

Current topics in this Effective chemical use Vitinotes series include:

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

## Effective chemical use

# 10. Calculating chemical rates for vines

Once the dilute spray volume for a particular situation and stage of vine growth has been determined then it is relatively simple to calculate the amount of chemical to put in the spray tank to ensure a sufficient dose is achieved.

Using another sprayer on your vineyard that produces fine droplets you select a concentrate spray volume of 500L/ha that provides good coverage as well as reasonable work rates.

Values used in sample calculations below	Example
Vine canopy:	Dense late season VSP
Dilute label rate:	10ml/100L (from the chemical label)
Spray tank volume:	2,000 litres
Dilute spray volume to 'thoroughly wet' the canopy being sprayed:	1,500L/ha

### Dilute spraying

For dilute spraying the amount of product specified on the label is added for each 100L of water ensuring then that the tank mix is sprayed to run off.

#### **SAMPLE CALCULATION:**

$$\text{Amount of chemical added to the tank} = 10\text{ml}/100\text{L} \times 2,000\text{L} = 200\text{mL}$$

This tank mix is now sprayed to run off with a spray volume of 1,500L/ha. The chemical application rate can also be calculated:

#### **SAMPLE CALCULATION:**

$$\text{Application rate} = 10\text{ml}/100\text{L} \times 1,500\text{L}/\text{ha} = 150\text{ml}/\text{ha}$$

### Concentrate spraying

For concentrate spraying the appropriate dilute volume for the vine canopy being sprayed is used to calculate the concentrate mixing rate that determines how much chemical to put into the spray tank.

The concentration factor is the dilute spray volume divided by the concentrate spray volume:

#### **SAMPLE CALCULATION:**

$$1500\text{L} \div 500\text{L} = 3 \text{ ie. } 3\text{X}$$

The dilute label rate from the chemical label is 10mL/100L then the concentrate mixing rate becomes

#### **SAMPLE CALCULATION:**

$$3 \times 10\text{mL}/100\text{L} = 30\text{mL}/100\text{L}$$

This then becomes the chemical rate per 10L that is added to the tank.

#### **SAMPLE CALCULATION:**

$$\text{Amount of chemical added to the tank} = 30\text{mL}/100\text{L} \times 2000\text{L} = 600\text{mL}$$

The chemical application rate can also be calculated:

#### **SAMPLE CALCULATION:**

$$\text{Application rate} = 30\text{ml}/100\text{L} \times 500\text{L}/\text{ha} = 150\text{ml}/\text{ha}$$

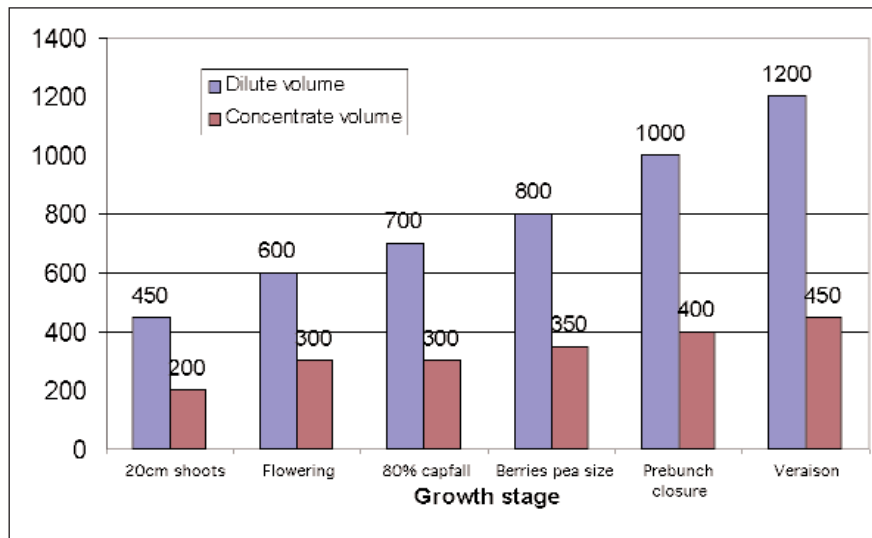
# Viti-Notes

Using both dilute and concentrate spraying results in the same chemical application rate of 150ml/ha. By concentrating the chemical and utilising the coverage potential of fine droplets when concentrate spraying we are able to put out the required application rate in 500L/ha of water instead of 1500L/ha.

CONCENTRATION FACTORS REQUIRED IN DETERMINING A CONCENTRATE MIXING RATE CAN BE CALCULATED WHEN CONCENTRATE SPRAYING ONCE THE DILUTE VOLUME HAS BEEN DETERMINED

## Example

In the example below a grower has determined the dilute volume required to 'thoroughly wet' a vine canopy at six key growth stages. The grower has a large vineyard and uses concentrate spraying to maximise his work rates. The concentrate volumes applied during the season are listed for each growth stage and are sufficient to provide good coverage when the sprayer is adjusted correctly to match the canopy.



The concentration factors at various growth stages can be simply calculated as follows:

- 20cm shoots: Concentration factor =  $450 \div 200 = 2.25X$
- Berries pea size: Concentration factor =  $800 \div 350 = 2.30X$
- Veraison: Concentration factor =  $1200 \div 450 = 2.67X$

In this example if the dilute label rate for a chemical used at veraison is 20g/100L then when concentrate spraying 53g/100L ( $2.67 \times 20\text{g}/100\text{L}$ ) will need to be added to the spray tank to ensure that a sufficient dose is applied to the vine.

### Further information

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

### Useful references:

- Diseases and Pests, editors, Nicholas, P., Magarey, P.A. and Wachtel, M., 1994, Grape Production Series 1, Hyde Park Press, Adelaide, (available Winetitles, 08 8223 4700, or [www.winetitles.com.au](http://www.winetitles.com.au)).
- See also the glove box edition of the above, Field Guide to Diseases and Pests.
- Label Directions for Spraying Vine Canopies. Bayer CropScience August 2003.
- Spray Application Viticulture: Research to Practice® is a training program whose delivery can be fine-tuned to suit each region. Enquiries to Peter Mansfield at Winetac on (08) 8373 7090 or visit [www.crcv.com.au](http://www.crcv.com.au) for more information.

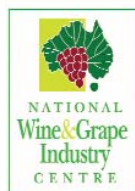
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