TECHNICAL BOOKLET

MANAGING WINES' ACIDITY

Acidity is an essential parameter that contributes as much to wines' balance as alcohol does. Each vintage is never alike, so it is important to spend time reflecting on how to manage the acidity of the musts and wines.

This booklet presents some of the solutions available to winemakers to best adjust the acidity of musts and/or wines.

DE-ACIDIFICATION

In vintages when the optimal maturity is hard to achieve, grapes are often high in acidity. In this case, it is common to find concentrations in malic acid higher than tartaric acid. Several solutions are available to winemakers to find a balance in the wines.

1. Biological de-acidification

Malolactic fermentation causes a decarboxylation of L-malic acid into lactic acid. This loss of an acid functional group results in a lower level of perceived acidity. Malic acid is a diacid, whereas lactic acid is a monoacid. The loss of acidity depends on the concentration in malic acid, and thus the grapes' maturity. It is known that the **fermentation of 1 g/L of malic acid decreases the total acidity by 0.4g/L H_2SO_4 equivalent**.

When biological breakdown of malic acid is desired, malolactic bacteria should be used (*Oenococcus oeni*, *Lactobacillus*). In delicate situations, selected commercial strains of malolactic bacteria can be used for reliable inoculation and large decreases in malic acid.

Type of inoculation

BACTERIA	EARLY CO-INOCULATION	LATE CO-INOCULATION	SEQUENTIAL INOCULATION	CURATIVE INOCULATION	PROTOCOL
Œno 1®	●●●	●●●	●●	●	**For co-inoculation, add directly without rehydration** In order to improve the distribution, rehydrate 15 minutes
Œno 2	●	●●●	●●●	●	12 hours (rehydration + acclimatization) with malolactic activator kit provided
Œno Xtrem	●	●	●●●	●●●	Add directly without rehydration. For difficult conditions (pH < 3,2 or/and TAV > 15%), add 30 g/hL of OptiML.

INOCULATION TIMING	24 - 48 hours after the start of AF	1010 density	AF completed or running off	Contact us
TECHNICAL OBJECTIVES	Save time, avoid alterations	Save time, ensure the traditional process AF	MLF after AF - MLF in barrel	Sluggish MLF – restarting MLF

Certain conditions are detrimental to the metabolism of malolactic bacteria (low pH, high ABV, total SO_2,...). To ensure the fermentiscibility of your wine, consult our decision-making tool on ŒnoSolutions.

Biological de-acidification can be insufficient or not desired by the winemaker. In this case, the only option is chemical de-acidification.

2. Chemical de-acidification

The tree following substances can be used for chemical de-acidification:

- Neutral potassium tartrate: not widely used since its usage is restricted. 2.5g/L of neutral potassium tartrate decreases the acidity by 1g/L (sulfuric acid equivalent).
- Potassium bicarbonate
- Calcium carbonate

It is best to de-acidify wine because must de-acidification is more difficult and less precise.

The different products and their uses:

	ACTION	REGULATION			IMPACT		TIPS
		ORGANIC	BIO-DYNAMIC	NOP	POSITIVE	NEGATIVE	
CALCIUM CARBONATE	1 g/L removes 1 g/L of acidity (expresses in sulfuric acid)	YES	NO	YES	Predictable impact Easy to use (leave space in the tank)	Adds calcium	Remove a few hectolitres from the tank because the product causes effervescence
POTASSIUM BICARBONATE	≈1,5 g/L removes 1 g/L of acidity (expressed in sulfuric acid)	YES	YES (under derogation)	NO	Predictable impact Easy to use (leave space in the tank)	Later precipitations should be taken into account*	Remove a few hectolitres from the tank because the product causes effervescence. Easy to use due to its solubility and release of CO_2 which helps give good homogenisation.

**because of later precipitations due to cold, the decrease in acidity is often 1.5 times more than the theoretical decrease. .*

NOTE ON LEGISLATION (ARTICLE V OF THE EUROPEAN COMMUNITIES OFFICIAL JOURNAL)

- De-acidificatin possible on: fresh grapes, grape must, partially fermented grape must, new wine still fermenting, and wine.
- De-acidification on must can be done just once, without a limit of the dosage, before 1st January following the fermentation.
- De-acidification can be done one or several times, with the cumulative maximum limit of 1 gram per litre expressed in tartaric acid, for the whole year.

ACIDIFICATION

During certain vintages, the musts show an imbalance in acidity, with low levels of malic acids and high pHs. An addition of acid on the must and/or wines can be made to correct this imbalance. There are several benefits:

- Increase in total acidity
- Improvement of sensory aspects
- Better chemical and microbiological stability
- Improvement of colour of red and rosé wines
- Easier start of MLF

Acidification is a practice subject to authorisation, according to the climatic conditions and the production area.

The different products and their uses:

	EU MAXIMUM LEGAL DOSAGE EXPRESSED IN TARTARIC ACID		REGULATION			IMPACT		
	MUST AND WINE IN FERMENTATION	WINES	ORGANIC	BIO-DYNAMIC	NOP	ORGANOLEPTIC	pH	TA
TARTARIC ACID	1.50 g/L	2.50 g/L	YES	YES (under derogation)	YES	Lively character, Drying/Hard	+++	++
D-L MALIC ACID	1.34 g/L	2.20 g/L	NO	YES	YES	Freshness of white and rosé wines, Curative on red for MLF start, Greenness, Risk of unwanted MLF start	++	+++
LACTIC ACID (88%)	1.8 g/L or 17cL/hL	3 g/L or 28,2 cL/hL	NO	NO	YES	Soft acid, Does not precipitate	+	+++

OBLIGATIONS THAT ARE COMMON TO THE TWO OPERATIONS

Acidification and chaptalisation, aside for derogation (to be decided on a case by case basis) are mutually exclusive. Acidification and de-acidification of the same product are mutually exclusive.

The declaration of de-acidification and acidification must be made with the mention of:

- the name and address of the declarant
- the nature of the operation
- the place where the operation will occur

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