MAGAREY PLANT PATHOLOGY

GrowCare Clare

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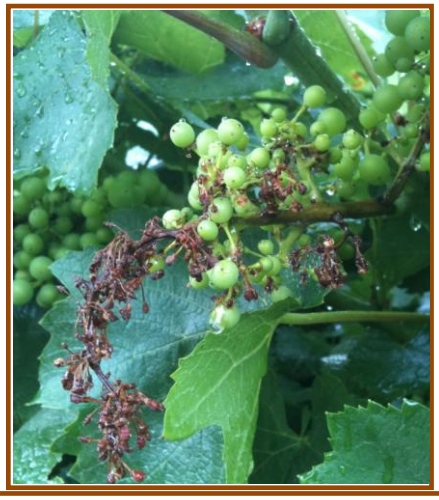
Season 2010/11

- **In Clare, this season** was one of the wettest since 1973/74 and 1974/75, surpassing the difficult seasons of 1992/93 and 1983/84.
- **The wet conditions** brought three waves of assault on vineyards by diseases: first downy mildew, then powdery and finally, the bunch rots. What, if anything, can be done about them now in readiness for 2011/12?

Downy Mildew

- **This year,** the regular succession of rain events suitable for primary and secondary infection led to a severe test of control practices in the vineyard.



Downy mildew bunch infection sometimes occurred despite spraying. Spray timing was critical to achieving effective control of weather-driven diseases but careful monitoring of weather data helped achieve this in the very wet conditions of 2010/11.

Where to from here? – Downy Mildew

- **Post-harvest**, little can be done for downy. The high number of oilspots in many vineyards means that many oospores, the overwintering form of downy, will have already formed. These will fall with the leaves and survive in the soil for many years. No treatment of the vine or the soil is effective against oospores.
- **Early next season**, the renewed levels of downy inoculum (the oospores) will increase infection potential significantly. Like bunch rots, the level of disease will depend on the prevailing weather.
- **For good control**, careful assessment of vineyard conditions will be required. Accurate timing of sprays will be critical to success in wet conditions.
- **For this to occur,** synchronise spray timing with infection periods. This will require accurate processing and interpretation of weather data from stations within vineyards.

Powdery Mildew

- **Powdery mildew develops mostly** from buds infected in the previous season. These produce flagshoots that spread disease when spores develop on the infected parts of those shoots. These spores develop in dry weather over a range of temperatures but they develop 2–3 times more in number when the relative humidity is high (RH >40%).
- **As a result,** the amount of powdery mildew that carries over winter has a large influence on the initial levels of disease next season. The more infected buds, the more the disease spreads in early season. This determines the ease/difficulty in controlling disease that season.

Powdery mildew produces ash-grey to white fungal growth over both surfaces of leaves (left & lower right). Fungicide sprays provided excellent control of powdery mildew if applied with effective coverage **(top right).**

Where to from here? – Powdery Mildew

- **Post-harvest**, after a season with high levels of powdery, is too late to control the disease. Buds for next season were infected early in 2010/11. A second form of the fungus, the cleistothecia, has already formed also. Once formed, there is no fungicide control for these resistant structures either in the foliage or on the vine cordons and trunk where they survive the winter.
- **If powdery levels were low** until harvest, few if any cleistothecia will have developed to date. If so, a post-harvest fungicide to keep disease levels low is worth considering especially in early varieties with a long post-harvest period before leaf fall. To be effective, apply this spray before the disease reaches high severity i.e. before the disease covers leaf surfaces.
- **Early next season**, maintain a high level of vigilance to ensure that early-season sprays are well-timed and applied with thorough coverage. If so, good control of powdery mildew from infected buds (flagshoots) and ascospores (from cleistothecia) can be expected.

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The Bunch Rotting Agents

A range of organisms cause bunch rots. The most well known is the widespread fungus *Botrytis cinerea*. Other agents include the fungi *Aspergillus, Alternaria, Cladosporium, Penicillium* and *Rhizopus spp*. while various yeasts and bacteria ferment berries and cause the sour rots. In combination, the lesser-known rots are often more damaging than Botrytis bunch rot alone.

These agents activate in warm humid conditions. They survive in plant residues of all kinds and in the soil, in so many different places that they cannot be eradicated. Wind, rain and insects spread spores from the bunch rots.

Where to from here? – Bunch Rots

- **Post-harvest**, little can be done for the bunch rots. However, because inoculum on the vineyard floor offers lesser infection potential for next season's young canopy than does inoculum that over-winters on the vine, consider removing unpicked fruit.
- **Note:** The cost of this operation means that, if done at all, it is probably best achieved during pruning but your particular vineyard circumstance will vary the decision for different patches.
- **There is small gain** in cultivating-in the bunches once they are on the soil surface. The expense would offer questionable advantage in reducing inoculum loads in the vineyard. The main factor influencing early-season bunch rot is the occurrence of favourable conditions at flowering.
- **Early next season**, assess the prevailing weather (especially rainfall) to determine the risk of bunch infection by Botrytis in particular. Sprays during flowering may be warranted but because the bunch rot organisms need warmth and moisture for infection, they will **not** be a major problem next season **if** the weather stays dry.

Summary

In vineyards of the Clare Region, controlling the three main diseases in 2010/11 was extremely difficult, due in part to:

- **The need to target** different types of diseases at different times during the season. For example, because downy mildew and botrytis are weather-driven diseases, the timing of their controls was dependent on synchronising sprays with weather events. Given the number of times extended periods of leaf and bunch wetness occurred, this was effectively impossible for the bunch rots.
- **In contrast, powdery mildew**, which grows throughout the season, required more or less constant control from just after budburst.
- **Effective control** requires good spray coverage and the wet and occasionally windy conditions made it hard and, at times, impossible to keep effective coverage on rapidly developing shoot growth.
- **Diseases affect different parts** of the vine. Control of bunch rot requires sprays primarily to the bunches, whereas control of the mildews on bunches requires minimising inoculum on the foliage. This needs good spray application over the entire canopy.
- **A lack of supply** of Ridomil® at times compromised the control of downy mildew while a better understanding of the disease life cycle and/or more precise information delivered to users might have given a better result.

Botrytis bunch rot on Ruby Cab. (left) and with other rots, including sour rot, on Riesling (right). Extended leafwetness in warm, humid conditions during 2010/11 triggered growth of the buff-coloured fungal spores that spread bunch rot and favoured other bunch rotting organisms.

Seasonal Weather Outlooks

- **The weather events in 2010/11** were strongly influenced by what is called the *La Niña* effect. This is a meteorological event that is controlled by the temperature on either side of the Pacific Ocean. These fluctuate like an overgrown seesaw. When the sea temperature is up on the western Pacific (near Australia), we get wet seasons, like 2010/11. When the temperatures are down, we tend to have drier summers.
- **At present, the *La Nina*** effect is neutralising, meaning we are likely to have 'more-like average' rainfall over winter.
- **For a good description on these**, and similar systems in the Indian Ocean that influence our weather patterns, and for useful information on seasonal outlooks for temperature and rainfall, visit the Bureau of Meteorology web-site at:
  http://www.bom.gov.au/climate

Where to from here? - Conclusion

Next season pay careful attention to early-season weather events. If necessary, check the Bureau of Meteorology web-site (as above). Take care to ensure that vineyard sprays are applied with good coverage and are timed in close alignment with:

- the timing of budburst, for powdery;
- the timing of infection events, especially from early-season, for downy mildew; and
- the timing of flowering, if needed in wet conditions, for bunch rots.

This message was prepared for
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