



Symptoms of Downy Mildew

Viti-note Summary:

- Where to look
- Leaf symptoms
- Shoot symptoms
- Inflorescence and bunch symptoms
- 'Looks like' – other similar disorders



Figure 1 Obvious oil-spot and down-like symptoms on a grapevine shoot. Image courtesy of P.R. Dry.

Where to look

Look for symptoms of downy mildew after suitable warm wet nights particularly in late spring and early summer. Pay particular attention to blocks where the disease has previously been a problem and where vines may be dense, sheltered or remain wet. Monitor in a 50m radius around previously identified and tagged primary infection sites.

Leaf symptoms

Spots on leaves commonly called 'oilspots' are the characteristic leaf symptom of infection by downy mildew, and in the case of primary infection from oospores, are the main symptom seen (Figure 1).

- Yellow oilspots, initially with a chocolate-coloured edging, appear on upper leaf surfaces. The halo fades as the oilspot matures (on some varieties such as Rubired, the spot is red).
- On young leaves, oilspots can expand to around 50 mm diameter. Numerous spots can grow and merge to cover

the entire leaf.

- As oilspots age, or during hot weather conditions, the centres of the spots dry out and darken to a reddish brown colour, with only a yellow halo around the outside of the dead spot where the organism is active.
- After favourable warm humid nights, white downy growth appears on the underside of the active oilspots.
- Infection of mature leaves in late summer and autumn causes a 'mosaic-like' appearance of small angular yellow-brown spots confined by the leaf veins.
- Severe infection of the foliage causes leaves to fall, leaving the petiole attached to the stem.

Shoot symptoms

Oily brown patches spread along infected shoots, stems and tendrils. Leaves on these shoots can die and fall, and shoots may break at the point of infection.

Other topics in this Viti-Notes series include:

- Characteristics of downy mildew
- Symptoms of downy mildew
- Monitoring for downy mildew
- Management for downy mildew

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Inflorescence and bunch symptoms

Bunches are most susceptible around flowering. Berries become resistant to infection once they reach 5–6 mm (pea sized) however, they can be killed if berry or bunch stems become infected (Figure 2).

- Flowers, berries and whole bunches turn brown and have an oily appearance.
- After suitable warm humid weather, white downy growth grows on the surfaces of infected flowers, berries or stems.
- Younger berries harden and turn purplish if diseased, then brown before shrivelling and falling.
- Mature berries also shrivel and fall when berry or bunch stems are infected.

'Looks like' – other similar disorders

Spray damage, from herbicides such as paraquat, or damage from sucking insects can also produce yellow spots on leaves similar to downy mildew. However, these can be distinguished by the lack of downy growth on the underside of the spot (refer to 'Monitoring for downy mildew' for information on how to check leaves without signs of sporulation).

A white 'down' on the underside of leaves with green blister-like galls on the upper surface is caused by the feeding activities of erinose mites. On some varieties, young downy mildew oilspots are similar to young powdery mildew leaf blotches; spores of downy mildew are raised and white, while powdery mildew spores form a thin layer and are ash-grey. Also, downy mildew sporulation is almost always confined to the lower surface of the leaf. Sporulation of fungi such as *Aspergillus*, *Rhizopus* and *Penicillium* is initially white, but later changes to green, blue, brown or black.

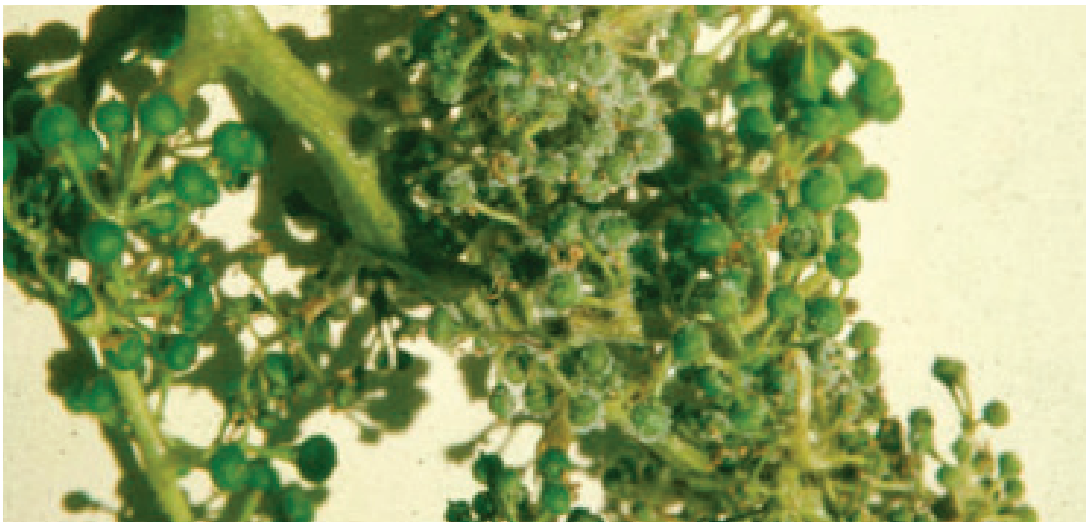


Figure 2 Early bunch symptoms of Downy Mildew infection. Image courtesy of P.R. Dry.

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Further information

Innovator network factsheets

Managing Downy Mildew

<http://www.gwrdc.com.au/webdata/resources/files/DownyMildewFactShee.pdf>

Training

For regional specific training in pest and disease control, the AWRI is running *Research to Practice: Integrated Pest Management for changing viticultural environments*. Contact Marcel Essling: rtp@awri.com.au for more information.

Agrochemical information

Agrochemicals registered for use in Australian Viticulture - updated annually. Visit www.awri.com.au for the latest version.

Useful references

Nicholas, P., Magarey, P.A. and Wachtel, M. (Eds.) 1994 Diseases and pests, Grape Production Series 1, Hyde Park Press, Adelaide (a glove box edition of this book is also available).

For images of grapevine symptoms visit www.winetitles.com/diagnosis/index.asp

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



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