

# Spray management under drought conditions

Alison MacGregor & Yasmin Chalmers, October 2009

It makes sense that growers are thinking about cutting costs, because this season is one of great uncertainty for many wine grape businesses. The spray program is one vineyard activity where you might be thinking of making savings.

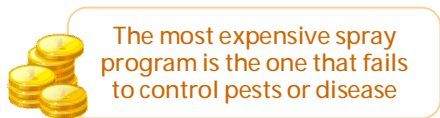
Are you considering cutting sprays out for any of the following reasons?

- To save time (maybe you are working off-farm now).
- To save on chemical and/or fuel costs.
- To save water because water is scarce.
- You have turned the water off and the vines are not producing.
- The crop is not under a contract, so you cannot justify spending anything on it.
- You have not seen black spot, Phomopsis or downy mildew for many seasons, so you cannot justify spraying for these diseases.

If you said YES to any of these points, or even because of other reasons, then make sure you are aware of ALL the implications of your decision.

Consider what really determines the cost of a spray program. Compare the real costs of your spray options. The sprays you apply often might be the cheapest to purchase, but remember that the final cost is also determined by labour, fuel and machinery costs, amounts applied and the number of times you must spray. Don't select a chemical spray program based just on the product purchase price.

Product cost \$/year	=	product purchase price (\$/kg)	x	amount of product applied each spray (kg/area)	x	number of sprays per year	x	cost per spray (labour, fuel, machinery)
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Missing preventative sprays for powdery mildew in October and November can mean that the disease will be rampant from late December onwards. So if you are going to reduce sprays against powdery mildew, don't leave out the early sprays. On the positive side, early control followed by careful monitoring may mean you can leave out powdery mildew sprays after December.

Reducing spray volumes to save water may cause your application to be completely ineffective, unless your machinery is suited to applying a lower volume. A wine grape vineyard receiving six sprays during the season, at 1000L/ha per spray, is using a mere 0.006 ML/ha in the spray tank (<1% of ML). So reducing water volumes per spray is not going to make significant water savings.

Reducing the total number of sprays to save fuel, chemical or time may have justification, but only if you can be sure that the sprays you do apply are effective. An ineffective spray is a totally wasted spray and leaves the vineyard unprotected and vulnerable to disease outbreaks. Make sure you spend time configuring your sprayer to make sure that your settings are effective. Make each spray work.

Your annual costs may not change much if you leave out sprays. During the 2006-07 season, wine grape growers in different regions across Australia are estimated to have spent, on average, \$7000/hectare in operating and overhead costs. On average, chemicals and fuel together represented only 10% of this total cost of production<sup>1</sup>.

Abandoned vineyards pose a disease and weed risk to neighbouring vines. Consider the impact on other productive areas, and on your neighbours' vines, if you are not going to spray a patch of vines that you have turned the water off. Abandoned vineyards can be major sources of disease and weeds, placing great pressure on neighbouring vineyards. For example, mummified bunches on abandoned vines can harbor Botrytis spores, mildew can spread from unsprayed foliage, and wind will spread weed seeds from neglected areas.

Some growers are very smart at schedule spraying to minimize cost and maximize benefit. Ask yourself, which type of grower will you be this season?

1. You are a 'calendar-sprayer', perhaps because you employ someone to spray for you, and it seems simplest to spray every fortnight regardless of disease pressure.	<i>If any of the sprays were unnecessary, or were poorly timed and therefore not entirely effective, then calendar spraying is very expensive in labour, fuel and chemical.</i>
2. You spray when disease and pest monitoring indicates that a spray is required.	<i>This type of grower has to spend precious time monitoring, but the reward is that sprays are well timed and well targeted and the program is cost effective.</i>
3. You use a mix of routine and strategically timed sprays.	<i>Maybe you use some calendar spraying (eg for powdery at 2, 4, 6 &amp; 10 weeks, and for Botrytis at flowering), but also monitor for diseases and pests before deciding to apply any other treatments. Perhaps this season ask yourself whether the routine sprays can be further refined and become more strategic.</i>
4. You are hoping that drought means you can use minimal chemical and do little or no monitoring	<i>You are a big risk taker!!</i>

**Remember the Four T's**

- Timing
- Target
- Treatment
- Technique



<sup>1</sup> Data from 53 winegrape vineyards in Sunraysia, Riverland, Riverina, Barossa, Clare Valley and Fleurieu (Scholefield Robinson 2008. *Capacity Building for Australian Wine Grape Growers*. Project Final Report to Wine Grape Growers Australia).



One well-targeted spray can be more effective than five poorly delivered sprays. One way to save on spray costs is to be careful with targeting the sprayer. Identify the biological target (pest or disease) and the application target (parts of the vine) for each spray, and make sure your sprayer is set up to ensure that you will deliver the spray to the right place. This might mean adjusting the air and nozzle direction, and droplet size. Spraying Table 1 highlights the main application targets for common pest and diseases in Australian vine yards.

Biological target	Application target		
	Early season	Flowering	Post flowering
Beetles/weevils	Soil/vine trunk		
Bud mite	Young shoot		
Grapevine moth	Foliage	Foliage	Foliage
Light brown apple moth	Shoot tips/foliage	Flowers/foliage	Bunches/stalks/foliage
Rust mite	Cordons, canes, spurs, buds	Foliage	Foliage
Black Spot	Whole shoot	Foliage/flowers	Foliage
Botrytis	Whole shoot	Flowers	Bunches
Downy mildew	Foliage (especially underside of leaves)	Foliage/flowers	Foliage/berries/bunch stems
Phomopsis	Whole shoot	Whole shoot	
Powdery mildew	Whole shoot	Foliage/flowers. All green tissue	Foliage/berries/bunch stems. All green tissue.

*Adapted from CRCV (2006) Research to Practice® Spray Application in Viticulture  
www.crcv.com.au*

Now is the time to remember all the key messages about pest and disease management such as;

- Preventative sprays for powdery mildew, particularly around flowering, are the most important sprays
- The conditions for a downy mildew primary infection (10:10:24) or secondary infection (warm wet night).
- The importance of optimizing your spray delivery. Get the right nozzle angles, droplet sizes, air/fan speed, driving speed, and water volume. These affect the spray effectiveness.
- A cheap product applied well is better than an expensive one applied too late.
- Get the Four T's right: Timing, Target, Treatment and Technique.