What can you tell me about controlling Botrytis bunch rot without the use of fungicides?

THE BOTRYTIS FUNGUS mainly attacks dead, injured (e.g. light brown apple moth damage) or senescing tissues such as wilting flower parts and ripening fruit. Infection and development are optimal in warm (15-25°C) and humid conditions. Young fruit can become infected via attached flower parts, with the infections remaining latent (dormant) until the berries start to ripen, leading to bunch rot. The establishment of just a few early infections leads to significant spread as the berries ripen. Therefore, practices that can reduce the incidence of susceptible tissue or injuries and that alter the canopy microclimate can be very effective at controlling Botrytis bunch rot.

Canopy management

Opening up the canopy to produce well-exposed bunches can be achieved directly by various canopy management procedures; or indirectly by control of shoot vigour. This will increase aeration and reduce the time that berries are wet thereby reducing risk of splitting and making the microclimate less favorable for infection. If fungicides are applied before fruitset, this will permit better penetration and coverage of bunches. Canopy management practices include training systems, shoot thinning, shoot trimming and leaf and lateral removal in the bunchzone. Extensive research in many countries has conclusively demonstrated that training systems such as Scott Henry, Smart Dyson, Geneva Double Curtain or Lyre have much reduced incidence of bunch rot than non-positioned canopies or VSP. Reduction of shoot vigour can be achieved by deficit irrigation, 'grassing down' or crop loading followed by bunch thinning at veraison.

Bunch thinning improves aeration

Also, early bunch thinning to reduce the incidence of 'bunch-on-bunch' contact can significantly improve bunch aeration and reduce the possibility of inter-bunch fungal spread. Keep in mind that well-exposed bunches are susceptible to sunburn in warm to hot and sunny climates. Furthermore, extensive research has shown that excessive exposure can also have detrimental effects on wine quality in such situations.

Bunch architecture plays a major role in determining bunch rot incidence. The looser the bunch, the greater the airflow and the lower the risk of berry to berry spread of the fungus. Research has shown that, with the same incidence of latent infection or veraison infection, loose bunches have less bunch rot than compact bunches. How to make bunches looser? For some winegrape varieties, there is significant variability among clones for bunch looseness. For example, the Mariafeld clone of Pinot Noir has looser bunches than many other clones and as a result has been found to have less rot. Retaining more nodes at pruning so as to increase shoot and bunch number per vine can be effective. These bunches should set fewer berries per bunch to compensate for the increased bunch number. Furthermore, the increased crop load will compete with shoot growth and thus potentially reduce shoot vigour. If the resulting bunch number is excessive for the planned end use, bunch thinning can be done prior to veraison in order to adjust yield to the desired level. This should be done as late as possible so as to maximise competition with shoot growth.

Reducing fruit set

An alternative approach to loosen bunches is to deliberately reduce fruit set by removal of the eight or so basal leaves on fruiting shoots at the beginning of flowering (E-L 19). This can be done either manually or mechanically. This practice has been successful in experiments with several winegrape varieties including Semilllon, Trebbiano, Graciano and Sangiovese. Not only has bunch compactness been decreased (mainly as a result of fewer berries per bunch) but also less bunch rot has been observed. This technique works because the basal leaves, prior to flowering, are the most important source of resources for the developing inflorescence. The increased bunch exposure that will result might need to be compensated for by the manipulation of shoots to provide protection of bunches, particularly on the west side of north-south rows. If vines are sufficiently vigorous, growth of lateral shoots in the bunchzone might provide adequate protection of bunches later in the season (the lateral shoots should not be removed at the time of defoliation). An alternative to leaf removal is the application of an anti-transpirant spray to the whole canopy from the start of flowering. This temporarily reduces photosynthesis in those leaves and thus greatly decreases the supply of photosynthate to the developing inflorescences. The anti-transpirant used in most research has been Vapor Gard[1] (a water emulsifiable concentrate of terpenic polymer known as pinolene) and this is available in Australia.

Varietal tolerance

Some varieties are more tolerant of bunch rot infection than others due to either loose bunches or thick skinned berries that are less prone to splitting, or a combination of both. For example, emerging varieties Fiano, Gruner Veltliner, Montepulciano, Petit Manseng, Saperavi and Tannat are said to have such characteristics. Deficit irrigation strategies can result in looser bunches mainly due to a reduction in berry size. Spray application of gibberellic acid (as GA3) at early flowering can be used to lengthen the bunch framework, reduce berry number per bunch and increase berry size of seedless tablegrapes such as Sultana (syn. Thompson Seedless). However, this practice is not recommended for seeded grape varieties (wine, table or drying) because it has been found to reduce bud fruitfulness and increase the incidence of primary bud necrosis (PBN), collectively resulting in reduced bunch number in the following season.

Nitrogen a factor in Botrytis

Plant tissues high in nitrogen are most susceptible to infection by Botrytis. Furthermore, excessive nitrogen supply will result in increased shoot vigour and dense canopy. Therefore, carefully monitor vine nitrogen status by tissue analysis and avoid over-fertilisation. Reduce berry damage by controlling light brown apple moth and other pests. Consider alternatives to cover crops that might host the fungus and/or harbour light brown apple moth.

[1]Vapor Gard is a registered trademark.

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