

Controlling Powdery Mildew - What to spray and When?

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Powdery mildew is the main fungal disease that grape growers throughout Australia confront most seasons. Although the problem was not as widespread as last season, many growers struggled to keep the problem under control in the 2002/03 season.

In recent years a number of new fungicides have come onto the market that provide good control of powdery mildew. These and other fungicides currently registered for use on grapes are shown in Table 1. They can be divided into 5 groups or classes according to the mode of activity on the fungus.

The newest group of fungicides are the strobilurins Amistar and Flint, and soon to be released Cabrio, which belong to group K. Group E is represented by Prosper and group M by Legend. Another large group, classified as group C materials and also known as DMI's, consist of the fungicides Bayfidan, Mycloss, Rubigan, Topas and others. Most of these have been used on grapes for many years. The final group Y consist of the many forms of sulphur such as wettable sulphur or dusting sulphur. The last two groups, the DMI's and the sulphur fungicides have been the mainstay of powdery mildew control in most grape growing areas of Australia.

With the wide range of fungicides now registered for use on vines, the question arises as to which is best and when is the most appropriate time to apply any group. There are no simple answers to these questions, and the decision should not be based on cost alone, as the cheapest may not be the most cost effective material in the long term. Some fungicides are more effective than others when evaluated in trials but they all control powdery mildew when correctly applied and used in commercial situations. Where powdery mildew control is poor this is usually due to inadequate spray coverage or the interval between sprays being too long rather than reduced fungicide efficacy.

The one exception is where a DMI fungicide has been over used and populations of the powdery mildew fungus have become less sensitive to the fungicide. To reduce the likelihood of such resistance occurring, most manufacturers recommend that fungicides be used no more than 3 times in a season and in many cases on no more than 2 consecutive applications.

Grape berries are most susceptible to powdery mildew during the period from flowering to 4 to 5 weeks after fruit set, and failure to control the disease during this period can result in serious crop loss. Recent research suggests that the best control is achieved by applying the strobilurin or DMI fungicides during this period. We have shown that 2 or 3 applications of a strobilurin fungicide around flowering combined with other fungicides before and after set in a 5 or 6 spray program provides excellent control of powdery mildew. The advantage of applying the strobilurins Amistar or Cabrio during this period is that both these materials also control downy mildew, whereas the DMI's have no activity on this disease. The results of some of these trials

have been published in the the Australian & New Zealand Grapegrower and Winemaker (Vol 59, Sept 2002) and the Australian Journal of Grape and Wine Research (2002) 8:132-139.

Suggested spray periods with different products are shown in Figure 1, however the efficacy of many of the spray programs has not been tested. Further trials need to be carried out to determine which of these combinations is the most effective, and the most appropriate spray frequency to use in the different programs.

How fungicide use is managed is an important issue in the industry. Not only to minimise pesticide use and eliminate residue without compromising control, but also to reduce the risk of fungi developing resistance to fungicides. With 5 different classes of fungicides now available, the number of applications of any one particular group in a season can be reduced by using them in rotation with fungicides from one or more of the other groups.

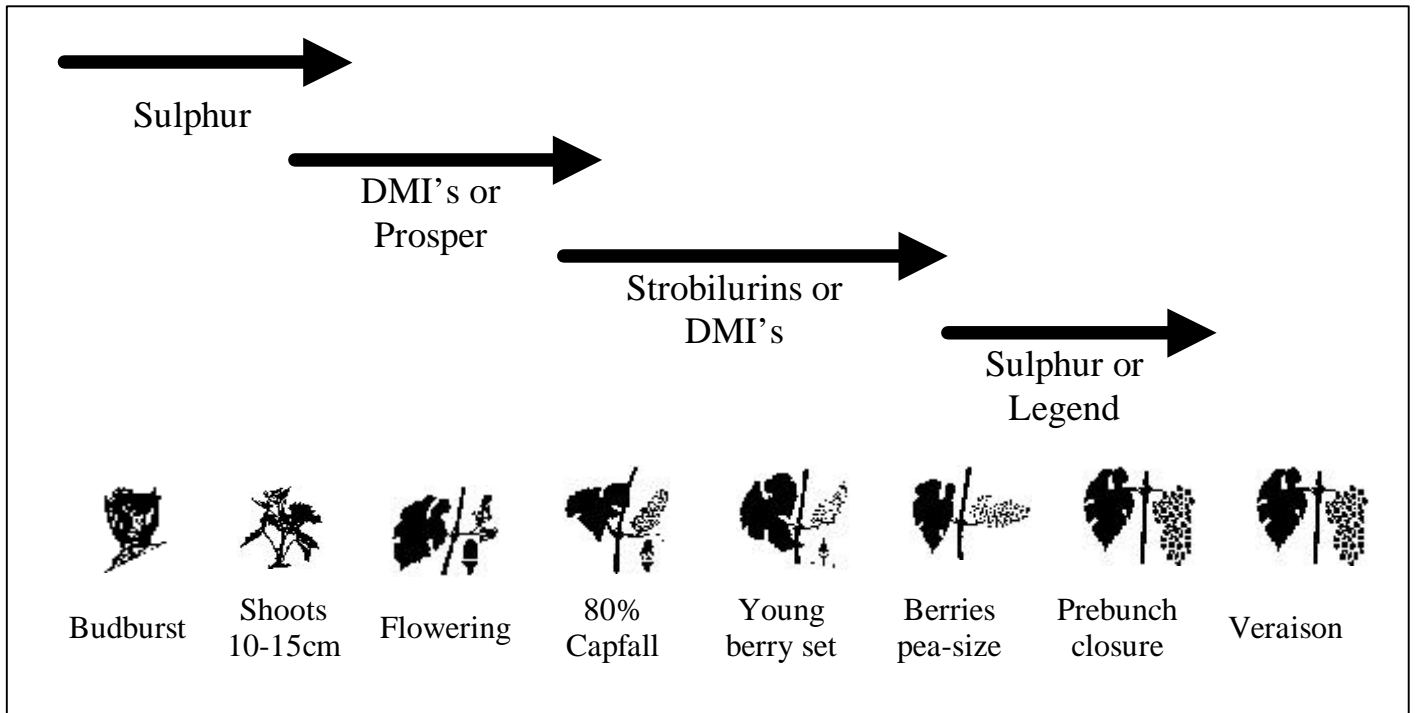
Research into fungicide use and spray timing needs further funding. Despite the recent work on powdery mildew resistance genes and genetically modified plants, fungicides will remain the main means of controlling powdery mildew for the present generation of grape growers. The use of alternative spray programs with different chemical groups will provide good control of powdery mildew and ensure that no chemical is over used and that all will remain effective for many years.

Table 1. Powdery mildew fungicides registered for use on grape vines

Product	Active Ingredient	Activity Group
Amistar	azoxystrobin	K
Cabrio*	pyraclostrobin	K
Flint	trifloxystrobin	K
Anvil	hexaconazole	C
Bayfidan	triadimenol	C
Mycloss	myclobutanil	C
Nustar	flusilazole	C
Rubigan	fenarimol	C
Topas	penconazole	C
Prosper	spiroxamine	E
Legend	quinoxifen	M
Sulphur(s)	sulphur	Y

* Registration pending at time of publication

Figure 1. Some suggested spray periods* for fungicides used to control powdery mildew.



* One or more sprays to be applied in each period