Press wine improvement through an early and appropriate fining

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INTRODUCTION

In red winemaking, press wines account for a significant part of the volume. Beside the quantitative aspect, these wines have qualitative aspects that winemakers can benefit from by blending them with free run wines. Rich in phenolic compounds and in color, press wines bring roundness and volume to the blend, therefore nicely complementing wines that may lack structure.

Improvement of red press wines in the blend is common, yet it is not an easy practice. It requires trials and tasting because the press wines are expected not to: a) unbalance the polyphenolic structure and bring a perception of green character, b) have a negative impact on the wine clarification, c) unbalance the color stability and d) contaminate the free run wine with spoilage micro-organisms.

In many cases, press wines are aged separately and added only during final blending, generally after a filtration. This practice can be optimized, for many reasons: an early blend ensures that free run and press fractions meld best in terms of length in mouth and final wine structure. Additionally, filtration addresses immediate clarification concerns, but it can also lead to serious stability issues on complex matrices like a press wine, the filtration can retain protective colloids and therefore increase the colloidal instability of the filtered wine.

In order to optimize the integration of press wine, trials of early fining have been performed just after pressing. These projects include microbiological analyses, turbidity measures, intensity and stability of coloring matter evaluation, as well as astringency and organoleptic perception of the wines. **POLYMUST AF®** stands out in these trials as a very effective tool in many regards.

MATERIAL AND METHOD

Over 2008, 2009 and 2010 vintages, several dozen press wines from different origins have been collected right after the press. These press wines were treated in some cases with enzymes, with a glucanase and pectinase preparation (**EXTRALYSE®** at 100ppm) then treated with different fining agents, including **POLYMUST AF®**.

Fining trials have been designed in duplicate with an action time of 2 weeks at 68°F. At the racking, wines were analyzed from a microbiological standpoint, as well as turbidity, color (intensity and stability), astringency and tasting evaluation.

Coloring matter stability has been determined by a cold test (SARCO method) and astringency has been quantified by an innovative method based on the electrophoretic measure of residues of salivary proteins after interaction with wine. Results are expressed in a percentage call SPI (Saliva Protein Index), which characterizes the wine astringency level. The higher the index, the higher the perception of astringency of the wine.

RESULTS

Impact of fining on microbial spoilage prevention

The general frame, unrelated to the fining agent used, is that we see a significant reduction of microbial load after fining. With medium rates of gelatin or other fining agent (including **GECOLL® SUPRA**, **POLYMUST AF®**), *Brettanomyces* populations are reduced by up to a thousand fold. In more affected wines (with a population close to 10^5 eq UFC/mL after the press), fining can bring the population down to below the threshold of 10^3 eq UFC/mL critical in volatile phenols production. The reduction in *Brettanomyes* population is even greater when the wine is previously treated with enzymes (**EXTRALYSE®** at 100 ppm) right after the press (Figure 1). The enzyme probably has no direct effect on viable *Brettanomyces* present in the wine, but by stimulating other yeasts autolysis, it optimizes the cell flocculation as well the lees compaction and hence their elimination at racking.

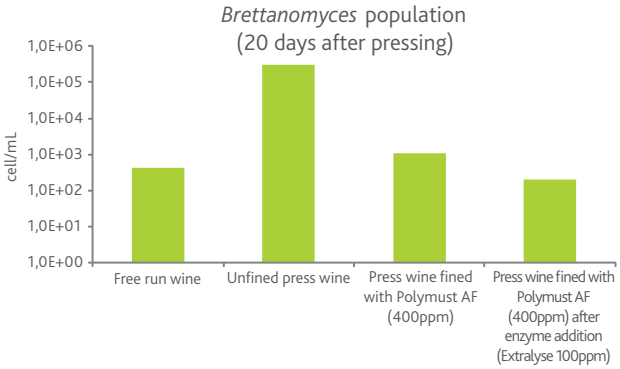

*Figure 1 : Effect of the **EXTRALYSE®** enzyme and the **POLYMUST AF®** fining agent on the Brettanomyces population (Press wine of a Grand Cru Classé of Saint-Emilion, 2010).*

The early fining procedure helps in reducing the spoilage population back to the level of the free run wine. To some extent, fining early contributes to balancing microbial populations between press and free run wines, where pressing has the effect of concentrating micro-organisms in the press fraction. The trials show that when press wines are treated with enzymes and fined just after pressing, these fractions do not contaminate the free run fraction. It is advised to perform these operations as early as possible in the aging procedure in order to leave time for all the other microbiological stabilization steps: racking, filtration, etc., so that the microbial load of the final blend is decreasing at each step until bottling.

Impact of fining on wine clarity

As Table 1 shows, different fining agents have different effect on wine's turbidity. **POLYMUST AF®** is proven to be effective as turbidity decreases by 30 to 40%. Here again, an early fining alone is not sufficient to reach a satisfactory result in clarity, but it considerably reduces the difference between press and free run wines to which it will be blended. The further aging steps will help progressively reducing the wine's turbidity until having a wine with the desired clarity ready for bottling.

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Turbidity (NTU)		
	Merlot	Cabernet-Sauvignon
Control : racked but unfined	190	270
Gelatin 6 cL/hL – 600 ppm	140	235
Polymust AF 15 g/hL – 150 ppm	110	210
Polymust AF 30 g/hL – 300 ppm	102	200

Table 1: Impact of different fining agents on press wines clarification (Médoc, 2010; measurement performed after racking)..

In the trial with the press wine of Saint-Emilion in 2010 (Figure 1), the addition of **EXTRALYSE®** (100ppm) then of **POLYMUST AF®** (400ppm) greatly reduced the turbidity from 115 down to 22 NTU.

Impact of fining on coloring matter stability

Regarding coloring matter, results show that **POLYMUST AF®** is also the best tool to keep the color level the most intense and stable.

In the trial described in Table 2 (Pauillac, 2011), **POLYMUST AF®** has significantly reduced the coloring matter instability, almost completely stabilizing the wine (Delta NTU≤2). **POLYMUST AF®** is more efficient in taking care of the instability than a gelatin, even at a high dosage rate. The bentonite fraction in **POLYMUST AF®** is responsible for the elimination of the unstable coloring matter, without affecting the protective colloidal content. To this extent, this kind of treatment is more efficient in the long term than a filtration, as shown in Figure 2.

	Stability of the coloring matter (Delta NTU, cold test)
Control racked but unfiltered	34
Gelatin 10 cl/hL – 1,000 ppm	24
POLYMUST AF® 60 g/hL – 600 ppm	9

Table 2: Impact of different fining agents on color stability of a press wine (Pauillac, 2011; measurement performed after racking).

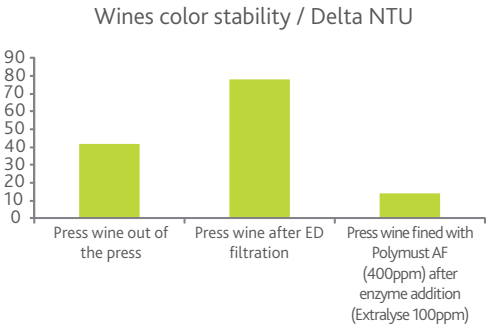

Table 2: Impact of different fining agents on color stability of a press wine (Pauillac, 2011; measurement performed after racking).

Impact of fining on organoleptic quality of the wine

As far as astringency is concerned, the following figure shows that **POLYMUST AF®** is again a very powerful tool to reduce the astringency index SPI: 35% decrease compared to the control. This reduction in astringency is confirmed by tasting results where **POLYMUST AF®** is ranked first (Figure 4) for both wines. The tasting panel unanimously noted the astringency reduction, but also the effect on green character perception and on the metallic taste often found in press wines. These positive side effects may be due to the PVPP fraction in the product.

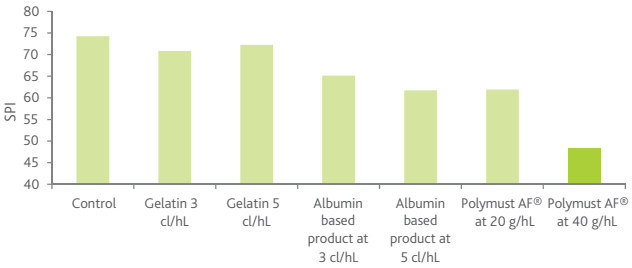

Figure 3: Effect of different fining agents on the astringency index (SPI), all reducing the wine's astringency.

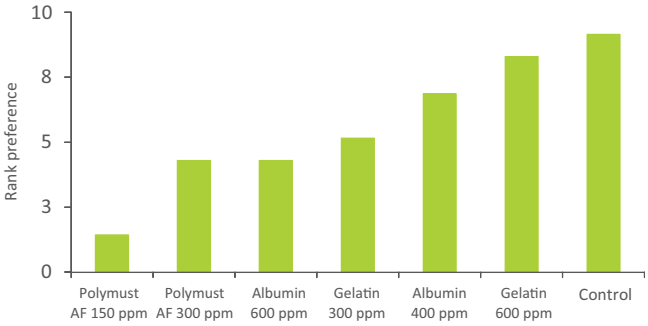

Figure 4: Tasting and preference ranking of press wines treated with fining agents of Merlot (top) and Cabernet Sauvignon (bottom) of Cru Classé of Pauillac in 2010.

CONCLUSIONS

Originally developed to offer an allergen free alternative product for white wine fining, **POLYMUST AF®** is shown in this study to be particularly well suited for press wine fining during red wine aging and blending procedures.

After fermentation (AF and MLF), press wines can be immediately treated with enzymes and then fined as early as right after pressing in order to be blended soon thereafter to free run wine. This is the best way to take advantage of press wine characteristics such as bright color, length and structure in mouth, while not jeopardizing microbial, polyphenolic and colloidal balance of the free run wine.

POLYMUST AF® shows very good results in terms of reduction of microbial load in press wine afterthe wine has been previously treated with an enzyme.

The most dramatic results concern the improvement in terms of clarification, color stabilization and perception of astringency and metallic notes in press wines. The wines fined with **POLYMUST AF®** have the quality necessary to be integrated to free run wine and participate in the sensorial improvement of the blend.

AS-VR-Oct. 2011

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