



Managing powdery mildew

Other topics in this Viti-Notes series include:

- Characteristics of powdery mildew
- Monitoring for powdery mildew
- Symptoms of powdery mildew

Powdery mildew is a disease of grapevines that is most likely to occur in previously infected areas, sheltered vineyard sites, and shaded or dense parts of vine canopies. Characteristic diseased 'flag shoots' occur in spring but can be difficult to find.

There is a range of oils and sulphur products available to ameliorate the effects of powdery mildew and research is continuing into milk by-products and other 'soft' control options that are yet to be registered.

Essential components for strategic management of powdery mildew include understanding the characteristics of the organism which causes the disease, monitoring at appropriate times and applying effective cultural and chemical controls.

[Effectively timing of chemical control strategies](#)
REMEMBER CHEMICAL REGISTRATIONS VARY BETWEEN STATES SO CHECK THE PRODUCT LABEL FOR USE IN YOUR VINEYARD. GROWERS SHOULD ALSO CONSULT WITH THEIR WINERY WHICH MAY HAVE SPECIFIC REQUIREMENTS.

Good management of powdery mildew lowers disease risk in subsequent seasons.

If there is a history of powdery mildew in the vineyard, then it is important to plan an early season spray program. Preventative spray programs reduce the risk of crop loss, but increase the number of sprays applied for disease control. To prevent disease spread from infected flag shoots before spores are dispersed, apply protectant fungicides such as sulphur, Legend® (quinoxifen) or Prosper® (spiroxamine).

Cultural practices and 'soft' control options

Non-chemical practices should be always utilised to minimise conditions favourable for infection and spread of the powdery mildew organism, and to improve access to foliage and bunches for any sprays applied. These practices include:

- Ensuring certified disease-free planting material is always used
- Orientating rows in the direction of prevailing winds to encourage aeration and use of appropriate planting densities and trellises to help minimise crowded canopies
- Managing canopies to encourage air movement and the penetration of sunlight while enhancing spray penetration into the canopy
- Removing prunings and other possibly infected vine material.

The most important period for the control of powdery mildew is from just before flowering to fruit-set, depending on the region or the specific climatic conditions of the season. Disease onset can occur earlier in warmer regions or in particularly warm springs, especially when flag shoots are present. In inland areas this means powdery mildew can be a problem within the first 40 days after budburst.



Conditions at flowering may generally promote rapid disease development which can lead to a decrease of both grape yield and quality. To reduce existing infections on vine foliage and prevent disease development on inflorescences and developing berries at this time use demethylation inhibitors (DMIs) or the newer strobilurin fungicides, such as Amistar® (azoxystrobin), Cabrio® (pyraclostrobin) or Flint® (trifloxystrobin).

Spraying is generally effective if applied before the disease becomes well-established in the vineyard. Berries become resistant to further infections 3 to 5 weeks after flowering, although berry stems and bunch stalks remain susceptible to infection.

Deciding to spraying after berries are pea-sized should be based on how much powdery mildew is likely to impact on the berry stems and lead to a carry-over of the disease. If deemed necessary then consecutive sprays of a suitable registered chemical should be applied 7 to 10 days apart.

If there is an outbreak of powdery mildew late in the season, control can be very difficult, especially on large, dense canopies.

Some of the options to improve the effectiveness of any chemicals applied include:

- Utilising canopy management practices that improve spray penetration into canopies and onto bunches
- Increasing spray volumes (ensure the correct rates of chemical for the spray volume is used)
- Where appropriate, directing more spray into bunch zones.

Post-harvest sprays are usually only necessary for young, yet to bear, vines to prevent early defoliation, or in more mature vines where powdery mildew is present and there is sufficient time for further disease development before leaf fall.

Summary

In all vineyards:

- In both organic and non-organic vineyards, non-chemical practices should be used wherever practical to reduce the potential for disease development, minimise the necessity to apply chemicals, and improve the effectiveness of sprays applied.

In vineyards using chemicals or other compounds sprayed onto vines

- It is important to achieve good spray coverage with an appropriate fungicide. Incorrectly calibrated spray units and closed vine canopies reduce spray penetration and prohibit effective application of chemicals, particularly onto bunches. Effective spray application is critical for the control of powdery mildew. Refer to other Vitinotes in the Effective chemical use series.
- A preventative spray program should be implemented early in each season where there is a history of powdery mildew in a vineyard.
- Sprayed areas should be monitored to assess the efficacy of chemical application.

Checklist for chemical selection and use

- ✓ The need for chemical application determined from monitoring program.
- ✓ Decision on product use matched to life cycle stage of the organism, relevant local conditions including weather, and winery withholding periods.
- ✓ Chemical groups rotated in line with AVCARE resistance management strategies to reduce potential for build-up of disease resistance.
- ✓ Chemical labels must be read and directions for use adhered to - including rates, critical comments, mixing and application instructions, and adjuvants required.
- ✓ Chemical compatibility - have you checked product labels for incompatibility warnings before mixing?
- ✓ Water quality - water used to fill up spray tank tested for pH, water hardness and suspended solids.
- ✓ Tank mixing - adequate tank agitation during mixing/loading. Have power take-off and pump turned on when driving to the vineyard or stopping for a break.
- ✓ When applying sulphur or translaminar fungicides for control of powdery mildew, such as DMIs and strobilurins, it is important to ensure adequate water volumes are used to enable movement of the chemical into vine tissue.
- ✓ Records of pesticide applications must be maintained.

Further information

Product or service information is provided to inform the viticulture industry about available resources, and should not be interpreted as an endorsement.

- A good resource is Registered Chemicals for Viticulture (Dr Sally-Jean Bell, AWRI, 08 8303 6600 or visit www.awri.com.au)

PAM AusVit, which is a disease modelling program designed to assist in Australian vineyard management decision making through the recording, analysis and reporting of critical activities, events and conditions within the vineyard. The software assists growers and managers achieve their target levels of vineyard efficiency, yield and fruit quality, while reducing the risk of crop losses and minimising the use of chemicals. Details about PAM AusVit can be found at www.crcv.com.au/products/pamausvit/ or by phoning 1800 500 195

Chemical registrations, product recalls, and a range of other up to date information can be checked by accessing the Australian Pesticides and Veterinary Medicines Authority (previously the National Registration Authority) website at <http://www.apvma.gov.au/index.html>

AVCARE resistance management strategies can be found at www.avcare.org.au

A useful reference with illustrations of the lifecycle and symptoms is

- Diseases & Pests, editors, Nicholas, P., Magarey, P.A. and Wachtel, M., 1994, Grape Production Series 1, Hyde Park Press, Adelaide, (available Winetitles, 08 8223 4700, or www.winetitles.com.au).
- See also the glove box edition of the above, Field Guide to Diseases and Pests.

IPM Viticulture: Research to Practice¹ is a training program whose delivery can be fine-tuned to suit each region.

- Enquiries to Peter Mansfield on (08) 8222 9255 or visit www.crcv.com.au for more information.

Visit the web site at www.crcv.com.au/viticare/vitinotes/ for updates and more Vitinote titles.

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