



## Treatment Suggestions to Mitigate the Negative Effects of Powdery Mildew and Botrytis Infection in Juice and Wine

We have put together some treatment suggestions to mitigate issues in the winery with these two fungal infections. It's all about limiting the negative effects of unwanted yeast, mold and bacteria associated with powdery mildew infections and reducing Botrytis derived laccase activity and glucan presence.

### WHITE GRAPES

- **Vigorous sorting either in vineyard or crush deck**
- **Minimize crushing/destemming if possible**
- **50-100 mg/L SO<sub>2</sub> on fruit**
  - Vary dosage rate depending on degree of fruit break down and juice pH
  - SO<sub>2</sub> will not inactivate laccase, but will help minimize unwanted microbial populations
- **50-100 mg/L Gallic tannin (Galalcool/Gallovin) during press loading**
  - Reinforces antioxidant potential of SO<sub>2</sub>
  - Binds with enzymes and proteins present in infected fruit/juice
- **Low pressure pressing**
  - Clarification or beta glucanase enzymes during pressing to help with quick extraction off skins
- **Press fractioning**
  - The first couple hundred litres can have highest concentrations of laccase/glucans and unwanted microbes. Keep separate from remaining press fraction
  - Heavy pressing can be treated with the first couple hundred litres to reincorporate the infected juice to the main press fractions, or fermented and kept separately if infection is widespread
- **Limit O<sub>2</sub> contact at all stages to minimize oxidative enzyme activity**
  - Purging lines and tanks with CO<sub>2</sub>
  - CO<sub>2</sub> cover in sitting bins, press trays, tank ullage
  - Limit movements of cold must/wine
  - Fix leaking hoses and pumps to minimize O<sub>2</sub> ingress
- **Fine juice, settle and remove off lees quickly**
  - Clarification enzymes to aid in cleaning juice (Lafazym CL and Endozym Muscat are both amazing and rapid)
  - Beta-glucanase enzymes effectively break down glucan chains (Extralysse at 1-3g/hL, Endozym Antibotrytis or Glucapec 2-4g/hL)

**Oxidation prevention products are useful after enzyme treatments to prepare the juice for a healthy fermentation. Be aware that products containing bentonite will inactivate enzyme activity so should be added after any enzyme treatments are made.**

Combinations of PVPP, Casein, Bentonite, and Isinglass will effectively fine the juice to enable racking off the infected lees, prevent/treat oxidation, and remove unwanted proteins and laccase. (500-1000mg/L)

- **Polymust Press:** PVPP, Vegetal Protein, Bentonite
- **Polylact:** PVPP & Potassium Caseinate
- **Microcel:** Potassium Caseinate, Bentonite, Cellulose
- **Casei Plus:** Potassium, Bentonite
- **Catalasi AF Plus:** Bentonite, PVPP, Silica gel, Isinglass

**In addition, these products can also be used during fermentation to further extend oxidation protection**

- **Avoid indigenous fermentation**
  - High populations of spoilage microorganisms are present in the infected fruit and juice
  - Fast and effective management of unwanted yeast and bacteria through SO<sub>2</sub> additions and cold juice temperatures will minimize spoilage potential

- Initiate Alcoholic fermentation quickly and provide nutrition
- Select strains with short lag phase, minimal nutrient requirements, and moderate to fast fermentation kinetics
- Higher inoculation rates (40–60g/HL) are shown to speed fermentation and compensate for the high SO<sub>2</sub> concentrations
- Mold infections tend to lower yeast available nutrients due to microbial metabolism
- Ensure YAN's are checked, and a combination of complex nutrients and DAP are utilised to ensure healthy and complete fermentation
  - Rehydration nutrients (Fermoplus Energy Glu, Superstart)
  - Complex nutrients (Integrateur, Nutristart)
  - DAP (Thiazote, Enovit)
- **Remove wine from lees immediately after alcoholic fermentation has finished**
- **Perform tests for glucans post fermentation prior to filtration**
  - If glucans are present, beta glucan enzymes can be added to degrade rot derived glucans and decrease clogging index prior to filtration (Extralysse at 1–3g/hL, Endozym Antibotrytis or Glucapec 2–4g/hL)

## RED GRAPES

Same concepts as white winemaking with red wine specific suggestions below

- **Keep pre-fermentation stage as short as possible**
  - Cold soak will allow increased spoilage microorganism populations
  - Shorter pre-fermentation stage will limit air contact/oxygen pick up
- **Sacrificial tannin additions 200–500mg/L**
  - Tannin VR Supra or Fermotan used at the crusher or immediately after to inhibit oxidation enzymes and bind proteins derived from spoilage microorganisms
- **Extraction enzymes during early fermentation, beta-glucanase at mid fermentation**
  - Short maceration times are recommended to limit laccase and polyphenol oxidase effects
  - Laccase can oxidize anthocyanins making colour stability an issue in reds
  - Extracting as much from the skins during fermentation will increase colour intensity and stability (LafazymFruit or Endozym Pellicular)
- **Assess cap management techniques**
  - Limiting pump overs/punch downs will reduce oxygen introduction and mechanical break down of mouldy skins
- **Avoid removing lees from tank when digging out/pressing off**
  - Glucans and unwanted enzymes/proteins will settle in the lees and should not be reintroduced into the wine
- **Press while CO<sub>2</sub> is still actively being produced** CO<sub>2</sub> will limit ingress of O<sub>2</sub> into wine
  - Active yeast will scavenge any oxygen that is dissolved and limit the oxygen available for laccase spoilage
  - Fine heavy pressings with beta glucanase enzymes (Extralysse at 1–3g/hL, Endozym Antibotrytis 2–4g/h)
- **Drain to tank not barrel**
  - Drain/pump red wine to tank and allow lees to settle prior to barrel filling
  - Further racking can limit laccase activity by reducing contaminated lees
  - Test for laccase activity prior to going to barrel and treat with Tannins or Endozym Antibotrytis if laccase is present
- **Beta glucan enzyme treatment can aid in filtration/clarification**
  - (Extralysse at 1–3g/hL, Endozym Antibotrytis or Glucapec 2–4g/hL)

These are guidelines only and to be applied based on the extent of infection and condition of fruit.

All necessary viticultural prevention should be taken to prevent/minimize fungal infection.

**\*\*Trials are always recommended when assessing dosage rates and product impacts on juice and wine\*\***

**Contact your local representative for product information and availability**

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