viti-notes

[Effective chemical use]

Research to Practice

A single rate per hectare – why it shouldn't be used

Viti-note Summary:

- Definitions
- How much vine canopy is in a hectare?
- Moving away from a single rate per hectare

Other topics in this Viti-Notes series include:

- Targeting sprays for vineyard pests and diseases
- Maintaining product performance in spray mixes
- Selecting and using spray adjuvants
- Understanding chemical 'modes of action'
- Managing chemical resistance in the vineyard
- Equipment adjustment and evaluation to maximise spray coverage
- *A single rate per hectare – why it shouldn't be used*
- Determining chemical rates for dilute and concentrate spraying
- Determining dilute water volumes for spraying
- Calculating chemical rates for vines

Applying a single chemical rate (i.e. 3 kg per hectare) is unsuitable for vine spraying as canopy size and shape changes through the season. Row spacing may also vary between blocks, altering the area that actually needs to be sprayed (Figure 1). Calculating chemical applications based on ground area (Litres/hectare) has appeal because it is easy to use but this approach is imprecise and can result in applying either too little or too much product to vines. Spray volumes should be varied according to the amount of foliage present to make sure that the right dose is applied to the target.

Definitions

- Dose: Amount of chemical deposited on a target surface such as a leaf or berry measured in mg/cm2. Note: This is not the amount of chemical sprayed per hectare.
- Lethal dose: Amount of chemical required to kill a pest or disease organism, or render it harmless.
- Point of run-off: Situation where most of the vine canopy is covered in spray droplets so that some join together and begin to run over a leaf or berry – in dense, late-season canopies it generally occurs on outer leaves well before inner leaves are wet. Sometimes described as 'thoroughly wet'.

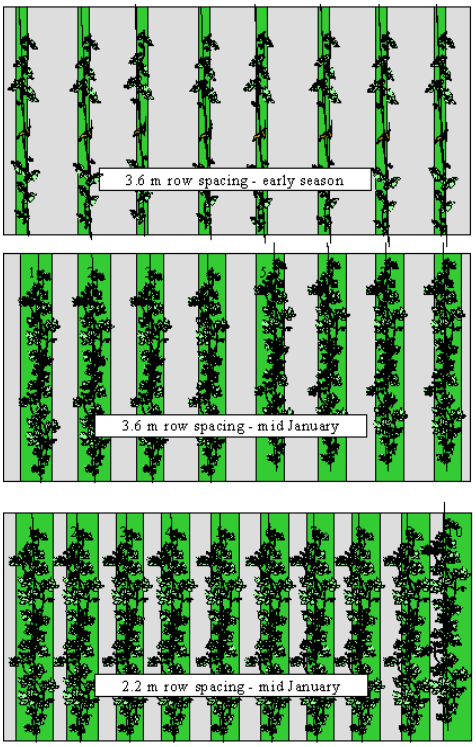

Figure 1. Change in foliage area per hectare due to canopy growth and row spacing.

How much vine canopy is in a hectare?

The amount of vine canopy in a hectare will vary through:

- Changes in canopy size over the growing season;
- Differences in foliage density due to canopy type, irrigation practices, canopy management, variety/ rootstock;
- Changes in amount of foliage per hectare due to different row and vine spacings, i.e. planting density.

During the season, leaf surface area per hectare of ground can increase by a factor of ten while foliage area in different canopies can vary by up to 25 times.

As an example, 2kg/hectare of sulfur may be an appropriate chemical rate at 10cm shoot length, but 3kg/hectare may be needed when berries are pea-size to ensure that the same dose is applied to the canopy at both growth stages. In another example, at the same growth stage, a hectare of small, non-irrigated vertical shoot positioned (VSP) vines in southern Victoria will not need as much chemical as a hectare of large minimally pruned vines grown in the Riverland.

Moving away from a single rate per hectare

Using a fixed spray volume per hectare is comparable to painting different sized houses with equal quantities of paint. By not taking into account the differences in surface area, the coverage cannot be the same. In the vineyard there is a risk of under-dosing large canopies or over-dosing small canopies if a common volume is used.

The single rate per hectare has now mostly disappeared from labels for products used in viticulture. Instead of a chemical rate per hectare (e.g. 3kg/hectare) chemical labels will have a rate per 100 litres of water (e.g. 300g/100L). As a result growers need to determine the amount of water (Litres/hectare) needed to spray their vines to the point of run-off. Viticulturists can now use the new chemical labels to match chemical rates to the size of their vine canopies. This will result in adjusting and increasing chemical rates as the canopy grows over the season. Using the 'rate per 100 litres' together with good target accuracy should result in a constant dose being applied as vines grow.

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Further information

Innovator network factsheets

Spray application by Alison MacGregor

http://www.gwrdc.com.au/webdata/resources/files/GWR_070_Spray_Application_Fact_Sheet_FINAL_WEB.pdf

Training

For regional specific training in pest and disease control, the AWRI is running Research to Practice: Integrated Pest Management for changing viticultural environments.

Contact

Marcel Essling: rtp@awri.com.au for more information.

Agrochemical information

Agrochemicals registered for use in Australian Viticulture - updated annually.

Visit www.awri.com.au for the latest version.

Useful references

Nicholas, P., Magarey, P.A. and Wachtel, M. (Eds.) 1994 Diseases and pests, Grape Production Series 1, Hyde Park Press, Adelaide (a glove box edition of this book is also available).

For images of grapevine symptoms visit www.winetitles.com/diagnosis/index.asp

Product or service information is provided to inform the viticulture sector about available resources and should not be interpreted as an endorsement.

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