USING BIOPEST® IN GRAPES FOR CONTROL OF POWDERY MILDEW, SCALE AND MEALYBUGS

Key Points

- BIOPEST® is an effective disease and pest control option in grapes.
- IPM friendly and organically certified.
- No potential for resistance development.
- Registered for applications up until bunch closure (E-L stage 31).

Controlling powdery mildew, mealybugs and scale is a serious problem for many grape growers, but with BIOPEST® they now have the option of using one product to control all.

- Mealybug and scale are becoming difficult to control in a number of areas, a situation exacerbated by the limited number of products available for control.
- BIOPEST® has been successfully used by growers over a number of years to control powdery mildew in the Yarra Valley, Riverland and Western Australia (See Chart 1).
- BIOPEST® has recently been evaluated successfully for control of mealybug in the Sunraysia and SW of WA.
- BIOPEST® is currently undergoing evaluation in full organic vineyards and as a control option for newly emerging scale problems.

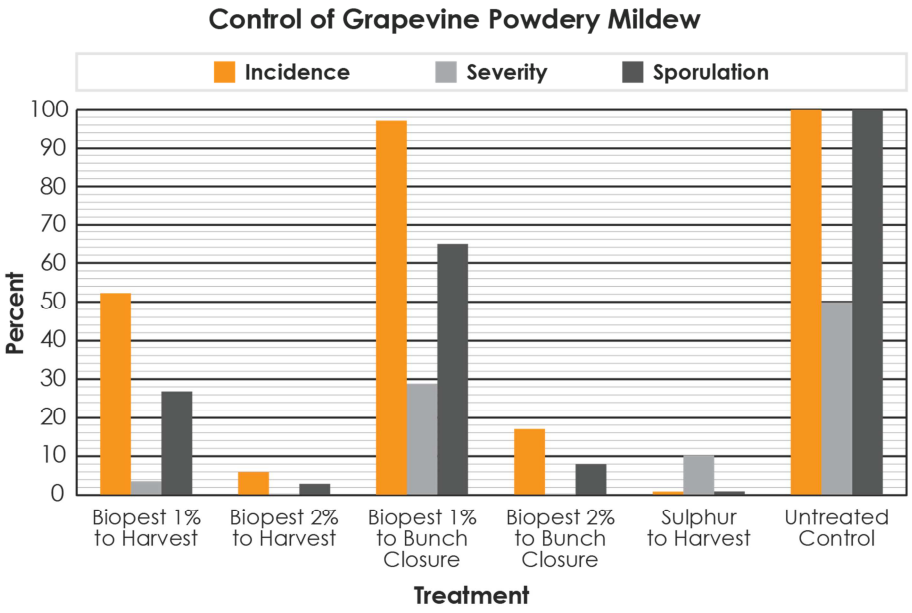

Chart 1: Scores for % incidence, severity and sporulation of grapevine powdery mildew (Erysiphe necator) on leaves following treatment of cv Ruby Cabernet with various fungicides including BIOPEST®, Loxton North, South Australia, January 2011. *Source: Margarey & Hayes – Loxton 2011*

Product overview

SACOA's BIOPEST® is a highly refined iso-paraffinic oil with biorational pesticidal properties, which make it different to other products which use synthetic chemistry.

BIOPEST® v. Synthetic chemistry

- BIOPEST® acts on pests primarily by smothering and drowning, however newer research indicates that BIOPEST® can reduce the output of volatile compounds from plants making them less attractive for feeding.
- Sucking pests are generally less mobile than beneficials and are therefore more susceptible.
- Synthetic chemistry generally disrupts insect nervous systems once ingested through sap feeding or absorbtion through the exoskeleton - most are required to translocate through the plant or coat the insect.
- Due to the physical mode of action of BIOPEST®, there is no potential for resistance development.

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An IPM friendly, organic solution

BIOPEST® is also an effective stand-alone fungicide across a range of crops (i.e. powdery mildew in grapes) making it an organically certified alternative to sulphur.

BIOPEST® is similar to sulphur in that it is a protectant fungicide, but has the advantage of working effectively in cool weather, controls vine scale and mealybug and does not have the unpleasant odour of sulphur.

It's a great product for growers looking to implement IPM programs as it is very soft on predatory insects. With this in mind, SACOA recently obtained certification with the Biological Farmers Association for the use of BIOPEST® in organic viticulture.

BIOPEST® Control of Mealybugs in Grapes

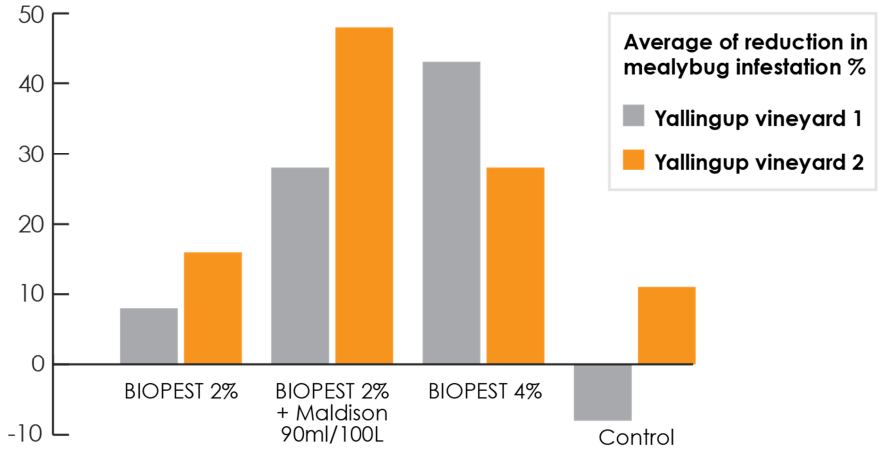

Chart 2: Using BIOPEST® as a trunk drench for post-harvest mealybug control in grapes.
Source: AHA Viticulture – SW WA April 2014

Using BIOPEST®

BIOPEST® is registered for use up to E-L stage 31 (berries are pea size, formerly referred to as bunch closure), however trial work conducted with the Australian Wine Research Institute showed there were no significant impacts on winemaking or the sensory characteristics of resultant wine when BIOPEST® was used at twice the recommended rate up to one day before harvest.

BIOPEST® is not subject to resistance so there is no need to limit product applications as with some other chemical groups.

The importance of correct application

BIOPEST® is not a magic bullet and will only control diseases and pests when used correctly, particularly targeting the right pest stage. As BIOPEST® is a protective product, thorough application is essential and higher water rates will definitely assist with achieving good coverage. Spray intervals will also need to be tightened if disease pressure is high.

Caution is also needed when alternating between BIOPEST® and sulphur sprays with an interval of three weeks between applications preferred. With no obvious symptoms the crop will continue to grow but will have a reduced yield of up to 40%.

Key points for using BIOPEST® in grapes

- To prevent damage to foliage allow at least 3 weeks between sulphur applications. BIOPEST® alone will provide control of powdery mildew in place of sulphur.
- To avoid adverse effects on fruit size in table grapes, do not apply in mixtures with or within 3 weeks of a growth regulator like Dormex®.
- To avoid potential for fruit marking in table grapes, apply from early bud burst up to 15mm diameter fruit in quick drying conditions.

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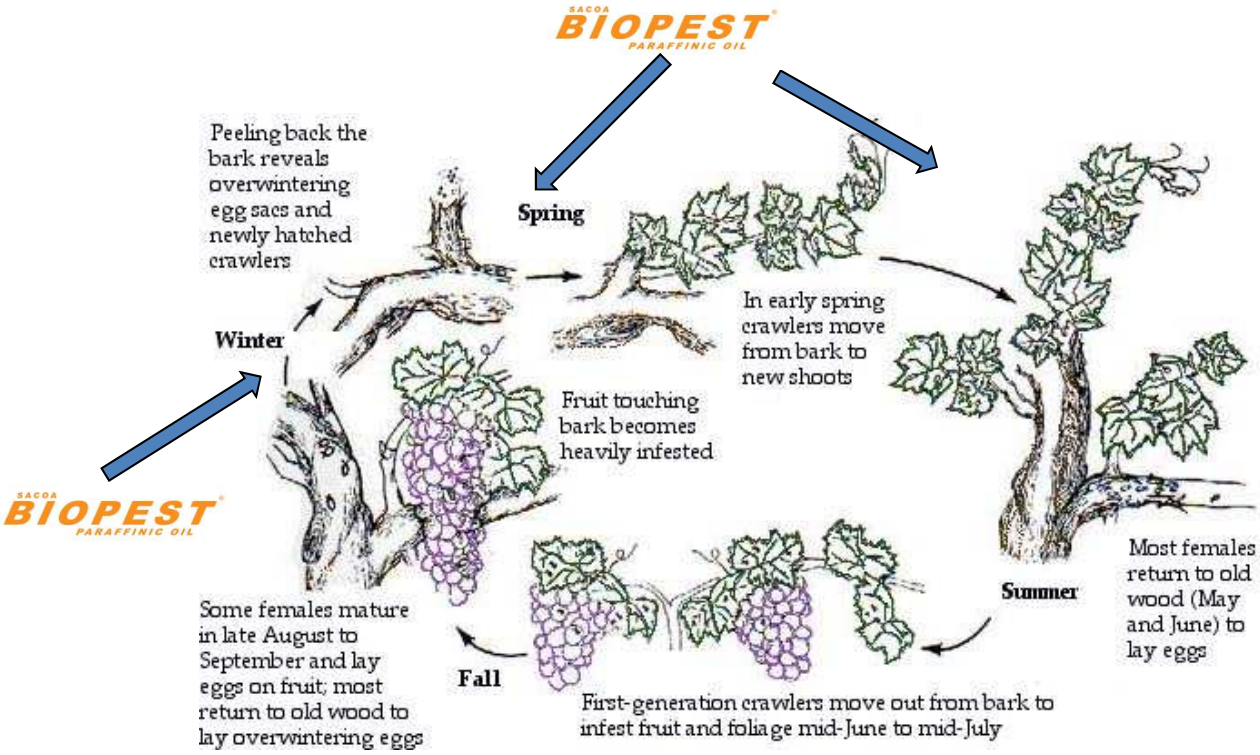

Figure 1: The mealybug lifecycle where SACOA recommends applying BIOPEST® in winter and spring.
Source: UC DAVIS

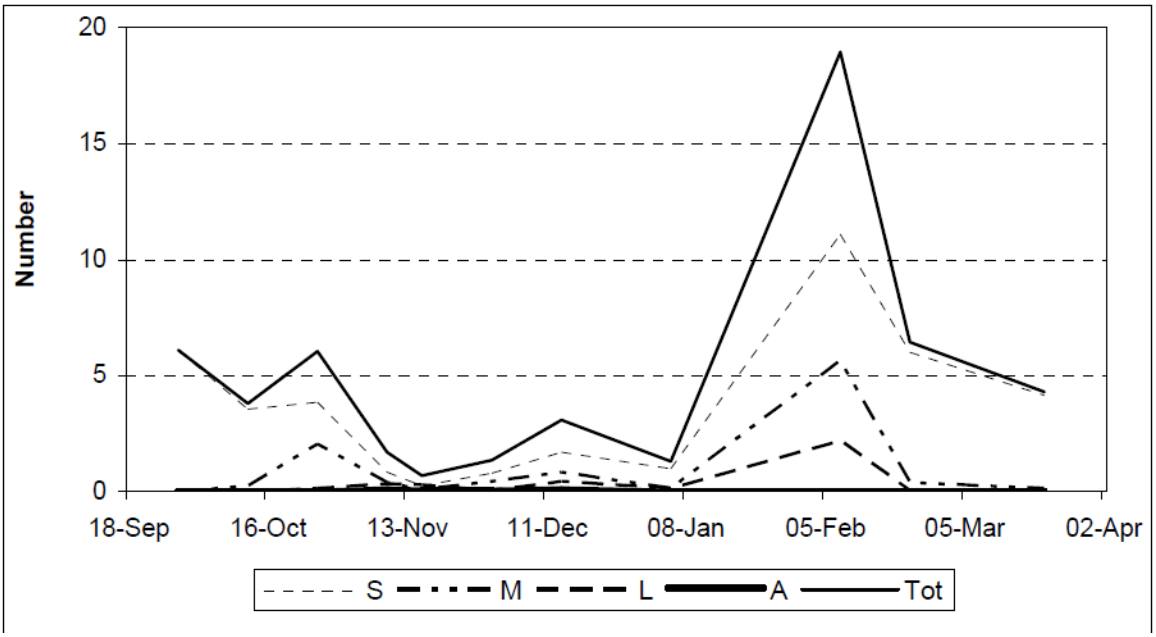

Fig. 2. The number of longtailed mealybugs per leaf and the proportion of leaves infested expressed as a percentage of all stages of mealybugs in untreated plots in a vineyard where an insecticide trial was conducted, Northcliffe, WA 2004/05. Sizes of mealybug were classified as small (S), medium (M), large (L) or adult (A) depending on body length
Source: S. Learmonth – GWRDC RT04/06-02

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Key points for using BIOPEST® to control mealybug and scale in grapes

- As with many contact products, the key to successful mealybug control with BIOPEST® is to get good coverage at the right pest stage.
- BIOPEST® is not a translaminar product, meaning it does not move around within the leaf or bunch. This makes good coverage essential and water rates need to be kept high to ensure this happens.
- Multiple applications targeting the most susceptible crawler stages are required for best results.
- In the 2014 work (see Chart 2), a post-harvest trunk drench targeting crawlers prior to overwintering in bark, followed by foliar applications from bud burst stage as crawlers are becoming active, was most effective.
- Target susceptible stages as follows (See Figures 1 and 2);
  - 1st Instar as post harvest trunk drench.
  - 1st Instar as pre-bud burst trunk drench.
  - 2-3 foliar applications at 10-14 day intervals from bud burst up to 15mm diameter fruit.

Future Research

In addition to undergoing evaluation of BIOPEST® in full organic systems, this season SACOA is currently researching scale control in grapes with BIOPEST® in SA.

Further Information

WA Department of Agriculture and Food
https://www.agric.wa.gov.au/newsletters/win-113
https://www.agric.wa.gov.au/newsletters/win-volume-114

References

AHA Viticulture – SW WA April 2014

Learmonth, S (2005) GWRDC RT04/06-02

Margarey & Hayes – Loxton 2011

University of California http://www.ipm.ucdavis.edu/PMG/GARDEN/FRUIT/PESTS/LIFECYCLE/lcgrmealy.html

Find Out More

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