Seasonal factors affecting *Botrytis* risk

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Development of a severe late-season *Botrytis* epidemic occurs when substantial rainfall occurs during the last two to three weeks of ripening. If there is no wet weather, it will be a *Botrytis*-free vintage. The potential for late-season *Botrytis* damage is established early in the season, via both the senescent tissue and the latent infection pathways. The more often wet and rainy weather occurs between flowering and veraison, the greater the *Botrytis* activity.

Risk factors that increase early-season *Botrytis* risk, between flowering and veraison, include:

» severe *Botrytis* in previous season, allowing abundant carry-over of *Botrytis cinerea* in vineyard debris

» wet weather events that allow *B. cinerea* to colonise senescing flower parts and to establish latent infections

» high leaf canopy density that prolongs wetness, allowing more fungal growth and higher rates of latent infection.

Risk factors that increase late-season *Botrytis* risk, between veraison and harvest, include:

» any factor that delays maturity, e.g. high crop load, a cool season, high soil fertility or excessive irrigation

» wet weather during the two to three weeks before harvest.

What can be done to reduce *Botrytis* risk?

Several vineyard management actions can decrease early-season *Botrytis* risk. These include:

» **fungicide applications between flowering and veraison**. The effectiveness of a fungicide application depends on the choice of product and its timing. Fungicide applied just before bunch closure is particularly effective because it can reach colonised flower parts within the bunch and protect the innermost berries from infection. Some fungicides used for control of other grape diseases have very low activity against *Botrytis*.

» **applications of biological control products**. Biological controls are more variable in their effectiveness than fungicides and cannot be used simply as substitutes for fungicide applications. They need to be used within an integrated strategy that includes other approaches, including vine canopy management and bunch trash removal.

» **vine leaf canopy management**. Open vine canopies have much lower risk of *Botrytis*. Actions that reduce leaf density and vine vigour, including winter pruning, leaf plucking, vine trimming, soil fertility management and irrigation management, can all decrease *Botrytis* risk. However, canopy management to reduce *Botrytis* risk must be harmonised with the canopy management that is required to achieve optimum fruit quality.

» **bunch trash removal**. The disturbance from mechanical leaf plucking and vine trimming machines, as well as the air stream from an airblast sprayer that is not spraying, will reduce the amount of trash lodged within bunches and reduce *Botrytis* risk.

» **late-season**. there are fewer actions that can be taken to decrease *Botrytis* risk.

Those that are available include:

» vine leaf canopy management (as for the early season)

» removal of infected bunches to reduce rot levels in the crop and to reduce the risk of re-infection

» harvesting earlier at lower sugar content to minimise crop loss when *Botrytis* is increasing rapidly

» application of benign control products, e.g. biological controls or calcium sprays.

Some late-season disease control options may have little or no demonstrable efficacy in reducing *Botrytis*.

Botrytis risk factors that promote *Botrytis* bunch rot

Pathogen factors

» High incidence of berries with latent infection.

» *Botrytis* visible on any tissues in the grape bunch before veraison.

Crop factors

» Thin-skinned varieties.

» Compact, tight bunches.

» Dense canopy with restricted air movement in the fruiting zone.

» Excessive soil moisture, pools of water.

» Berry splits.

» Berries pushed of the rachis and leaking juice.

» Damage from light brown apple moth, powdery mildew or other causes.

Weather factors

» Rainfall, fog, mist or dew that leads to long periods of fruit surface moisture (including intermittent rain).

» Rapid infection when temperatures are 18 °C to 21 °C (day or night) and surface moisture is present.

» Calm, cloudy days with high humidity.