

2004, Low maturity level.

In Europe, this 2004 vintage is characterized by a lack of sun, rain and a heavy crop, as many parameters that contribute to insufficient maturity. Although this situation presents several advantages such as a good level of acidity, easily managed fermentations it mainly has downsides: low potential alcohol, high pectin content, low levels of anthocyanins and polyphenols. To manage this situation, DSM technical service team proposes some advice.

General comments

■ **Maturity check**

Extra care should be given to maturity check in order to accurately estimate grape sugar and acid content.

- Collect several bunches.

The maturity of each berry within a bunch might be heterogeneous and results might be misevaluated with the 200 berries method.

- Taste the berries.

Evaluate skin astringency and seeds browning.

■ **Sugar level correction**

- Adding rectified grape juice concentrate

Grape juice concentrate can be added by a simple pumping.

The following formula allows to determine the volume V (in HI) of grape concentrate required to reach the targeted level of alcohol in a volume V1 (in HI) of grape must.

$$V = V1 * (TA - IPA) / (GPA - TA)$$

TA = Target Alcohol.

IPA = Initial Potential Alcohol.

GPA = Grape concentrate Potential Alcohol.

- Adding sucrose

White sugar dissolved in grape must is incorporated to the tank with a pump.

The following formula allows to determine Q (in Kg) the sugar quantity required to reach the targeted level of alcohol in a volume V1 (in HI) of grape must (16,5 g/l for 1 degree of 'alcohol).

$$Q = V1 * (TA - IPA) / 1,65$$

V1 = Grape must to be treated in hl

The sugar or grape concentrate addition should take place in the first half of fermentation, in the active phase, (before density 1040 or 16 to 18 Brix). A sudden raise in temperature might occur, therefore, the cooling system must be ready in order to absorb a temperature shock and avoid stuck fermentations.

■ **De acidification**

Lowering the acidity level allows an increase in wines mouth feel and eases malolactic fermentation onset.

- **Chemical Desacidification** : tartaric acid salts precipitation.

Calcium carbonate is the preferred salt as it is easier to dose and more precise than potassium bicarbonate.

1 g/l of calcium carbonate allows lowering the acidity by 1 g/l. (around 0,65 g/l for potassium bicarbonate)

- **Biological deacidification** : malic acid consumption.

Use yeast that metabolize malic acid.

Fermivin®, metabolizes 20 to 30% of the total malic acid and therefore eases malo lactic fermentation onset.

Use selected malo lactic bacteria. Prefer low pH friendly strains.

In order to start malolactic fermentation an ML starter should be prepared with some deacidified wine.

Sugar addition and deacidification are subject to local regulation.

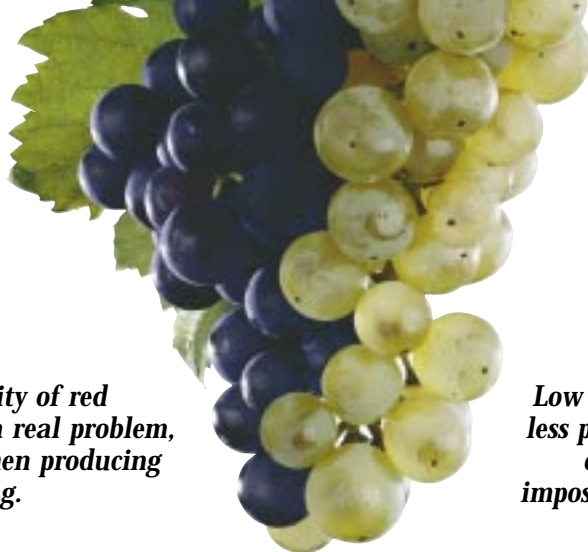
■ **Sulfur addition**

At low pH, SO₂ remains free for the most part and very active to protect the wine against bacteria development.

- **Lower SO₂ doses.**

3 to 5 g/hl of SO₂ will allow to have less than 50 mg/l of total SO₂ total at the end of alcoholic fermentation to avoid malolactic fermentation inhibition.





Red grapes

The low maturity of red grapes can be a real problem, particularly when producing wines for ageing.

■ Handling phenolic maturity deficiency

The challenge is to extract a maximum of color without extracting harsh tannins.

- De-stemming and de-seeding
Seeds can also be removed during maceration.
- Favor pre-ferment maceration techniques.
High temperature...
- Increase the pomace/juice ratio
Remove juice after 12 to 24 h maceration according to the variety.
- Prefer short macération
6 to 8 days maximum
- Use extraction enzymes
Rapidase® Ex-Color 3 g/100 kg.
Its concentrated pectinases and hémicellulases activities optimize phenolic components extraction.
- Ferment at high temperature 28 to 30°C.
- Use adapted yeast strains.
Fermicru® VR5, Anchor® NT50, Fermicru® UY4, Fermirouge® (20 g/hl.)
- Avoid intensive must movements in alcoholic phase.
Ban delestages, favor punch downs and pump overs with air. (especially when green seeds are still present)

■ Color stabilization

- During fermentation.
Add proanthocyanidic tanins (grape) alone or in combinaison with ellagic tannins (quebracho...)
30 g/hl of Tanin, 3 days after fermentation onset, favors anthothianin combination and protects them from oxidation.
- During ageing.
Use micro oxygenation, it allows for anthocyanin and tanin combination and softens the wines phenolic structure.

White grapes

Low maturity of whites is less problematic than that of red grapes but still imposes a few precautions.

■ Improve pressing and settling.

The pectin content of low maturity grapes is naturally quite high. The pectin electrostatic and gellifying properties maintain particles responsible for haze in suspension and lower juice yields.

- Use pectolytic enzymes.

At pressing:

RAPIDASE® X-PRESS (2,5 g/100 kg), added at the crusher or during skin contact, allows a free run juice yield increase and eases pressing and clarification.

At settling and clarification:

RAPIDASE® CB (3 g/hl) used after pressing breaks down pectin long chains and allows for fast clarification and compact lees settlement.

■ Preserve the aromatic profile

A lack of maturity does not mean lack of aroma. Low maturity grapes can have an interesting aromatic profile when green and vegetal characters can be avoided.

- 100% destemming.
- Skin contact.
- Regularly taste the must during pressing.
Taste the P4 et P5 before incorporating them to the tank.
- Reveal grape aroma.
Yeast *Fermicru® 4F9, Fermicru® LCVB* (or *Fermivin®* to preserve varietal aroma)

■ Enhance organoleptic balance during ageing

- Ageing on fine lees.
This will bring mouthfeel and balance to your wines.
Rapidase® Filtration 3 à 5 g/hl for 3 weeks, after fermentation.
Pectinases and beta-glucanases preparation used to speed up the natural yeast autolysis process.