

Innovation. Quality. Solutions.

# 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 in the form of a layer of highly engineered kaolin particles that reflect harmful infrared and ultraviolet radiation.

The advanced Particle Film Technology behind Surround was developed in the United States and has been used commercially in Australia since 2001.

### The Unique and Proven Formulation of Surround

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

### A BONUS use for Surround

Surround forms a highly visible white coating, and cases of poor coverage are therefore easily seen. Hence Surround is an ideal and cost-effective indicator when spraying equipment requires calibration. Correctly calibrated sprayers minimise wastage of crop protection products, and this in turn helps to ensure optimal effectiveness against target pests.



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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, however plants under heat stress respond by shutting down the photosynthetic process. When this occurs in late spring, plants switch to survival mode and 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 result primarily 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% of yield to sunburn damage – with even greater losses in times of extreme heat – and that may not include unmarketable produce left unpicked.

Surround reduces sunburn damage substantially 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

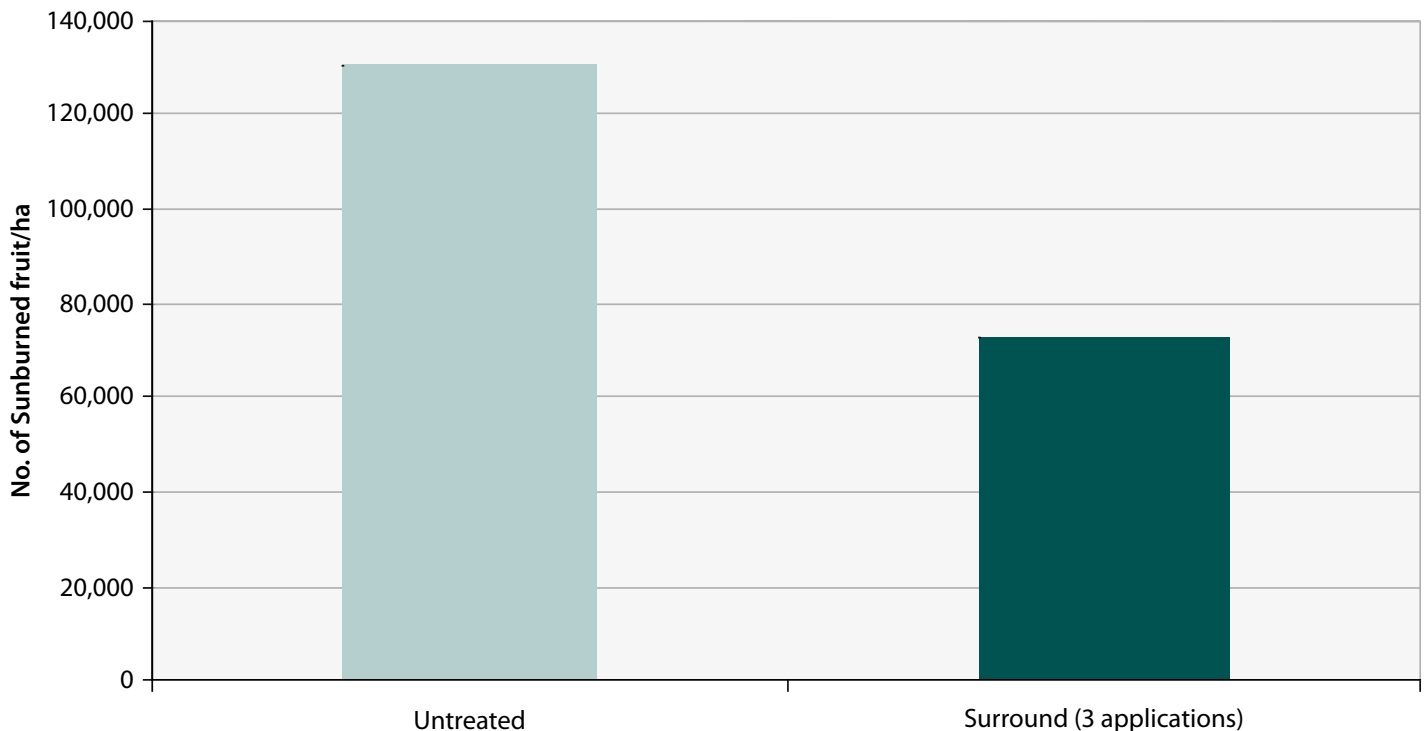
Surround reflects substantial amounts of infrared (IR) and ultraviolet (UV) light, keeping exposed fruit surfaces cooler while allowing photosynthetically active radiation (PAR) to pass through to leaf and fruit surfaces. The Surround protective coating reduces the intensity of the hot spot where severe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

Young plants or heavily pruned trees can particularly 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**

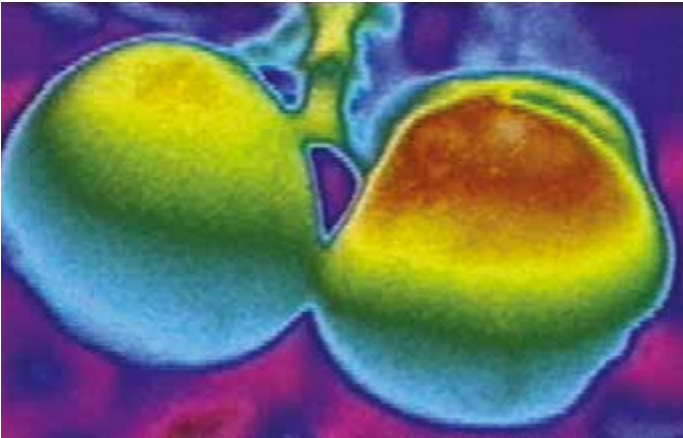
## Surround Reduces the Incidence of Sunburned Tomatoes by Almost 50%

Sunburn Reduction in Tomatoes (Echuca 2006/7)



## Heat Stress Reduction

Periods of hot weather can cause severe damage to plants. 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 visual 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 for optimal fruit development and retention. Untreated crops in hot, early season conditions drop fruit when there is not enough photosynthesis to support high fruit loads. Applications of Surround help plants to maintain high fruit loads, increasing yield potential.

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



Sunburn damage in apples

## 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 is susceptible to sunburn and heat stress. Repeat as needed until harvest. Heavy rain, wind erosion and new growth may reduce film effectiveness, so Surround should be re-applied as required.

Use at least 50 kg of Surround in 1000 L 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 extensively in food and toothpaste.



Apple showing optimum coverage of Surround



Apple needs re-application

## 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 optimise 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.

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### Directions for Use Table

TREE & VINE CROPS	RATE	COMMENTS
Pome and Stone Fruits, Olives and Grapes (wine and table)	Initial application 5.0 kg/100 L	Apply the first two applications 7 to 10 days apart and prior to air temperatures exceeding 28°C. Apply in a water volume according to Tree Row Volume (refer to General Application Guidelines). In Pome Fruit, good thorough coverage should be established by the time fruit are half sized.
Citrus Fruits	Subsequent applications 2.5 kg/100 L	Uniformity of coverage is essential, and may be improved especially on hard to wet foliage and fruit by the addition of an approved non-ionic adjuvant, such as Agral®, or silicone based adjuvant, such as Du-Wett®. Read the adjuvant label thoroughly in order to determine the appropriate adjuvant use rate and volume of water. If a range of rates is allowed, use the minimum recommended use rate.  Grapes - Consult your winemaker before using SURROUND WP. <b>Do not apply SURROUND WP to fresh market grapes after fruit set.</b>  Cherries – Apply prior to fruit set and post-harvest only.  Citrus – Use of SURROUND WP in Citrus may result in decreased activity of Aphytis parasitic wasps, which in turn may increase the levels of Citrus scale. Monitor scale closely and if necessary use registered scale insecticides according to their label instructions. If scale is of concern and the use of insecticides not desirable, do not use SURROUND WP.  Mangoes – Use of SURROUND WP 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 the use of insecticides not desirable, do not use SURROUND WP.
Tropical Crops such as Avocado, Banana and Mango		
FIELD CROPS	RATE	COMMENTS
Tomatoes and Cucurbit Vegetables such as Cucumber, Squash, Pumpkin, Rockmelon and Watermelon.	Initial application 50 kg/ha  Subsequent applications 25 kg/ha	Apply the first two applications 7 to 10 days apart and prior to air temperatures exceeding 28°C. Increase the volume of water used throughout the season based on 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.  Cucurbits – apply to smooth-skinned cucurbits only. Refer to Section I.d Post-harvest Packing and Washing before use.
Pineapples		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 per Section I.d Post-harvest Packing and Washing.

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

The information provided herein may include extracts from the product label and does not constitute the complete directions for use.

**READ THE PRODUCT LABEL THOROUGHLY BEFORE OPENING OR USING SURROUND**

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