TRI-BASE BLUE

TECHGUIDE

Nufarm

AUSTRALIAN THROUGH & THROUGH

DOWNY MILDEW MANAGEMENT WITH NUFARM TRI-BASE BLUE.

TOP 5 DOWNY MILDEW PREVENTION TIPS

- Prevention is the key, using the best protectant for building the foundations of protection.
- Select the right protectant for your growing conditions and disease pressure.
- Rotate where appropriate and follow guidelines for resistance management.
- Ensure best coverage when applying fungicides.
- Spray as close as possible prior to an infection event.

Nufarm TRI-BASE BLUE®

THE LOWDOWN ON DOWNY MILDEW.

Downy mildew *(Plasmopara viticola)* is a disease that is driven by weather – get the wrong conditions and it can devastate your vineyard. If you don't get the right conditions for infection, you may not even notice the disease.

The good news is that a targeted fungicide program, appropriate to the risk level in your region, can protect your vineyard and ensure you don't suffer undue losses.

WEATHER CONDITIONS FOR DOWNY MILDEW INFECTION.

Outbreak conditions

Downy mildew spores can survive on leaf litter in the soil for 7-10 years, just waiting for the right conditions to germinate and infect your vines. So even if you don't see the disease from year to year, a risk exists for an outbreak of downy mildew if conditions favour disease development.

Downy mildew infection and expression is a two-part process and there is a good rule of thumb for understanding primary infection – **10:10:24** at least 10 mm rainfall, temperatures at least 10°C for a 24-hour period. This describes the ideal conditions for downy mildew infection. These conditions are perfect for spores to be splashed from the soil to the underside of the leaf, germinate and infect the leaf through foliage.

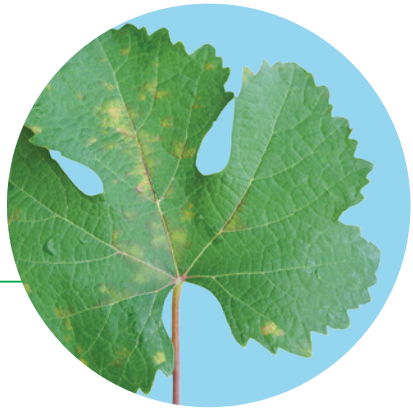
There are a couple of further conditions to consider when determining the risk of infection in any vineyard.

- Downy mildew will only release spores in darkness.
- Downy mildew can only infect green material in the presence of free moisture on the plant surface. So it is possible to have a 10:10:24 event without infection occurring.

Depending on temperature it can take from 5-17 days for symptoms of downy mildew to be seen on the grape leaves. These first symptoms are chlorotic 'oilspots', the typical lesions associated with downy mildew.

Secondary infection, which is leaf to leaf or leaf to bunch infection from oilspots and can be rapidly destructive, requires relative humidity at 98% or greater, temperatures of 13°C or greater and at least 4 hours of darkness. A secondary infection event over one night can trigger huge multiplication of disease, going from 20-50 oilspots to over 100,000 oilspots reducing photosynthetic leaf area or rapidly killing susceptible young bunches.

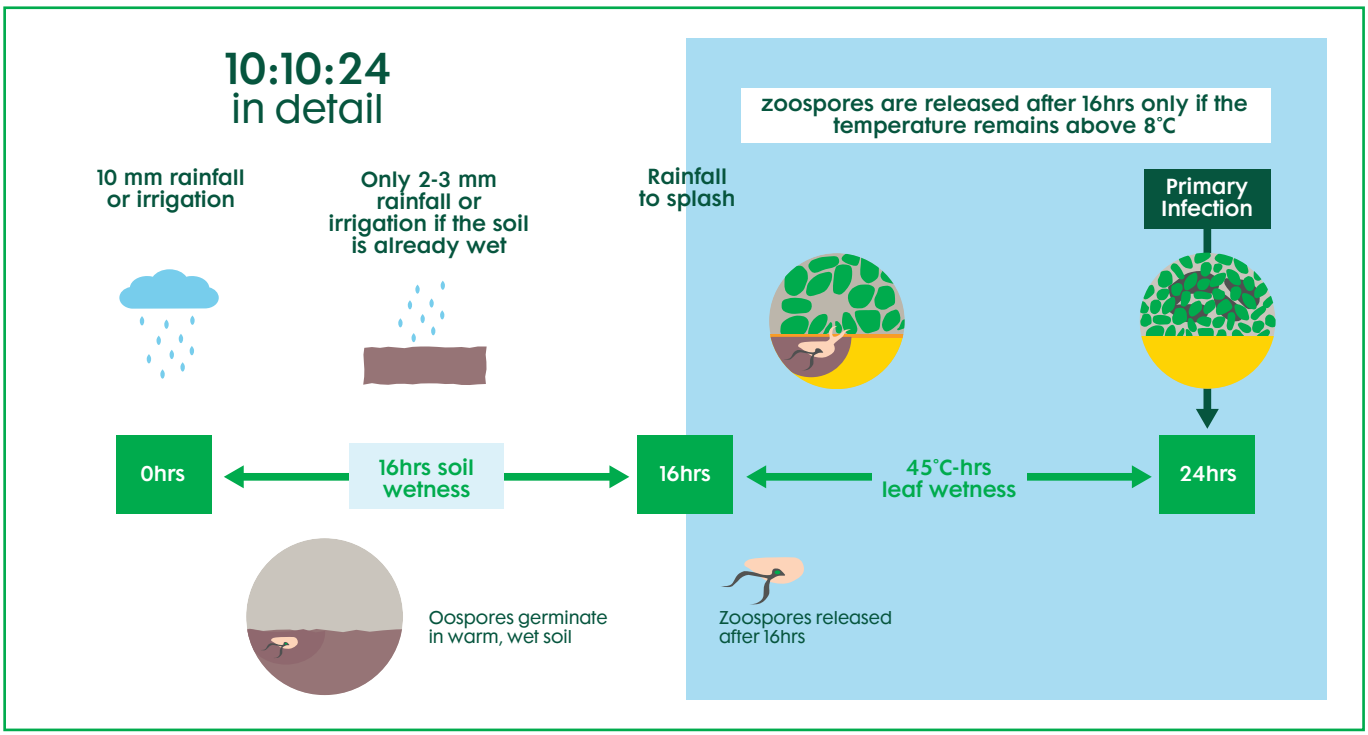
10:10:24 = min 10 mm rainfall / temperatures at least 10°C / for a 24 hr period.

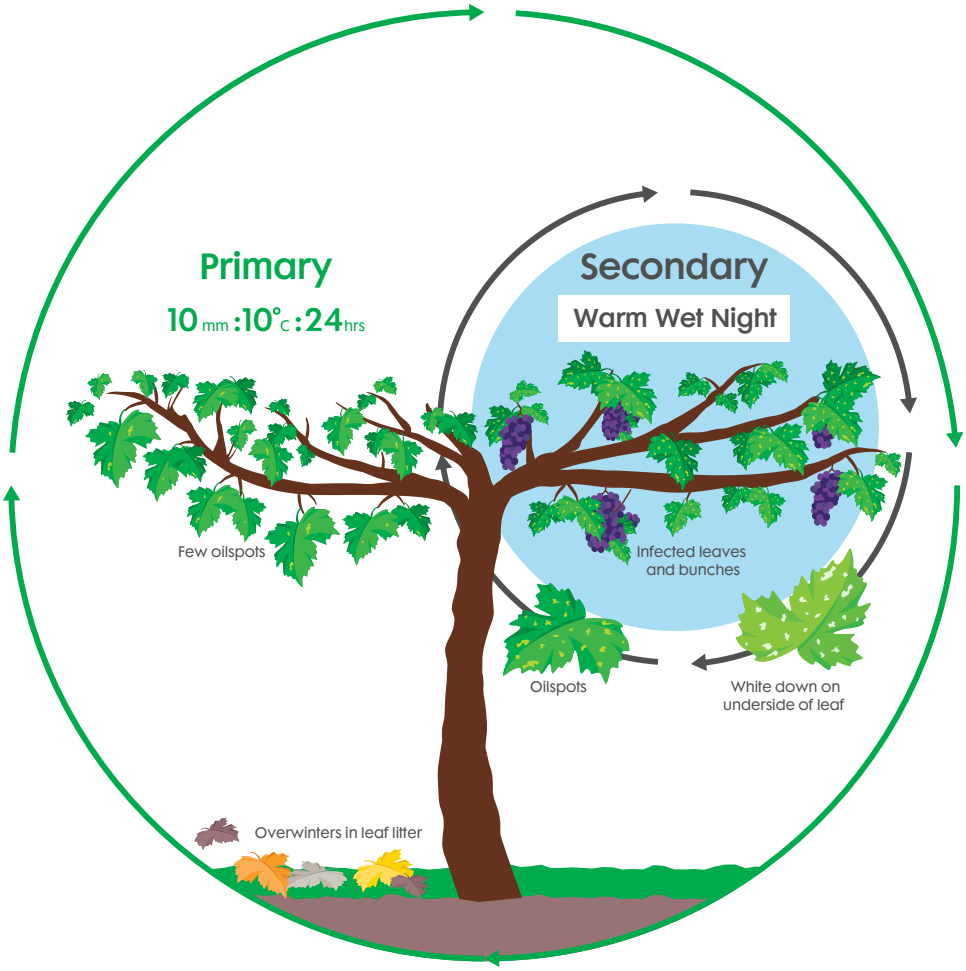


Primary infection
Appearance of an oilspot on the leaf

Primary infection
Sporulation on the underside of an oilspot

PRIMARY AND SECONDARY DOWNY MILDEW INFECTION IN GRAPEVINES.





GET THE BEST RESULTS AND AVOID DISEASE.

Its all about prevention – getting the right fungicides applied, at the right frequency, rotating chemistry to avoid resistance and getting your timing right when high risk conditions occur. It often requires a layered approach, combining surface protecting fungicides with more systemic active ingredients based on seasonal conditions and potential disease loads.

There are over 25 active ingredients or active ingredient combinations suitable for managing downy mildew in wine grapes. It is possible to have a comprehensive program that provides excellent protection, follows best practice downy mildew resistance management strategies and doesn't break the bank.

Nufarm fungicides to manage downy mildew and avoid resistance in grapes.

PRODUCT	GROUP	ORGANIC SUITABLE	MAX. # SPRAYS/SEASON	MAX. # SOLO SPRAYS	MAX. # CONSECUTIVE SPRAYS
Tri-Base Blue	M1	No	N/A	N/A	N/A
Champ DP	M1	No	N/A	N/A	N/A
Champ 500WG	M1	Yes	N/A	N/A	N/A
Barrack 720/ Barrack Betterstick	M5	No	N/A	N/A	2
Amishield	21	No	3	N/A	2
Downright	40	No	4 – Mix (50%)*	2 (50%)*	2
Dragon 700WG	M9	No	N/A	N/A	2

* Do not apply as more than 50% of total number of downy mildew sprays in any season.
Reference: AWRI Agrochemicals registered for use in Australian viticulture.

Surface protecting fungicides form the backbone of a good downy mildew management program. These fungicides create a protective barrier on the outer plant surfaces. These include copper based fungicides like Nufarm Tri-Base Blue or Champ DP, mancozeb based fungicides like Penncozeb or unique multisite actives like Nufarm's Dragon. Surface protecting fungicides are not mobile and require excellent coverage of the plant surfaces to maximise protection.

Copper based fungicides are often all lumped together, however there are significant differences in formulation and the performance of the product as a fungicide. It is really important to make sure you select a copper product that will actually provide the level of protection you are seeking.

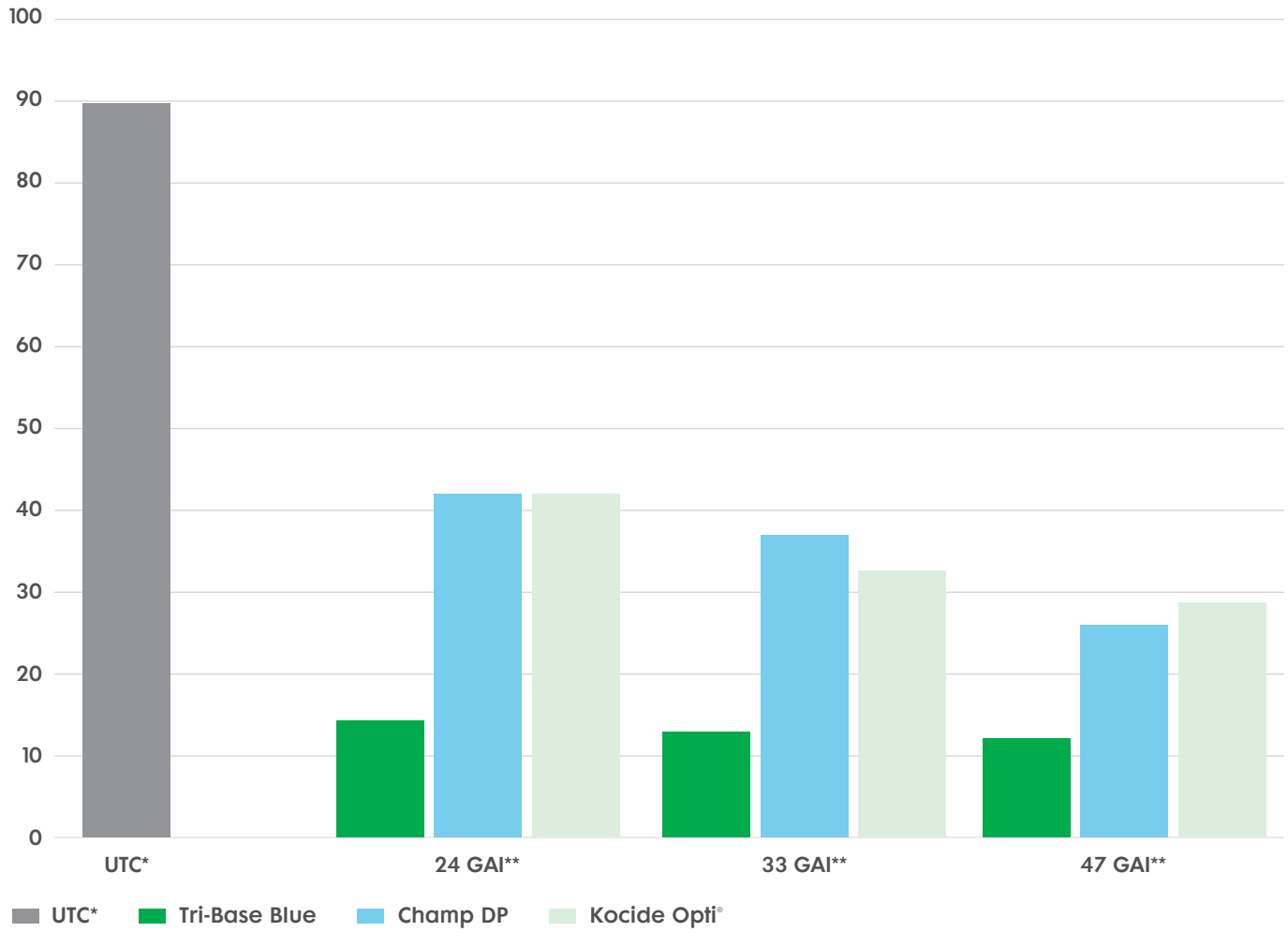
Nufarm Tri-Base Blue provides you with a premium copper product as the strong base for your downy mildew management program and with the new low rate of 125 mL/100 L (24g.a.i.), you can get premium performance without paying a premium price.

As can be seen in figure 1, the performance of Nufarm Tri-Base Blue, with its combination of fast action and slow release copper, is superior to other coppers at twice the rate. This should be the start and the strong base for your program.

Surface protecting fungicides are prone to rub off or dilution as the canopy develops so frequent application may be required to maintain protection levels, with timing to be determined by disease pressure, inoculum levels and climatic conditions. Use of a systemic option like Nufarm's Downright or Amicus Blue in front of a significant period of risk can help to mitigate the risk of the barrier protection being compromised. Reapplying surface protecting fungicides is recommended following significant weather events to re-establish crop cover and protection from infection.

Figure 1: Nufarm Tri-Base Blue performance on downy mildew compared to other coppers

Incidence of downy mildew *(Plasmopara viticola)* on foilage 5DAA6, Yarra Valley, VIC 2017/18



* Untreated control
** Grams active ingredient

TIMING AND TECHNIQUE WITH YOUR SPRAYS FOR BEST EFFECT.

Weather events can lead to the release of downy mildew spores that cause infection, so it is imperative that you have fungicides applied and functioning when these weather events occur. The key is timing the spray as close as possible before an infection can occur and ensuring spray technique achieves coverage on both sides of the leaf.

Using Nufarm Tri-Base Blue will give you effective protection against downy mildew for longer, due to its slow release action, but if a 10:10:24 event is likely to occur you should seriously consider spraying again if it is greater than 7 days since your last application. Remember that copper, like most registered fungicides, is not systemic and will not move so exceptional coverage is a must.

During a time sensitive event like downy mildew, getting over your crop as fast as possible with out compromising coverage is critical. Concentrate spraying, using Designer or Expand super spreaders will allow you to spray quickly and still get the best coverage possible.

As always, if you have any queries about Nufarm's range of products or would like more information about how to manage downy mildew in your vineyard, please contact your local Business Development Manager.

Key points in downy mildew control

- Prevention is the key; use the best protectant for building the foundations of protection
- Select the right protectant for your growing conditions and disease pressure
- Nufarm Tri-Base Blue is the best option for your program
  - Premium performance
  - Wider usage rate of 125-350 mL/100 L
- Rotate where appropriate and follow guidelines for resistance management
- Ensure best coverage when applying fungicides
- Spray as close as possible prior to an infection event
- Using Nufarm's Designer or Expand can allow concentrate spraying without compromising coverage for greater efficiency and rapid response to outbreaks.

Please refer to respective product labels for registered uses in specific crops.

For more information, contact your local Nufarm Business Development Manager

nufarm.com/au/tbb

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