viti-notes

[pests and diseases]

Research to Practice

Botrytis

Viti-note Summary:

- Economic impacts
- Factors influencing grapevine susceptibility
  - Weather
  - Site
  - Micro-climate/ Canopy architecture
  - Grapevine growth stage
  - Tissue Damage
  - Varietal susceptibility
- Life cycle of Botrytis
- Overwintering
- Infection
- Spread

Other topics in this Viti-Notes series include:

- *Botrytis*
- Symptoms of Botrytis infection
- Botrytis monitoring
- Managing Botrytis

Botrytis cinerea is the fungus which causes the grapevine diseases botrytis bunch rot and grey mould. In years conducive to disease development, substantial economic loss can occur from a reduction in yield and a downgrade in fruit quality. Managing botrytis can be a challenge because many factors contribute to infection and disease development. An awareness of these factors and methods to mitigate the impact is required.

Economic impacts

Botrytis causes direct crop loss when fruit is affected to such an extent that it is unsuitable for wine production. A laccase enzyme produced by the fungus reduces flavour, colour and storage stability of wine. Botrytis infection can open the way for increased susceptibility to other organisms. These secondary infections can induce wine taints. The threat of botrytis may also dictate that grapes are harvested before they have reached the parameters required for a particular end use. Economic costs can also result from the need for sorting and disposal of damaged bunches.

Factors influencing grapevine susceptibility

A range of natural and management factors impact on a vines susceptibility to infection by botrytis.

- **Weather:** *Botrytis cinerea* is a weather driven pathogen. High humidity or prolonged rain in conjunction with cool or mild temperatures resulting in persistent moisture on berry surfaces promotes infection and disease development. The worst case seasonal scenario is a wet spring followed by rain before harvest.
- **Site:** Previously infected sites and sheltered vineyard areas such as hollows are at greatest risk of developing the disease.
- **Micro-climate/Canopy architecture:** Vines that have dense, closed canopies retain moisture and provide conditions that suit botrytis for longer. Closed vine canopies also reduce spray penetration and prohibit effective application of chemicals.
- **Grapevine growth stage:** Grapevine flowers, immediately after capfall, and berries post veraison are particularly susceptible to botrytis infection. However, green, hard berries can be infected too. At flowering, a wound is created where the cap has abscised, creating a point of entry for the fungus. After veraison, berries begin to swell and soften while sugar levels rise and acids decrease. Sugar leakage through the berry skin can stimulate the growth of *B. cinerea* on the berry surface and any fungus inside the berry following an earlier infection may be stimulated to grow as sugar levels rise.
- **Tissue Damage:** Botrytis relies on damaged tissue to begin an infection. Any wounded green tissue is susceptible. Common causes include machine operations, vineyard practices such as wire lifting, berry splitting after the first autumn rain, feeding by birds or insects and hail or frost. Injured tissue is most susceptible in wet weather when spores landing on damaged tissue experience conditions suitable for germination and infection.
- **Varietal susceptibility:** vines that produce thin-skinned, tightly packed bunches are prone to splitting and retain moisture, providing conditions that suit botrytis. Varieties most at risk include: Chardonnay, Chenin Blanc, Grenache, Muller Thurgau, Pinot Gris, Pinot Noir, Riesling, Sauvignon Blanc, Semillon, Traminer, and Sultana. No varieties are immune to botrytis.

Life cycle of Botrytis

An understanding of the pathogen life cycle in a grapevine helps identify when preventative action will provide the most cost-effective level of control.

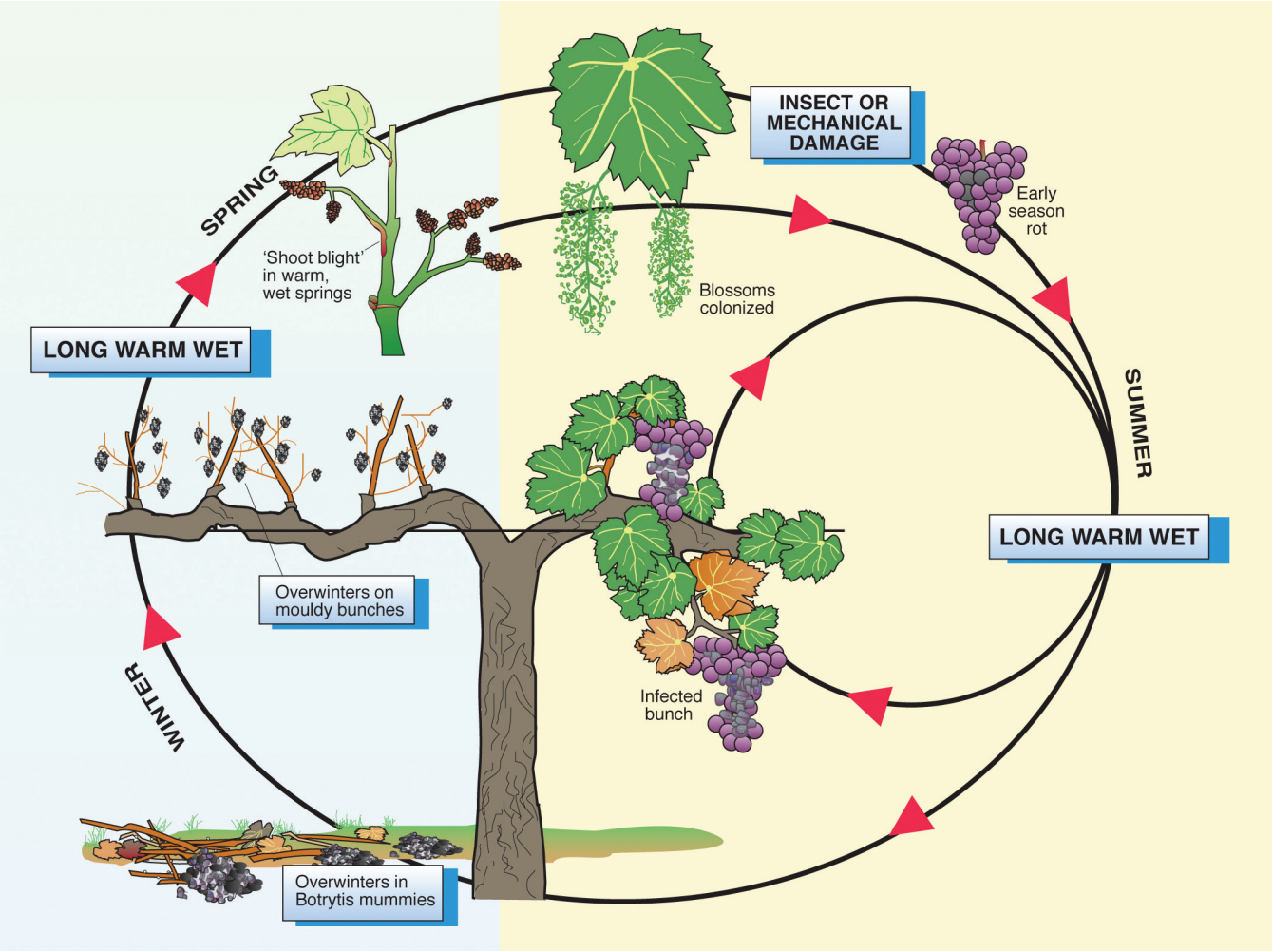

Figure 1. Life cycle of Botrytis
(Diagram courtesy of Nicholas, Magarey and Wachel, 1994, Grape Production Series Number 1: Diseases and Pests, Winetitles)

Overwintering

Botrytis cinerea survives over winter in two distinct forms. Strands of the living fungus known as mycelia can survive in cane tissue. Alternatively, resilient resting structures (3-6 mm in length, hard and black) known as sclerotia can survive attached to the vine or on decaying matter in ground litter. The fungus may also be harboured by other vegetation in and around the vineyard.

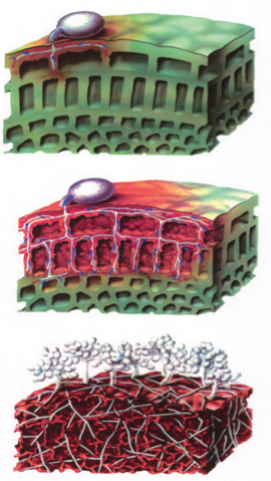

Figure 2. The Botrytis spore germinates and grows, destroying vine cells before producing more spores.

Infection

In wet or humid conditions, spores are produced by both forms of the fungus. These can be spread by wind or water splash and germinate on damaged green tissue. Flowers are a natural source of damaged tissue. A common site for infection occurs where the flower cap has detached leaving a wound.

Spread

Infection of green berries might not be visible until berries soften and wet weather provides conditions conducive to disease development. Infection can spread to adjoining berries or new infections begin from air-borne spores landing on susceptible tissue. The delayed development of symptoms after an initial infection early in the season is known as a latent infection. Even when berries are infected, rot might not occur if environmental conditions do not favour the development of the disease.

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Further information

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 <http://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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