

CRC for Viticulture

Pesticide application fact sheet 10



Calculating chemical rates for vines

Once the dilute spray volume has been determined (See *Pesticide fact sheet 9*) then it is relatively simple to calculate the amount of chemical to put in the spray tank to ensure a sufficient dose is achieved.

Sample calculation

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

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

Amount of chemical added to the tank = 10 ml/100L X 2,000 L = 200 mL

This tank mix is now sprayed to run off with a spray volume of 1,500 L/ha

The chemical application rate can also be calculated:

Application rate = 10 ml/100L X 1,500 L/ha = 150 ml/ha

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.

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

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

1500 L ÷ 500 L = 3 ie. 3X

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

3 x 10 mL/100 L = 30 mL/100 L

This then becomes the chemical rate per 100 L that is added to the tank.

Amount of chemical added to the tank = 30 mL/100L X 2000 L = 600 mL

The chemical application rate can also be calculated:

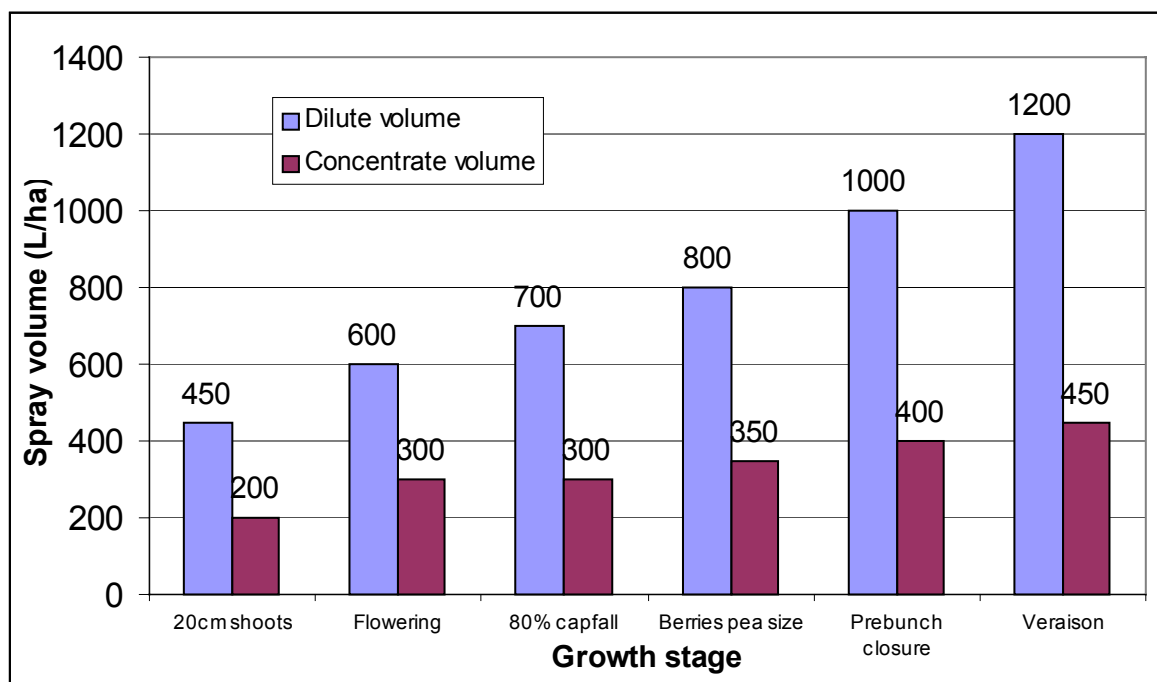
Application rate = 30 ml/100L X 500 L/ha = 150 ml/ha

Using both dilute and concentrate spraying results in the same chemical application rate of 150 ml/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 500 L/ha instead 1500 L/ha.

Concentration factors

Concentration factors required in determining a concentrate mixing rate can be calculated when concentrate spraying once the dilute volume has been determined.

In the example below a grower has determined the dilute volume required to 'thoroughly wet' a vine canopy at six key growth stages when he applies sprays. 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 20 g/100L then when concentrate spraying 53 g/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

- *Spray Application Viticulture: Research to Practice*[®] is a training package that can be fine-tuned to suit regional requirements and includes workshops, short courses and a comprehensive manual.
- *Label Directions for Spraying Vine Canopies*. Bayer CropScience August 2003.