

OPTIMIZATION OF MICRO-OXYGENATION WITH LYSOZYME

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Introduction

Lysozyme will be used for the 5th harvest season. Even though it is used for semi-preventive or curative treatments of lactic spoilage in over 70% of the cases, numerous other applications have been developed.

Most of these applications take advantage of the bactericidal property of lysozyme to delay malolactic fermentation and to obtain wines with a more stable colour, but also an improved balance.

This article presents a practical application of lysozyme to increase the efficiency of micro-oxygenation in the Clairmonts wine cellar, near Tain l'Hermitage (26). (see photos at the end of the article).

After several years of developments, the utilization of micro-oxygenation combined with lysozyme has allowed the production of wines reflecting all the qualities of the Northern Côtes du Rhône Syrah (AOC Crozes Hermitage), while improving the mouthfeel. In this particular case, the returns obtained on the product have exceeded the investments (in efforts, materials and consumables such as oxygen and lysozyme).

Development and results

The addition of lysozyme to press wines at high rates and, if necessary, to the free-run (if microscopical evaluation revealed bacterial growth), has allowed the delay of MLF by several weeks during the 2004 vinification. The experimental protocol is displayed in Figure 1.

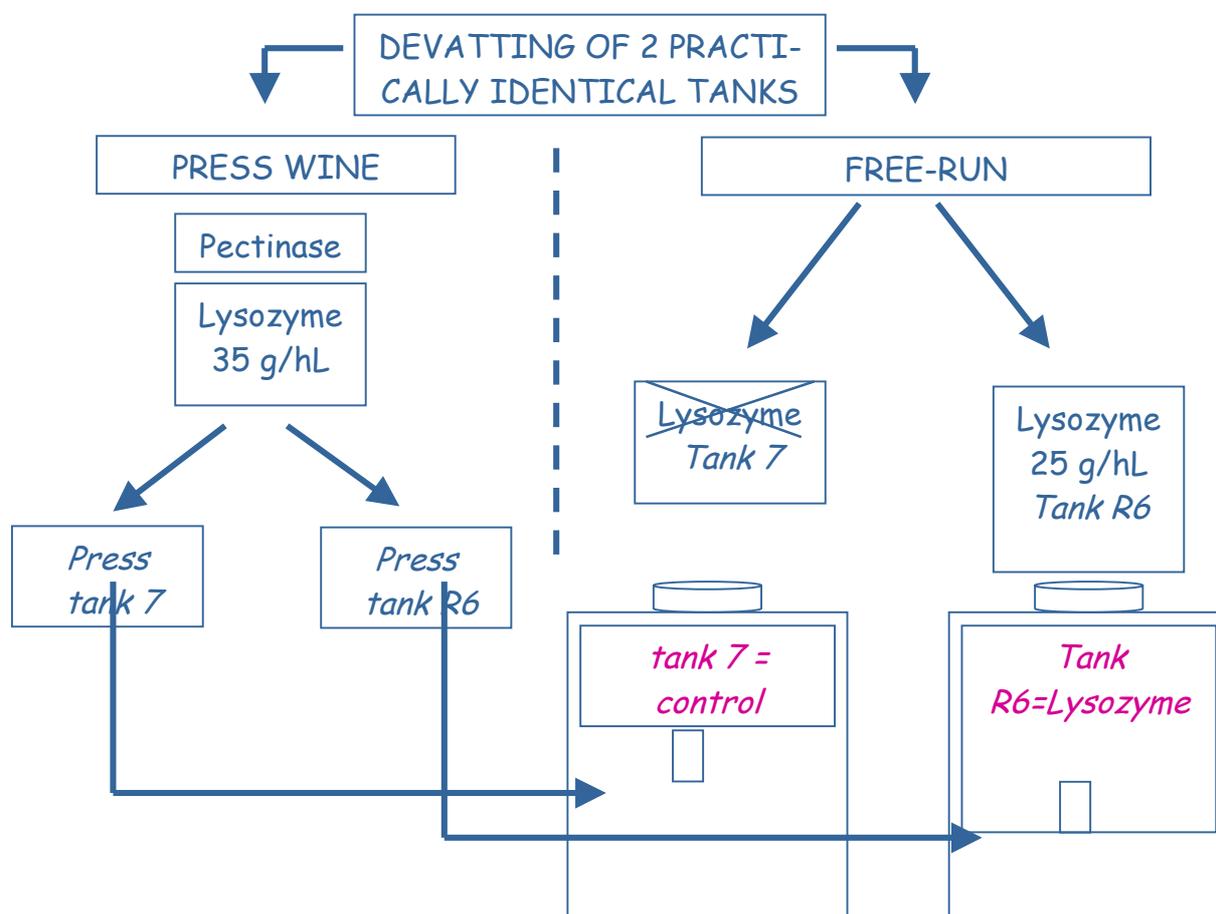


Figure 1: Representation of the experimental protocol

The delay of MLF (Figure 2a) has allowed completion of micro-oxygenation in the tank with lysozyme addition (Figure 2b) before MLF, whereas in the control tank micro-oxygenation was partly realized before MLF, and partly after MLF. The total oxygen additions were almost identical (30 cm³/l), but the phase during which the micro-oxygenation was performed differed between the 2 tanks.

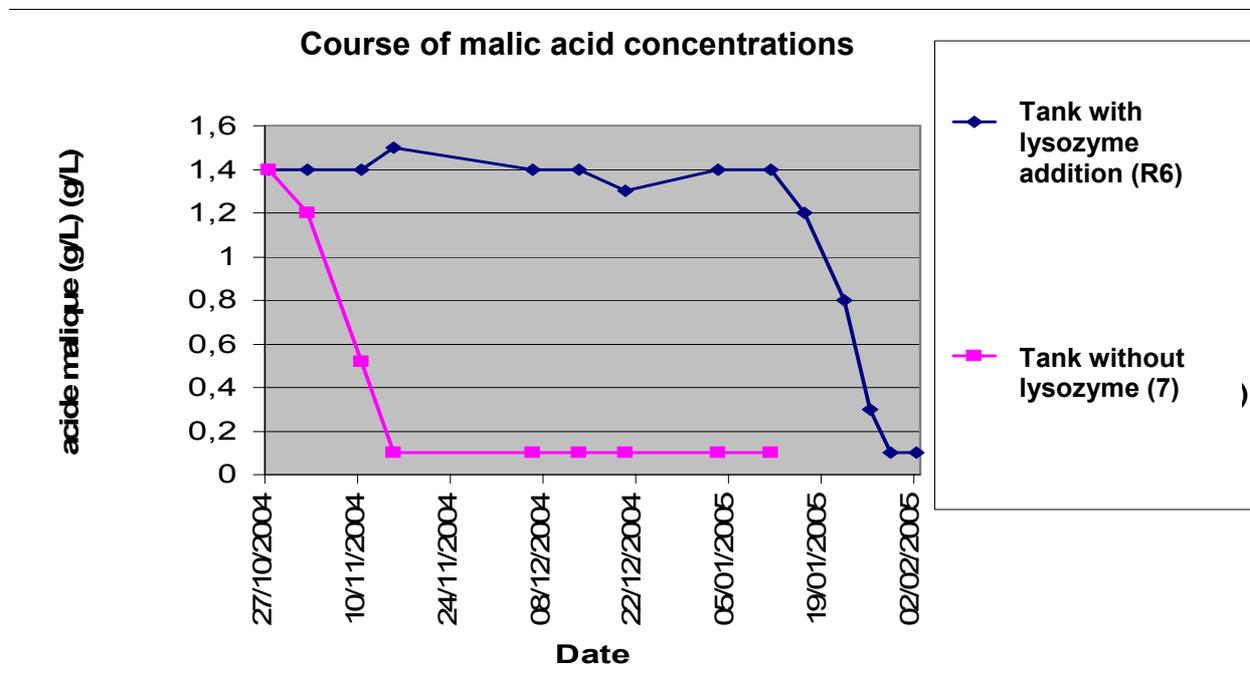


Figure 2a: Comparison of the course of malic acid concentrations

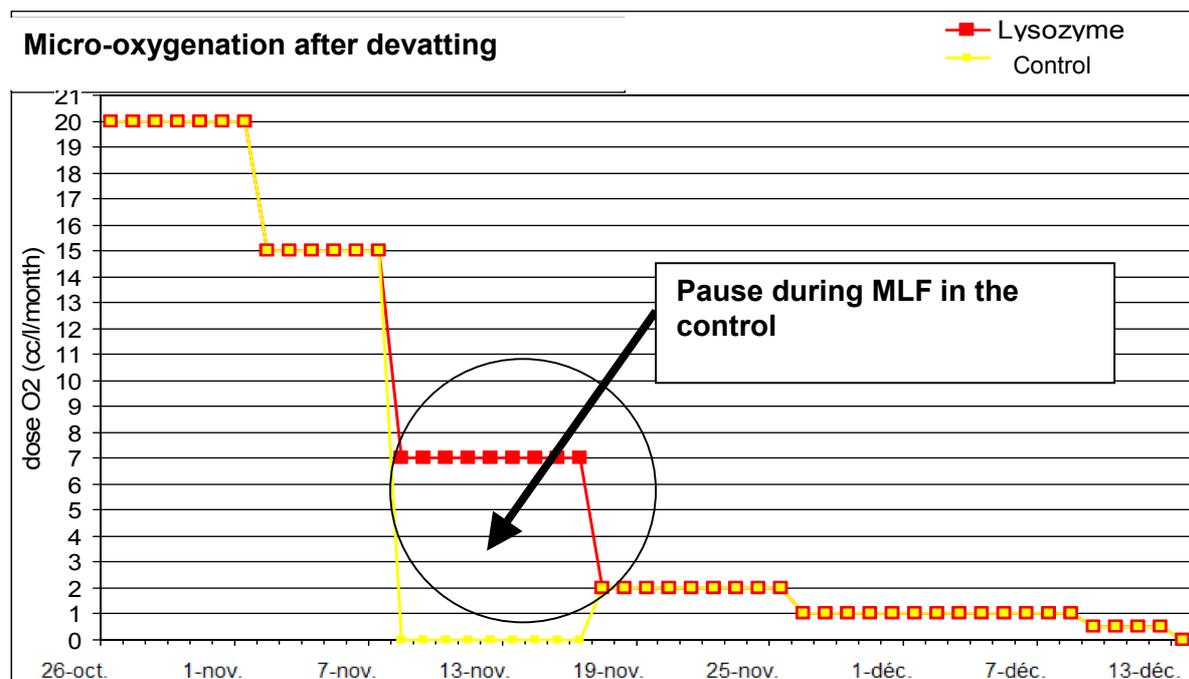


Figure 2b: Comparison of the micro-oxygenations

The choice of elaboration process had a clear impact on the quality of the tannins (Figure 3): these were rounder and less aggressive in the batch with lysozyme, which had completed its micro-oxygenation before MLF.

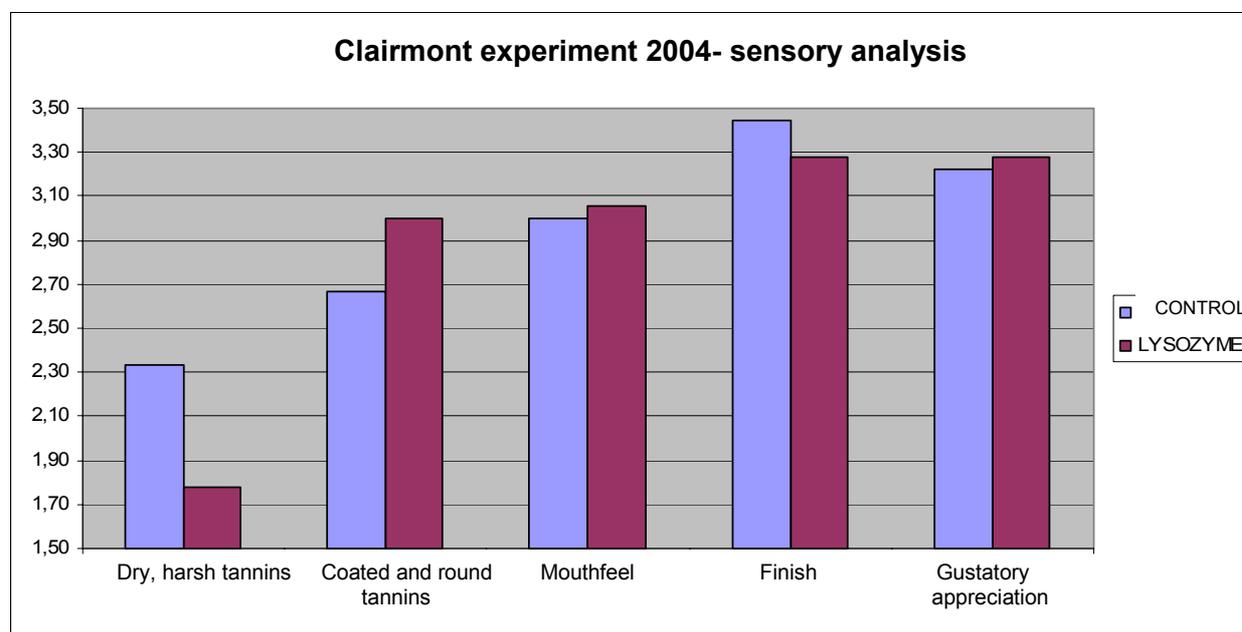


Figure 3: Comparison of sensory effect according to micro-oxygenation timing - 2004 vintage

This result confirmed the assessment of the winemaker (Jean-Michel Borja), as well as the remarks made by a panel of international experts, which had the opportunity to taste these wines in the past 3 months.

A similar effect had been observed with the 2001 vintage, where the difference increased over time, not only regarding the quality of the tannin structure, but also the stability of the fruit aromas. These differences explain the results of the preference tests performed in 2003 (Figure 4).

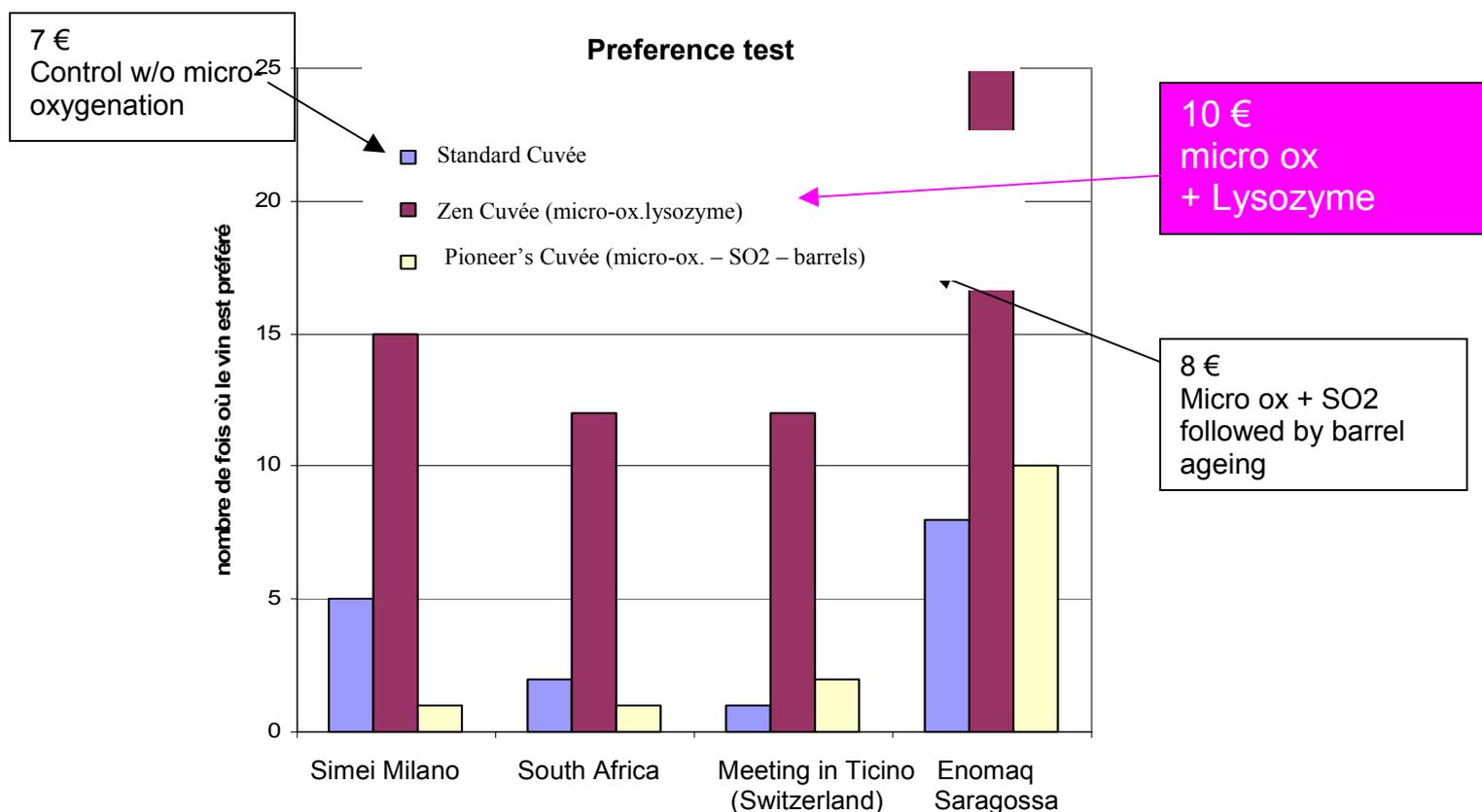


Figure 4: Preference tests with Crozes Hermitage 2001 wines. Impact of micro-oxygenation with or without SO₂, lysozyme.

y axis translation: Number of times the wine was preferred

The winery was able to valorize the wine style produced from the 2001 harvest by launching a special cuvée. This cuvée, while 25% more expensive, was sold rapidly and has been much appreciated: the cuvée was sold twice as fast that the ones produced from the 2 other treatments.

This example underlines the advantages offered by a technique, which may be more expensive (3€/hl for lysozyme and as much for the micro-oxygenation without considering the effort), but allows for a very attractive return (additional gross profit of 226 €/hl in this case). Even though it is difficult to increase prices in the actual economical context, a superior quality allows to sell wines more easily and, above all, earlier.

Of course, this technique has to be used in conjunction with a good communication and a quality approach starting in the vineyard, which is the case at the Clairmonts winery.

“Our objective is to obtain wines that are more fruity and full-bodied without being too heavy, and also to stabilize the colour” explains Jean-Michel Borja, the winemaker. “Generally, the micro-oxygenated cuvées are ready a little bit earlier, and are well appreciated. In addition, I value the possibility to safely induce MLF after micro-oxygenation, since it allows me to maximize the effects of micro-oxygenation without risking oxidation (the lactic acid bacteria will consume the residual acetaldehyde)”.



Jean-Michel BORJA, Manager and oenologist, Clairmonts winery (26)



Pictures of some installations at the Clairmonts winery