



Surround® WP

Crop Protectant

**Protection you can see.
Performance you can trust.**

Improve profitability by protecting your crop against sunburn and heat stress...

In the blistering Australian summer, sunburn and heat stress take a toll on orchards, vineyards and other horticultural crops. Under high ambient temperatures, a Surround® program can reduce sunburn and heat stress damage.

Using Surround can improve profitability by:

- ...❖ Increasing plant vigour and yield of many crops.
- ...❖ Reducing canopy temperature and therefore reducing heat and water stress.
- ...❖ Improving fruit colour, soluble solids and size.
- ...❖ Reducing russetting, dropping and cracking of certain fruits.
- ...❖ Increasing fruit quality and marketable yields (packout).

and make every drop of precious water count

A Surround program can improve water use efficiency by:

- ...❖ Reducing canopy temperature and thereby reducing the need for cooling sprays.
- ...❖ Allowing the harvest of more marketable produce from every megalitre of water.

Protection you can see. Performance you can trust.

Surround represents a breakthrough in Plant Surface Protection. Surround covers plant surfaces with a protective white film, a layer of highly engineered kaolin particles that reflect harmful infrared and ultraviolet radiation.

The advanced Particle Film Technology behind Surround crop protectant was developed in the United States and has been used commercially in Australia for many years.

The unique and proven formulation of Surround

- ...❖ Reflects the sun's heat without inhibiting photosynthesis.
- ...❖ Provides good coverage.
- ...❖ Provides controlled adhesion to the plant canopy and fruit.
- ...❖ Tank-mixes with most other crop sprays.
- ...❖ Mixes easily in water.

A secondary use for Surround

Surround forms a very visible white coating where it is sprayed. Another benefit of Surround is it can be used as a very cost effective and easy to use marker to calibrate spray equipment. Do not waste expensive fungicides or insecticides or reduce their effectiveness by incorrect spray coverage. Use Surround to set up your spray equipment correctly.

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Damage from the sun

The sun's heat can cause considerable damage to fruit and vegetable crops. One type of damage is sunburn, the visible damage which begins on the fruit surface. A different type of damage, heat stress, can also cause significant loss. Heat stress is often less noticeable than sunburn but plants undergoing heat stress respond by shutting down the photosynthetic process. When this occurs in late spring, plants can drop some of their fruit load. Heat stress also manifests itself as reduced foliar flushes, especially in young trees.

While sunburn and heat stress are different, they both result from excessive exposure to infrared light from the sun and can be equally devastating in reducing crop quality and yield. The key to reducing damage is decreasing the heat load by maintaining cooler tree and fruit temperatures.

Proven to reduce sunburn damage

The chances of getting sunburn damage increase as air temperatures reach 28°C and above. In Australia some commercial producers report losses of over 20 percent of yield to sunburn damage – with even greater losses in times of extreme heat – and that may not include unmarketable produce left unpicked.

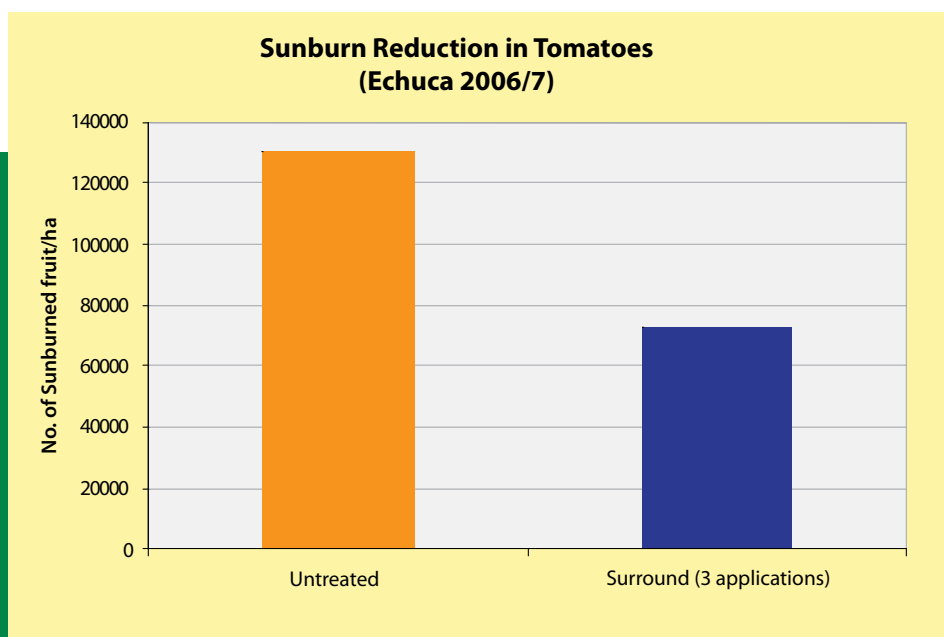
Surround substantially reduces sunburn damage in sunburn-prone varieties or crops. Less sunburn loss can result in a direct yield increase for growers. In fact, use of Surround can provide a benefit even in light sunburn seasons.

How Surround reduces sunburn damage

Surround reflects substantial amounts of infrared (IR) and ultraviolet (UV) light, keeping exposed fruit surfaces markedly cooler while allowing photosynthetically active radiation (PAR) to pass through to leaf and fruit surfaces. The Surround protective coating reduces the intensity of the hot spot where severe sunburn damage occurs.

Young plants or heavily pruned trees can especially benefit from Surround protection because their open structure casts little shade to protect fruit. If irrigation supply is marginal, foliage growth may not be adequate to shade fruit. Surround can be used in such cases to help protect fruit from heat stress and sunburn.

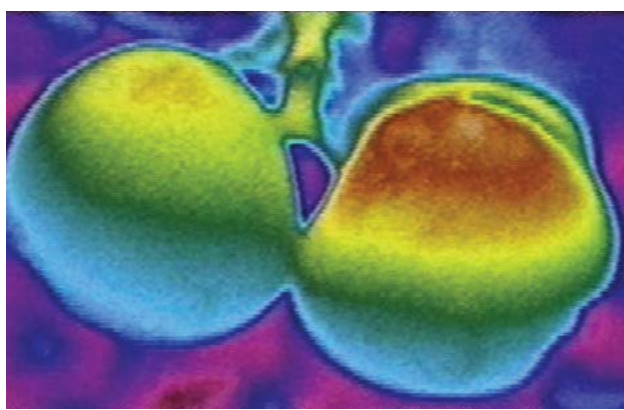
Apply Surround early for maximum
Plant Surface Protection



Heat stress reduction

Heat events including a range of temperatures (IR), high visible light (PAR) and high UV light can cause major damage.

As a general rule temperatures higher than 28° C can stress the plant and damage fruit. The Surround protective particle film layer can reduce plant surface and canopy temperature by 6° C or more. In addition, it will reflect damaging visible and UV light.



Infrared photography – Left: Surround treated apple. Right: Untreated apple. Orange/red indicates the hottest area.

Fruit drop reduction

Protection from heat stress results in increased photosynthesis, thereby providing more carbon for fruit development and retention. Untreated crops in hot early season conditions drop fruit when there is not enough photosynthesis to support high fruit loads. Surround treatments help plants maintain high fruit loads, increasing yield potential.

Using Surround early in the crop's reproductive stage can lessen the risk of fruit drop if high temperatures occur during that period.

For protection against sunburn and heat stress

To protect against sunburn and heat stress, the first application should be made 7 to 10 days ahead of damaging heat events.

Start applications before heat events when fruit becomes susceptible to sunburn and heat stress. Repeat as needed until harvest. Heavy rain, wind erosion and new growth may reduce film effectiveness so Surround may need to be re-applied.

Use at least 50 kg of Surround in 1000 litres of water per hectare to achieve complete coverage. For subsequent applications 25 kg per hectare is normally sufficient.

Surround is made from specially formulated kaolin, an inert, naturally occurring mineral that is used in food and toothpaste.



Apple showing optimum coverage of Surround



Apple needs re-application

Proven commercial results for Australian growers.

Stephen Vigliaturo of Vigliaturo Orchards manages around 30 hectares of trees producing premium quality apples, pears and stone fruit at Ardmona in Victoria.

Mr Vigliaturo said, "Our Surround spray program begins at the start of November with an initial application of 50 kg per hectare. After the initial application we aim to repeat applications whenever it is necessary to keep the fruit covered in the white film."

"We have seen some amazing increases in packout percentage on well managed crops treated with Surround. We have experienced 80-85% reduction in downgraded fruit where we have treated with Surround."



Stephen Vigliaturo

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Directions for use table

TREE CROPS	RATE	COMMENTS
Pome and Stone Fruits and Olives and Grape (Wine)	Initial application 5.0 kg/100 L	Apply the first two applications 7 to 10 days apart and prior to the first heat event. Apply in a water volume according to Tree Row Volume. Refer to Application Guidelines. Cherries – Apply post-harvest only.
Citrus Fruits	Subsequent applications 2.5 kg/100 L	Citrus – Use of Surround in Citrus may result in an increase in Citrus scale numbers. Monitor scale closely and if necessary use registered scale insecticides according to their label instructions. If scale is of concern and use of insecticides is not desirable do not use Surround. On hard-to-wet foliage and fruit such as Mangoes add a non-ionic surfactant/spreader, e.g., Agral® spreader at the recommended spreader label rate to the initial spray, or when reapplying after the film has worn off.
Tropical Crops such as Avocado, Banana and Mango		Mango – Use of Surround in Mangoes may result in an increase in Mango scale numbers. Monitor scale closely and if necessary use registered scale insecticides according to their label instructions. If scale is of concern and use of insecticides is not desirable, do not use Surround.
FIELD CROPS	RATE	COMMENTS
Tomatoes, Cucurbits, Cucumber, Squash, Pumpkin, Rock melon, and Watermelon	Initial application 50 kg/ha	Apply the first two applications 7 to 10 days apart and prior to the first heat event. Increase the volume of water used throughout the season based upon plant size. Reapply at 10 to 14 day intervals as required to maintain an even coverage on the fruit and foliage. Continue treatment as required and maintain cover up to 7 days prior to harvest.
Pineapples	Subsequent applications 25 kg/ha	Cucurbits – apply to smooth-skinned cucurbits only. Refer to I d, Post-harvest Packing and Washing before use. Apply in a water volume of approximately 1000 to 1250 L/ha using a calibrated boom fitted with fan nozzles. Applications near harvest are needed if the ripening fruit changes position as its weight increases. Heavy rainfall, new growth and wind erosion will affect film quality. Reapply to re-establish coverage after heavy rain as soon as the foliage is dry. If the entire cover is lost due to rain, recommence applications at the initial high rate, followed by subsequent applications at the lower rate. For fresh market pineapple, ensure that high pressure forced water sprays adequately remove white residue.

Post-harvest film removal

Surround-treated fruit or vegetables for the fresh market are cleaned after harvest with washing, rinsing, and waxing processes. Growers should conduct small scale trials to ensure that existing dump tanks, brushes and rinsing systems will remove Surround satisfactorily.

An approved cleaning detergent can be added to the dump tank to improve cleaning efficiency.

Some growers have increased the time in the dump tank, changed brush length or shape and increased pressure on rinses to improve the film removal process. Traces of Surround do not affect the quality of processed fruit.

Surround should not be used on crops intended for the fresh market or field packed crops unless provision is made to wash the film from the produce.

For best results, maintain Surround coverage throughout the sunburn season.

Always read the product label prior to opening the packaging.

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