

# Assessing sun-smart protection

GROWERS SOMETIMES SEE fit to apply products for reasons other than the control of pest and disease. It is part of the AWRI's regulatory role to have at least a basic understanding of any potential impact on fermentation or wine sensory properties, particularly if there is a chance of the product being carried over in or on the fruit. To this end, we sometimes request that manufacturers undertake a study to show that, by following the recommended label rate, the treated sample will not be affected adversely compared with an untreated sample in terms of fundamental fermentation and wine sensory parameters.

It should be stressed that these studies do not seek to ascertain the validity of any claims made by the manufacturer regarding the product and the AWRI advocates a 'buyer beware' approach.

## What is the AWRI position on the use of sunscreen products on grapevines?

There are a range of products based on processed and refined kaolin (Surround®,

Table 1. Spray application trial details for each product.

Product	Rate applied	# Applications	Days before last application and harvest
Parasol®	2.67kg/100L (750L/ha)	2	14
Screen®	5kg/100L (385L/ha)	1	
	1.25kg/100L (480L/ha)	4	35 days
Screen Duo®	1.25kg/100L (385L/ha)	1	
	0.625kg/100L (480L/ha)	4	35 days
Surround WP®	5kg/100L (1140L/ha)	1	14 days

Screen®, Screen Duo®) or calcium carbonate crystals (Parasol®) known as 'sun protection agents' or 'sunscreens'. These are designed to reflect ultraviolet and infrared radiation from plant surfaces. This is said to reduce heat stress and the direct effect of these rays on fruit quality. The products listed in Table 1 have all undergone a basic fermentation and wine sensory study at the AWRI. A comparison of a treated sample with an untreated control found that there

was no significant difference in terms of fermentation or wine sensory properties at the rates and frequencies applied.

## What does the research tell us about particle film technology?

The theory behind particle film technology is that the barrier increases light reflection from the fruit or foliage and, thereby, reduces tissue temperature. It acts as a sunscreen by reflecting the sun's ultraviolet and infrared rays while

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still allowing the photosynthetically-active radiation through for photosynthesis to occur.

Deficit irrigation (DI) is a useful management strategy in many Australian regions. It is used to control shoot vigour and canopy size with most winegrape varieties; and to improve phenolic composition of red grape varieties. As less irrigation is applied than with normally-irrigated vines, water-use efficiency is also improved.

However, for several reasons, leaves and bunches of deficit-irrigated vines may be more susceptible to radiation and heat injury during high temperature events than well-watered vines. First, an increase in bunch exposure is generally the result of DI-induced reduction in canopy size – while this may be beneficial in cool and cloudy climates, this may not be the case in warm to hot and sunny climates. Well-exposed bunches, particularly those on the west side of north-south rows, have been found to experience the most damage during heatwaves. Secondly, although leaves have a natural cooling mechanism – so long as they are actively transpiring because stomates are open – DI leads to some closing of stomates, reduced transpirational cooling and thus higher leaf temperature than for well-watered vines.


Particle film technology (PFT) has been shown to reduce stress in many crops by increasing reflection of foliage and bunches to both infrared and ultraviolet radiation.

#### Can PFT be used on DI vines to reduce leaf and bunch injury during high temperature events?

Research has shown that PFT can reduce leaf and canopy temperature relative to untreated control vines<sup>(1)</sup> and this may potentially reduce leaf injury of DI vines. PFT can also increase water-use efficiency but this is most pronounced with well-watered vines<sup>(1)</sup>. However, if bunches are well exposed on DI vines, PFT may not provide sufficient protection to prevent injury<sup>(2)</sup>. PFT had no significant effect on yield or fruit composition<sup>(1)</sup>.

#### What is the best way to reduce leaf and bunch injury during heatwaves?

Ensure vines are well-watered just before and during heatwaves. Also, use appropriate management strategies to reduce the degree of bunch exposure<sup>(3)</sup>.

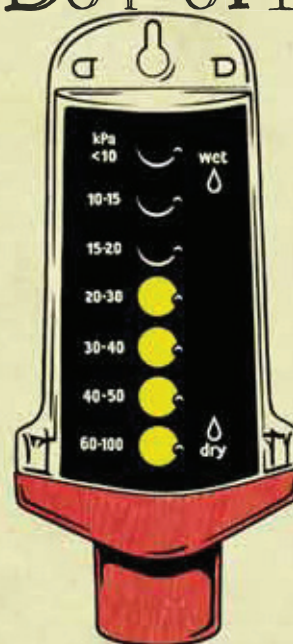
Growers are advised to seek the advice of their grape purchaser prior to the application of any product. 

**Ask the AWRI** is a monthly column that focusses on viticulture and oenology issues in alternate months. AWRI winemaking and viticulture specialists are available to help Australian wine and grape producers. Call on 08 8313 6600 or email at: [winemakingservices@awri.com.au](mailto:winemakingservices@awri.com.au)

#### References:

- <sup>1</sup>. Glenn, D. *et al.* (2010) HortScience 45(8), 1178-1187.
- <sup>2</sup>. Shellee, K. and Glenn, D. (2008) HortScience 43(5), 1392-1397.
- <sup>3</sup>. Dry, P. *et al.* (2009) Aust. N.Z. Wine Ind. J. 24(6), 28-30.

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