

Winemaking with grapes affected by *Botrytis cinerea*

Botrytis cinerea is a weather driven fungus which causes the grapevine diseases botrytis bunch rot and grey mould.

The ideal conditions of its development are humidity, high crop density, and important vegetation development with the following consequences:

- Poor juice yields.
- Low must nitrogen and vitamins content, due to the consumption by *Botrytis cinerea* for its own growth.
- Unwanted microorganism development due to grape berry cell walls degradation.
- Must browning and oxidation by botrytis polyphenol oxydase: laccase.
- Filter clogging by Botrytis glucans.

GENERAL RECOMMENDATIONS

- Minimise the quantity of mould-affected fruit at harvesting.
- Add more sulfur dioxide (SO₂) than usual due to the increased risk of oxidation from laccase and to limit population of other unwanted microorganisms.
- Bentonite fining to remove the laccase, PVPP to remove polyphenols.
- Tanins' addition allows minimizing oxidation by laccase at early stage.
- Vigorous yeast and nitrogen addition are necessary
- Beta-glucanases ease filtration and increase filter cycles.
- Lysozyme addition offers an additional security.

- Making white wines : In order to reduce the off flavors and eliminate the polyphenol oxydases, clarify severely and rack the wines as soon as possible. Used after pressing, pectinases break down long pectin chains and allow for faster clarification and compact lees settling.

- Making red wines : Reduce harvest manipulations to the minimum in order to slow down the damages caused by the laccase. Ban delestages, avoid puch downs, and prefer pumping overs. The use of enzymes promotes polyphenol extraction with less physical manipulations.
- With infected grapes, maceration duration must be reduced by 20 to 50%. Using extraction enzymes on red grapes will accelerate the release of phenolic compounds.

PROCESS *BOTRYTIS CINEREA* INFECTED WHITE GRAPES

- **SO₂** 6 to 8 g/hl. Avoid skin contact.
- **Destem, crush** and **Press** the grapes: Add 5-10 g/hl of Tannins at press loading.
- **Settling:** Avoid off flavors with a fast and severe clarification (<50 NTU) and avoid browning removing oxidable phenolic compounds.
 - Enzyme:** **Rapidase®Clear** at 30 ml/hl if rot < 20%
 - Rapidase®Batonnage** at 4g/hl if rot > 20%
 Use a **settling aid** like PVPP 20 g/hl. and bentonite 40 g/hl.
- **Fermentation :**
 - Vigourous and aromatic strains are recommended : Fermicru® AR2, Fermicru® LVCB, Fermicru® 4F9, Anchor® VIN13, Anchor® NT116, 20 à 25 g/hl.
 - Fermentation temperature must be < 20°C
 - Supplement the must in lacking vitamins and nutrients: Nitrogen, vitamins (thiamin). Add **Maxaferm®** at 20 g/hl.
- Treatments with **Rapidase®Batonnage** 3-5g/hL will allow the Botrytis glucan to be degraded, liberating the yeasts' polysaccharides which release sapid molecules and roundness.

PROCESS *BOTRYTIS CINEREA* INFECTED RED GRAPES

- **SO₂** 6 to 10 g/hl.
- Add 30-50 g/hl of Tannins (proanthocyanidic + ellagic). Keep the pre-fermentation phase as short as possible and exclude air.
- **Enzyme:** not at the same time as tannins or SO₂
 - Rapidase®Extra Ffruit** at 3 g/hl if rot < 25-30%
 - No enzyme** if rot > 30%
- **Fermentation :**
 - Vigourous and aromatic strains are recommended: Fermicru® VR5, Collection Cepage® Merlot, syrah, Anchor® NT50, 20 à 25 g/hl.
 - Supplement the must in lacking vitamins and nutrients: Nitrogen, vitamins (thiamin). Add **Maxaferm®** at 20 g/hl.
 - Short vatting 6-8 days max.
- From mid-fermentation or later, Treatments with **Rapidase®Batonnage** 3-5g/hL during mini. 3 weeks to degrade pectic polysaccharides (pectins et glucans) responsables for filter clogging.