

Surround[®] WP

Crop Protectant

**PROTECTION YOU CAN SEE.
PERFORMANCE YOU CAN TRUST**

Plant Surface Protection can mean Higher Quality Wine Grape Yields and a more Profitable Vineyard

Sunburn and heat stress take a toll on vineyards which can ultimately impact both yield and quality of the grapes and the wine produced. Depending on the intensity and length of sunlight exposure and other factors, this damage can range from unseen impact on yield to faint browning of berries, scalding of berries and even complete berry collapse. As part of a planned treatment program, the highly engineered kaolin particles in Surround[®] keep vines and berries cooler, reducing damage by reflecting excessive infrared and ultraviolet radiation from the vine canopy. Sufficient photosynthetic radiation, essential for plant growth, will pass through the Surround particle film. Surround reduces losses from sunburn and heat stress, resulting in increased fruit quality and higher yield potential.

Surround Represents a Breakthrough Opportunity for Plant Surface Protection in Grape Crops

When applied to the crop, Surround covers the plant surface with a protective film layer of highly engineered kaolin particles. Surround is designed specifically to reflect a significant proportion of the light wavelengths responsible for crop damage; infrared, visible light and ultraviolet radiation. Studies have proven that adequate levels of photosynthetic radiation, essential for plant growth, will pass through the Surround particle film.



Proven to Reduce Sunburn Damage by up to 47%

When applied according to label directions, Surround reduces sunburn in grapes by as much as 47%, without negatively impacting on fermentation or wine quality. Damage reduction depends on application rate and timing as well as the severity of sunburn damage and vine characteristics. Sunburn can occur in grapes when air temperatures reach 28°C. Commonly, some grape varieties can lose 20–30% of production to sunburn damage and heat stress with even greater losses in times of extreme heat. Additionally, the indirect costs incurred from unmarketable fruit that is left unpicked or discarded can be substantial. Australian growers have successfully used Surround since 2001 on grapes, apples, plums, onions, pineapples and other fruit and vegetables, establishing significant reductions in sunburn, bleaching and heat stress.

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Engineered Particles Protect Against Heat Stress

Temperatures higher than 28°C can both stress the vine and potentially affect the quality of the fruit. The worst damage occurs when cooler weather precedes high temperatures and the fruit has not acclimatised. The most efficient way to preserve the vineyard is to protect the fruit with Surround and prevent any unexpected exposure of fruit to intense heat and solar radiation. The Surround protective particle film layer can lower peak grape skin temperatures by as much as 8°C, with no negative effect on wine quality or fermentation. Consistent coverage with Surround can also lower vine temperature and thus reduce heat stress on the vineyard overall. Ultimately, this can contribute to a net increase in photosynthesis.



Figure 2. Untreated grapes showing symptoms of sunburn

Surround Reduces Canopy Temperature in Grapes

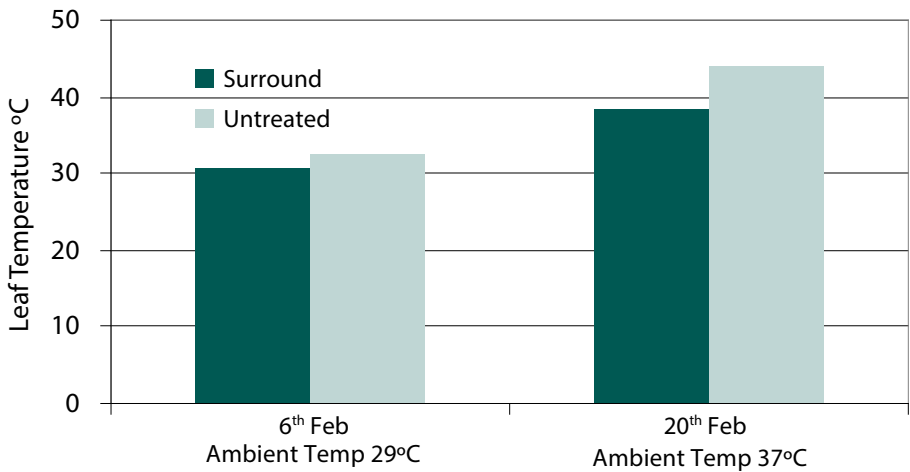


Figure 1. The effect of Surround on grape leaf temperature – Cabernet Sauvignon. University of Melbourne, Dookie Campus. 2005/2006

Surround Protected Significantly More Bunches from Sunburn than those left Untreated

Table 1. Sunburn reduction in Tarango grapes. Swan Hill, Victoria. 2005/2006

Damage rating	Mean % bunches in each category	
	Untreated	Surround
0	6.4	52.5
1–5%	16.9	31.6
6–10%	50.5	14.6
11–25%	22.1	1.2
26–50%	4.4	0.6
51–100%	0.5	0.0



Figure 3. Grapes treated with Surround

Wine Quality – Fermentation and Sensory Analysis

Extensive testing, in the USA and Australia, has proven that using Surround according to label directions has no negative effect on either wine fermentation or on the quality of wine produced. In independent testing by the Australian Wine Research Institute (AWRI) in 2010, a “worst case scenario” was simulated where untreated wine grapes were compared to wine grapes treated with 5 kg Surround per 100 litres of water only 14 days prior to harvest. The results below show no significant negative impacts of Surround on grape or wine quality.

Table 2. Grape quality

Samples	pH	TA g/L	% Sugar
Untreated	3.41a	5.4a	19.1a
Surround	3.38a	5.0a	19.4a

Data followed by the same letter are not significantly different.

TA – titratable acidity (pH 8.2)

Source: AWRI 2010

Table 3. Wine quality

Sample	pH	Alc% (v/v)	VA (g/L)	TA g/L	G+F g/L	SG	FSO ₂ g/L ²	TSO ₂ g/L ²
Untreated	3.30a	11.57a	0.293a	7.23a	0.1a	0.994a	5.00a	87.33a
Surround	3.29a	11.33a	0.310a	7.43a	0.1a	0.994a	5.33a	83.33a

Data followed by the same letter are not significantly different.

VA – volatile acidity; TA – titratable acidity (pH 8.2); G+F – glucose + fructose (residual sugar);

SG – specific gravity; FSO₂ – free sulphur dioxide; TSO₂ – total sulphur dioxide

Source: AWRI 2010

Strategic Application Timing = Effective Protection

As a planned treatment, Surround gives growers the opportunity to improve quality and yield potential markedly. For best results, Surround should be applied before heat events to create a protective white barrier film, and coverage maintained throughout the high heat period. Surround applications will have no effect on sunburn damage that has taken place prior to application.

There is nothing like Surround. Surround provides superior reflection of UV and infrared radiation because of its unique formulation.

The naturally occurring kaolin on which Surround is based is an inert white mineral used in food and toothpaste. In a process of superheating or calcining, the kaolin structure is engineered to reflect more of the sun’s heat and radiation than any other sunscreen product.

The convenient WP formulation provides:

- Easy mixing in water
- Good coverage capacity
- Controlled adhesion to the fruit

Offering all these qualities, Surround represents a real breakthrough in plant surface protection.

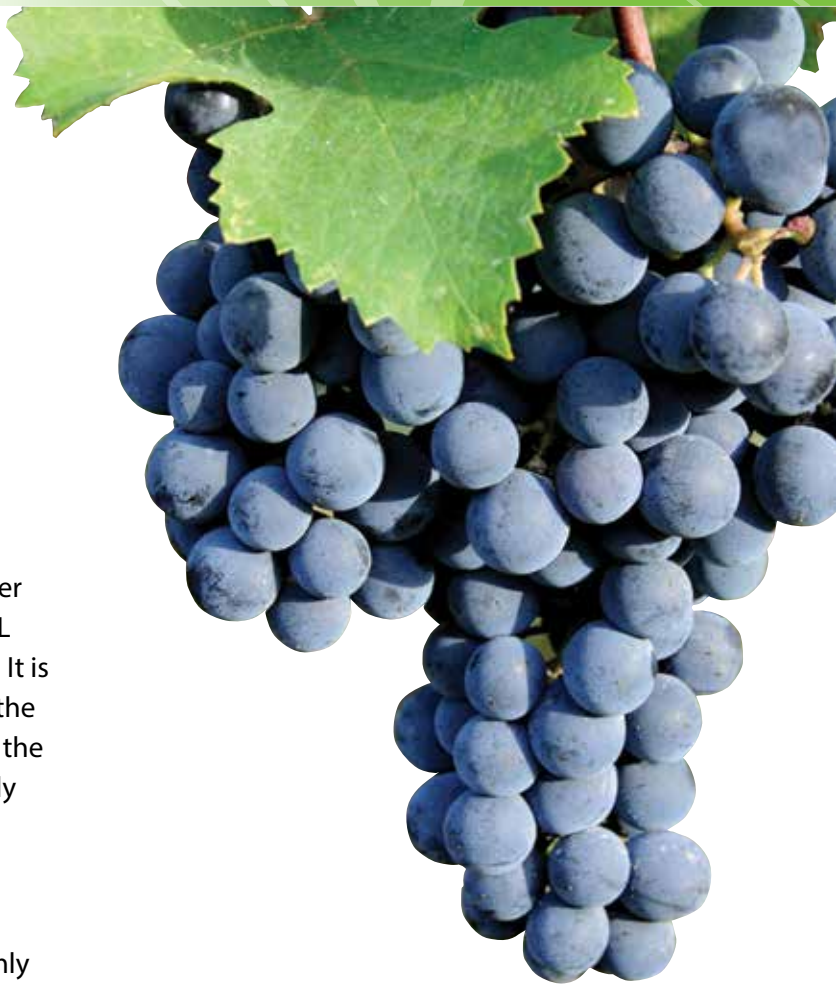
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Recommended Application Rates

- Calibrate sprayer and spray according to vine row volume
- Use 5 kg Surround per 100 litres of water for the first application and 2.5 kg Surround per 100 litres of water for subsequent applications. If desired, the 5 kg/100 L rate can be halved to 2.5 kg/100 L and applied twice. It is imperative that at least 75 kg/ha be applied prior to the first heat event and the coverage maintained during the high heat periods of the season. Surround is generally regarded as inert so applications can be mixed with commonly used protectant fungicides or foliar fertilisers
- Apply at adequate volumes to cover the fruit uniformly (large droplets can run off)
- Re-apply Surround to maintain coverage after heavy rain, wind erosion or new growth (see Figure 3 on page 2)

For Best Results, Maintain Surround Coverage Throughout the Sunburn Season.



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