viti-notes

[Effective chemical use]

Research to Practice

Determining dilute water volumes for spraying

Viti-note Summary:

- Measuring dilute volumes
  - Test spraying to the point of run- off using vineyard spray equipment
  - Using a knapsack/ backpack sprayer
  - Local knowledge and experience
  - Unit Canopy Row calculations
  - Avcare recommendations

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
- Calculating chemical rates for vines

The water volume that produces coverage to the 'point of run-off' (where the vine canopy is thoroughly wet) is termed the dilute volume. This spray volume is the key in determining the amount of chemical that should be applied to a vine canopy to deposit a lethal dose.

The label rate (of agrochemical) per 100 L (of water) in conjunction with the dilute volume determines the amount of agrochemical that must be applied to the canopy (for dilute or concentrate spraying).

Currently there are three options for determining the dilute volume required for a particular vine canopy:

1. Measure dilute volumes 'in field' by test spraying to the point of run-off.
2. Use vine row volume calculators such as Unit Canopy Row (UCR).
3. Follow Avcare recommendations (Avcare is the National Association for Crop Production and Animal Health).

Measuring dilute volumes

Test spraying to the point of run-off using vineyard spray equipment in field

Firstly set up the spray unit to provide maximum spray coverage. Droplets should cover all parts of the canopy as evenly as possible. If a wetting agent is to be used for spraying then it should be added to the water before test runs begin. Increase or decrease water output until spray liquid can be seen to cover all parts of the canopy to the point of run-off.

If low water volume spray equipment is being used (e.g. air shear sprayer) difficulties often arise mid to late season as the sprayer output is not sufficient to create spray run-off.

Unit Canopy Row calculations

Unit canopy row (UCR) is a method to calculate canopy size and adjust chemical rate to suit. It is a simple method to use and calculates litres per 100 metre of row length (rather than litres per hectare).

One unit of canopy row is defined as a one metre wide x 1 metre high canopy of 100 metre length

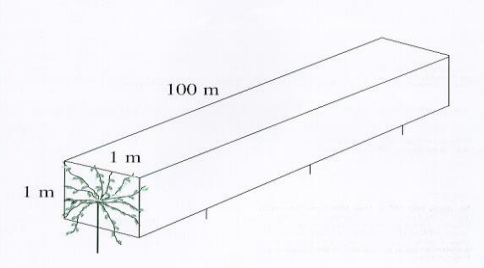

Figure 1. One unit canopy row (UCR).

The UCR is based on the assumption that 30 litres of spray mixture will thoroughly wet a vine canopy that is one metre high by one metre wide and 100 metres in length. The range can vary between 20 to 50 L/UCR, depending on canopy size and density.

Sample calculation:

Dilute spray volume (L/100 m) = 20 to 50 L/UCR x canopy height (m) x canopy width (m)

While the UCR method provide an initial estimate of the dilute spray volume, it is unable to account for the interaction between canopy type, density, weather, sprayer set-up or air output.

Determining dilute water volumes for spraying

Sample calculation:

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Avcare recommendations

Avcare recommendations provide general guidelines for run-off point (dilute volume) for various canopy sizes. They are especially useful for spray units which cannot spray to run-off to calculate dilute volumes. A table of 'indicative dilute volumes' has been developed by Avcare for sprawl and vertically shoot positioned (VSP) canopy types based on vine dimensions.

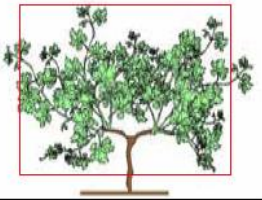
When using these recommendations, the following considerations should be taken into account:

- Select a higher water volume as the canopy size and density increases
- Use some in-field assessment to confirm appropriate volumes for a particular canopy size
- Note any label warnings that specify maximum concentration factors.

Sample calculation:

Dilute spray volume (L/ha)
= L/100 m x 10,000 sq. m/ha ÷ row spacing (m) ÷ 100
= 30 x 10,000 ÷ 2.5 ÷ 100
= 1,200 L/ha (for a 2.5 m row spacing)

INDICATIVE WATER VOLUMES FOR DILUTE SPRAYING GRAPEVINES

SPRAWL CANOPY	Up to 0.5x0.5 m 	Up to 1x1 m 	Up to 1.5x1.5 m 	Up to 2x2m and above 
Indicative volume L/100 m	10 to 20	20 to 40	45 to 60	60 to 90
Indicative volume L/ha (for 3 m row spacing *)	300 to 600	650 to 1,300	1,500 to 2,000	2,000 to 3,000

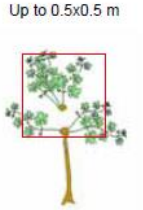
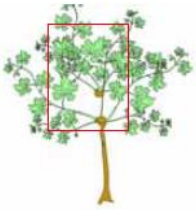
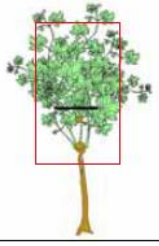
VSP CANOPY	Up to 0.5x0.5 m 	Up to 1x1 m 	"Wires up" stage, up to 1.5x0.5 m 	Up to 2x0.5 m 
Indicative volume L/100 m	10 to 20	20 to 40	30 to 45	45 to 75
Indicative volume L/ha (for 3 m row spacing *)	300 to 600	650 to 1,300	1,000 to 1,500	1,500 to 2,500

Diagram source: Radunz, L (2001) New label directions for spraying – A review of experiences over the past year.

Acknowledgement

The Australian Wine Research Institute would like to acknowledge the Cooperative Research Centre for Viticulture (CRCV) and all involved in the VitiNotes series (1996 - 2006).

Further information

Contact AWRI helpdesk on 08 8313 6600 or helpdesk@awri.com.au

www.awri.com.au

For region-specific training in pest and disease control, contact the AWRI about the Research to Practice module: 'Integrated Pest Management for changing viticultural environments'.

Other resources can also be found on the Wine Australia website: http://research.wineaustralia.com/

Agrochemical information

Information about agrochemicals is published annually by the AWRI in a booklet titled *Agrochemicals registered for use in Australian viticulture*, commonly known as the 'Dog book'. Access the latest version and the app from AWRI website.

The Australian Wine Research Institute

Wine Australia for Australian Wine