AWRI Australian Wine Research Institute

Fact Sheet
WINEMAKING

Managing powdery mildew in the winery

What is powdery mildew?

Powdery mildew is a fungal disease that affects grapevines, caused by the fungus *Erysiphe necator* (formerly *Uncinula necator*). If not controlled, powdery mildew can cause crop losses and have negative impacts on wine quality. The presence of powdery mildew can also increase the risk of *Botrytis* infection.

What are the implications for the vineyard?

Powdery mildew is primarily managed in the vineyard through monitoring and use of preventative vineyard sprays.

Information about managing powdery mildew in the vineyard is provided in the following fact sheets:

- Powdery mildew characteristics
- Powdery mildew management
- Powdery mildew monitoring
- Powdery mildew symptoms

What are the implications for winemakers?

When processing fruit infected by powdery mildew, must aroma and chemical composition may change. Stummer (2005) and Steel et al. (2013) indicate that powdery mildew can cause:

- undesirable aromas such as mushroom, earthy, wet fur and cooked tomato characters
- undesirable textural changes including increased oiliness and viscosity

- increased phenolics and bitterness
- increased titratable acidity
- reduced spectral colour
- increased pathogenesis-related protein expression and increased hazes in white wine
- increased microbial populations on powdery mildew-affected grapes and susceptibility to secondary infection by other microbes
- increased fermentation duration.

Harvest and sorting

- Fruit can be selectively hand harvested and infected fruit avoided.
- For machine-harvested fruit, hand pickers can remove the worst-affected fruit prior to machine harvesting.

Strategies for processing white grapes

- Use a higher rate of sulfur dioxide (SO_2) at harvest (in the range of 60-100 mg/L depending on severity).
- Use shorter pressing cycles to minimise skin contact and extraction. (Whole bunch pressing of affected fruit is common in Europe).
- Keep the first 150 L per tonne separate and assess for any negative attributes. If present, either discard, or conduct fining trials (see below).
- Likewise, assess each press fraction for mouldy character to allow separation of impacted fractions.
- If mouldy characters are observed, fine with bentonite (200-300 ppm), casein, skim milk or PVPP.
- Cold settle or float to achieve lees separation. Use additional enzyme to aid settling.
- Rack and process separately the lees (higher solids) fraction.
- Avoid natural fermentations – inoculate with a pure culture at higher rates to reduce the risk of undesirable microorganisms.
- Check yeast assimilable nitrogen (YAN) levels as these can be lowered by powdery mildew infection or other microorganisms.
- Expect to use greater levels of bentonite than usual for protein stabilisation.

Strategies for processing red grapes

- Use a higher rate of sulfur dioxide (SO_2) at harvest (in the range of 60-100 mg/L depending on severity).
- Minimise the time between harvest, crushing and inoculation.
- Avoid cold soak.
- Avoid natural fermentations – inoculate with a pure culture at higher rates to reduce the risk of undesirable microorganisms.
- Check yeast assimilable nitrogen (YAN) levels as these can be lowered by powdery mildew infection or other microorganisms.
- Press early (2°Bé) to remove from skins
- Avoid post-ferment maceration and extended lees contact.
- Consider gelatine fining for wines showing excessive coarseness or lack of balance.

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Further reading

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