is recommended to divide the addition into two increments. The inorganic form of nitrogen is rapidly assimilated, but when added at the beginning of AF it can generate very high yeast population levels and induce deficiencies during fermentation. Additions made after mid-AF can generate sulphur off-odours as well. Complex nitrogen lets the winemaker obtain wines with a less chemical taste (with less isoamyl acetate), that are softer on the nose and less aggressive on the palate. Different strategies can be developed, but in every case the winemaker should add complex nitrogen at the start of AF and after mid-fermentation. The sensory impact is quite evident, as demonstrated by the descriptive sensory analysis of two Grenache rosé wines resulting from identical musts, but with additions of nitrogen in different forms (figure 4).

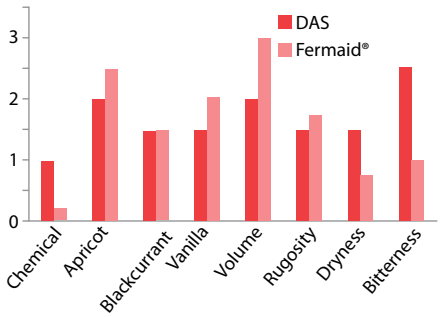

Figure 4. Sensory impact of nitrogen addition on Grenache rosé wines (R& D ICV 2008)

TO SUMMARIZE...

The aromatic expression of rosé wine is above all the reflection of the raw material. The varietal, the *terroir*, the climate and the growing conditions all play major roles, in particular on aroma precursors.

The quantity of aromatic compounds depends on the conditions of the alcoholic fermentation. First, the selected yeasts available are sufficiently varied to adapt to the potential of the raw material and the sought-after wine profile. Properly selecting the yeast is crucial and should be based on the fermentation conditions and the wine style desired. Our research has shown the various potentials of several selected yeasts for rosé winemaking. The use of a yeast protector, such as **Go-Ferm Protect®**, is necessary, especially when the must has been clarified and is low in survival factors. Proper nutrition management with complex nutrition (the **Fermaid®** line of nutrients) will help the winemaker obtain clean and complete fermentation. Lastly, specialty inactivated yeast rich in glutathione, such as **OptiMUM WHITE®**, is an essential tool for stabilizing aromas and colours in rosé wines. Please consult your Lallemand representative to select the best tools for your specific needs. *References available upon request*.