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## Viticulture Fact Sheet

### Key Points

- From about E-L 12 (5 fully expanded leaves), **monitor for flag shoots** and use a **hand lens** to find primary infections on the underside of leaves
- **Spray intervals can be lengthened** in very cool weeks after bud burst as shoot and fungal growth is slow
- **Keep spray intervals tight** and select effective fungicides when shoots are elongating rapidly pre-flowering (from E-L 15) and during flowering
- **Monitor** the number of unprotected leaves between sprays

## Managing powdery mildew in cool climate vineyards

Managing powdery mildew in cool climates requires a specific approach as the fungus develops in close synchrony with the rate of shoot growth. The fungus *Erysiphe necator* is the cause of this 'green' disease which preferentially infects soft green tissues.

Regardless of climate, powdery mildew can surprise growers by 'suddenly' appearing as a serious outbreak in the vineyard. It takes a careful eye and diligent monitoring to spot the first sign of disease.

Relatively low levels of powdery mildew on fruit can taint wine, with the result being dependent on the grape variety. The winemaker may reject grapes or apply a price penalty when powdery mildew is not managed to their specification.



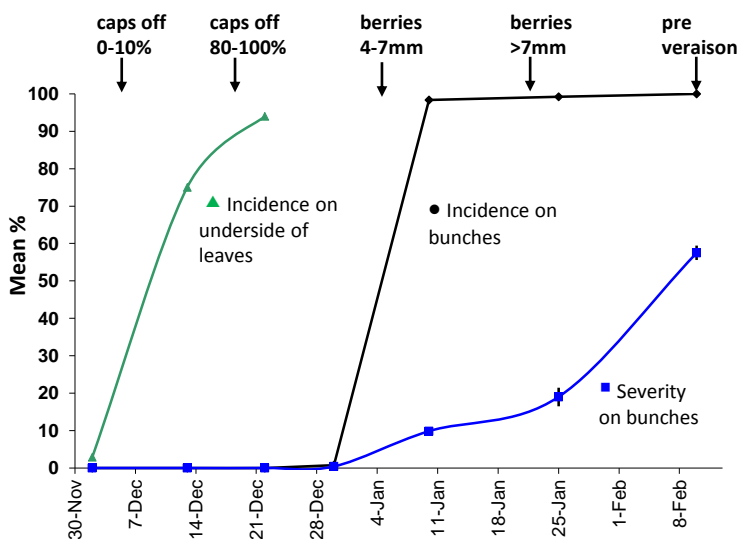
## Where does powdery mildew come from?

Powdery mildew infections develop from windborne spores. Spores come from dormant overwintering fruiting bodies lodged in bark cracks and crevices or from flag shoots that grow from buds infected in the previous season. Read more here:

<https://goo.gl/p1qCeT>

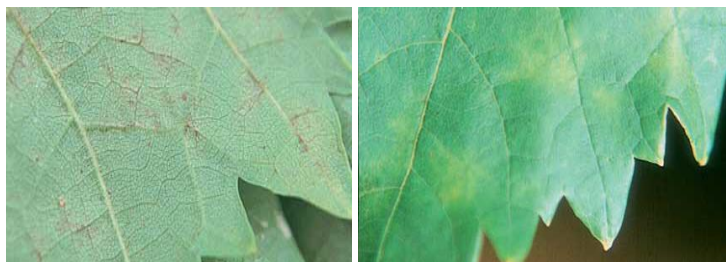
## A disease of two epidemics

Powdery mildew has two different but well connected epidemics – one on the leaves and one on the bunches. Typically the epidemic on the leaves provides the spores for infecting grape bunch tissues. In southern Tasmania it is common for the first epidemic to first occur on the **undersides of leaves** followed by the appearance of mildew on **bunches and/or the top side of the leaves**, especially near shoot tips and on laterals later in the season.



## The first signs of infection

In southern Tasmania you would expect to see primary infections from mid to late spring. These can be hard to see so grab a 10 X hand lens and start your vineyard hunt in previous disease hotspots. Look on the **undersides of the lowest leaves for browning of the smallest veins (left)**. The **tops of leaves** may show corresponding **irregular yellowish patches (right)**.



Images courtesy Peter Magarey

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## Monitoring to get it right

On spraying day (before you spray) mark the youngest expanded leaf with a piece of flagging (surveyors') tape or a plastic bread bag tag. The number of new, **unprotected leaves** can then be easily seen before your next spray, guiding your spray timing.

## Timing is everything!

Preventing powdery mildew means protecting susceptible tissues. Timing protective sprays is based on disease risk and shoot growth rate.

### • **Early season – slow it down**

Disease risk in the first 4-6 weeks after bud break is relatively low. Shoots emerge and grow slowly. Mildew development is also slow. Protection during this phase may be needed but **at a longer spray interval**.

### • **Pre-flower and flowering – speed it up**

A **critical time** is when shoot growth starts to speed up, after E-L 12 (5 fully expanded leaves). Leaves take on a lush green appearance and shoots lengthen rapidly. This is when **protection needs to be tight with a shorter interval between sprays**. Infection during the pre flowering period provides spores for infecting highly susceptible flowers and young fruit (< 4 mm diameter) to create the second epidemic. *This is the time to use your best powdery mildew fungicides*. Sulfur is a good fungicide to use as the final spray (for leaf protection) as it has good persistence.

### • **Late season**

Avoid spraying bunches with visible mildew. By the time you see mildew, most berries are probably highly resistant to new infection.

## A disease of young green tissue

The susceptibility of grapevine leaves and berries to powdery mildew changes over time. When grapevine leaves are growing rapidly they are highly susceptible to infection. The green floral parts and fruit in the early fruit set period are also highly susceptible until **all berries** reach 4-7mm diameter (pea sized).

## Powdery mildew storm

A combination of warm weather (20-30°C), high soil moisture, vigorous vines and cloudy days that reduce UV intensity can create the perfect powdery mildew storm. This is when spray intervals need to be tight.

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