Henry Manufacturing
non-residual pesticides

BEST PRACTICE

For the use of HML32 to eradicate powdery mildew infections

August 2017

Know how to respond

When powdery mildew infection becomes obvious, it's important to know what action to take. The **three most common errors** made by growers are:

- Just 'keeping an eye on it'. If you can see infection, there are millions of spores you cannot see. Early application gives best results

- The belief that increasing rates of sulphur will assist. Sulphur is an excellent preventative, but next to useless for eradication. There is good science to support this.

- Using the same sprayer set up as used for preventative spraying. Eradication requires a **different** set up and application method – the critical thing is to **safeguard the current season's crop**. Canopy infection is easier to deal with and can be dealt with at another time.

There are two aspects to successful eradication: **the recipe** and the **application method**

THE RECIPE

What is the recipe?

There are now two recipes for eradication of powdery mildew infections.

RECIPE 1

HML32 at 1.25 litres/100 litres tank mixed with:

- Potassium bicarbonate at 300gm/100 litre, and
- Copper at no less than 45gm metallic copper equivalent/100 litre.
  Note: The recommended copper fungicide is Nordox 75WG (60gm/100 litre).

RECIPE 2

HML32 at 1.25 litres/100 litres tank mixed with:

- Sulphur at standard rates, and
- HML Silco (powder) at 425g/100 litres or HML Silco (liquid) at 540 mls/100 litres.

What is the better recipe – HML32 with copper and potassium bicarbonate or HML32 with sulphur and HML Silco?

In terms of eradication both seem to be equally effective. The decision around which one to use is more determined by external factors, such as whether sheep are being used for leaf plucking or perhaps whether downy mildew cover is required at the same time etc.

What type of copper?
Both types of copper provide efficacy. To date Nordox 75WG has provided no mixing issues, whereas there has been the odd issue with one copper hydroxide formulation. Nordox 75WG also has a label claim for powdery mildew whereas the others do not.

Can I add sulphur to Recipe 1?
Trials in 2016 found that adding sulphur to the recipe of HML32, copper and potassium bicarbonate reduced the spray's efficacy by about 20%. It is **not recommended to include sulphur** in this recipe. The spray itself provides very good forward cover, and then protectant sprays can resume at standard timings.

Consultation with wineries
Some wineries are sensitive regarding the use of copper on certain varieties. Therefore it's best to consult with wineries first. Highlight the 'below label' use rate and that you are trying to eradicate highly undesirable powdery mildew. Alternatively, use the recipe of HML32, sulphur and HML Silco.

THE APPLICATION METHOD

The mode of action is contact - so coverage is critical.
The application method depends on whether the powdery mildew is on canopy or fruit and what threat it presents. The overriding motivation should be 'to get ahead of the ball' again; to eradicate infection and then return to disease prevention.

Canopy infection
Very light, early infections can often be eliminated by a high water rate normal (single pass) application using the recipes above. Outcomes should always be checked with high magnification. However, with anything more entrenched, susceptible varieties, denser canopies, or where more 'shadow' areas exist (posts, behind leaves, etc), a more determined regime of a double pass (in both directions) may need to be adopted. These areas typically have low or no spray deposition from previous preventative spraying, which allow infection to develop and thereby provide a source of ongoing sporulation.

Bunch infection
In order for the eradication treatment to be effective, the method of application must be at tractor speeds easily within the capacity of the sprayer to displace the canopy air volume (normally 6.5km/hr or less) with double-pass reverse spraying at **half** the total necessary water rate**, within a smallest practical time period -** so that the second pass enhances the spread of the first application.

Key elements of the **eradication application method** therefore include:

- Water rate
- Bunch exposure
- Spraying direction
- Tractor speed

APPLICATION METHOD FOR ERADICATION

Water rates

High water rates are essential. Good efficacy has been observed by **machine spraying the bunchline** (2 cane VSP) at 500l/ha on 2.4 metre rows with a light canopy (a split of 250/250 if double pass reverse sprayed). For 4 cane VSP, the suggestion would be no less than 760l/ha (380/380 double pass reverse sprayed).

Under normal circumstances water rate could be calculated back on wider row width, but the recommendation is not to. All aspects of application should be maintained above minimum levels for the best possible result.

Tractor speeds

Most spraying systems rapidly lose efficacy over 6.5km/hr. A sprayer audit undertaken by Dr Manktelow in early 2015 confirmed that increasing the water rate had a more positive effect on deposition than reducing tractor speed. Also see results below.

Bunch exposure

The more bunches are exposed, the better the opportunity for the sprayer to provide good coverage. Sunlight by itself also provides some useful efficacy against powdery mildew infections. In almost all cases it is better to wait a day or so for leaf plucking to occur before spraying commences.

What time of day to spray?

Slower drying is thought to provide some advantage. Avoid high temperatures in particular for the recipe with sulphur. Avoid conditions where there is a risk of the plant remaining wet overnight for the recipe that contains copper, as it may russet the berries.

Water stressed vines

Do not spray the canopy of water stressed vines as hardening of the leaves/defoliation may occur.

Sprayer/filters

While these materials generally spray without difficulty, it's best to have clean filters before mixing, and clean water in the lines. Check filters after the first tank to assess any issue. Do not add other products to the spray mix.

How do I know whether I need a repeat application? If I do, how soon should I spray again?

Monitoring infection and efficacy is highly recommended - attach plant tags to specific bunches noting infection and date before spraying and observe daily. Always use high magnification as it is difficult to determine what is residue, dead powdery mildew or live powdery mildew. Trials show

conclusively that 2 applications are better than one, 7 days apart. If double direction spraying not employed on the first application, reverse the direction for the second application.

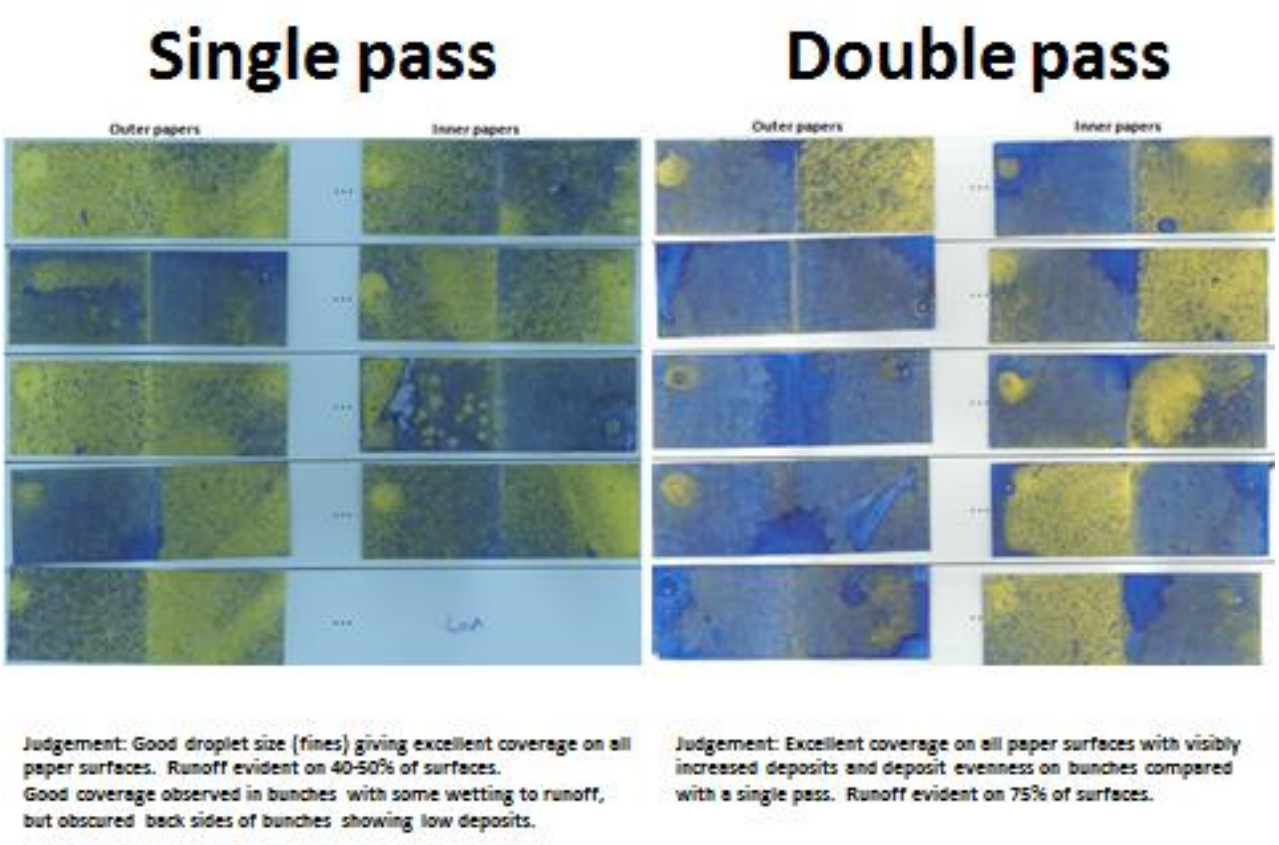
When do I stop spraying?

Berries apparently become resistant to infection when veraison is complete. HML32 by itself, if sprayed after 50% veraison, has the ability to enhance maturity. Read the label and information on our website regarding maturity enhancement **before** spraying after veraison.

MORE ABOUT DOUBLE PASS SPRAYING

This application method improves coverage by enabling the spray to reach the 'shadow' areas. It can be achieved in normal spraying practice by alternating the direction of the sprayer between applications (reverse spraying), or within a single application by double-pass reverse spraying at half the total necessary water rate, within a small time period, so that the second pass enhances the spread of the first application.

An example of improved spray deposition from double-pass reverse spraying is shown in the photos below:



A fuller explanation is available at: [www.henrymanufacturing/Products/HML32/Other publications and papers that may assist/Sprayer study – comparing single pass and reverse pass coverage – Sprayer Audit 2014 – Dr David Manktelow Feb 2014.]

This document is prepared to assist growers in gaining the best performance from use of HML32 and HML Silco for the eradication of powdery mildew infections. Growers are welcome to contact me direct on chrishenry@actrix.co.nz and **027 294 1490** for further queries.

Best of Luck,
Chris