

# Surround<sup>®</sup>

## Crop Protectant

### Improved Plant Health and Sunburn Protection

While sunlight is essential for the health of apple orchards, excessive sunlight and heat can take a heavy toll on fruit, increasing stress on trees and reducing apple quality. Surround Crop Protectant provides a proven solution to these environmental factors that affect apple orchards. It covers plant and fruit surfaces to help protect against heat stress for improved water utilization and increased rates of photosynthesis. And, it reduces sunburned fruit, which means higher-quality, more-marketable apples.

### Reduces Temperature of Fruit and Trees

Since 1999, growers in the United States have used Surround with positive results. When applied before severe heat conditions appear and reapplied when needed throughout the hot season, Surround's unique calcined kaolin particles reflect the damaging infrared and ultraviolet radiation that increases plant and fruit surface temperatures, impacting tree health and fruit quality.

Extensive orchard research shows that fruit temperatures of 114 to 120° F can cause sunburn damage. Applications of Surround can lower apple skin temperatures by 10° F or more and tree surface temperatures by 5 to 10° F. In addition, the Surround protective film on plant and fruit surfaces increases the deflection of light within the canopy, which improves fruit color.

### Research Studies Prove Effectiveness

In a 2008 Washington field trial on Granny Smith apples, applications of Surround Crop Protectant reduced sunburn in apples more effectively than competitive brands of particle film (see Table I). More importantly, the Surround-treated trees provided a significant return on the grower's investment (see Table II).

**Table I.** Surround Provides Superior Sun Burn Protection

	# of Sunburned Apples per 400	% Sunburned Apples	
Untreated Check	162.75	40.75	a
<b>Surround</b>	<b>53.00</b>	<b>13.50</b>	<b>c</b>
Raynox <sup>®</sup>	92.75	23.50	b
Eclipse <sup>™</sup>	110.75	27.75	b

Numbers followed by letters are significantly different at p=0.1

**Table II.** Surround Provides a Significant Return on Investment

	Untreated	Surround
Number of Bins Picked/A	30	<b>30</b>
% Sunburn	40%	<b>14%</b>
Number of Marketable Bins/A	18	<b>26</b>
Revenue Per Acre @ \$250/Bin	\$4,500	<b>\$6,500</b>
Average Season Cost/A for Material (5 Sprays)	--	<b>\$150</b>

TESSENDERLO KERLEY, INC.  
2255 North 44th Street  
Suite 300  
Phoenix, AZ 85008-3279

Customer Service:  
1-800-525-2803  
1-602-889-8300

[www.novasource.com](http://www.novasource.com)

## RECOMMENDATIONS FOR APPLES

**Timing:** Apply Surround WP to sunburn-prone fruit, leaf, limb and trunk bark surfaces before conditions leading to sunburn occur. If initiating sprays for sunburn suppression where there have been no prior sprays, provide thorough coverage of all fruit or other plant surfaces prior to sunburn-causing conditions with two full-rate applications 7 days apart. Depending upon the length of the high-heat period, three to four applications in total often are needed, with subsequent applications every 7 to 21 days.

**Concentration:** Use at 25 to 50 lbs (depending on tree size) of Surround WP per acre in sufficient water for complete coverage.

### Application Tips

- Avoid foliage run off. Apply to achieve near-drip coverage.
- Best results are usually achieved at 50 lbs per 100 gallons of water.
- Surfactants may improve spreading.
- Consult the specimen label for instructions on aerial application.
- See Surround Spray Guide for more information on application techniques.

In addition to reducing the percentage of sunburned fruit and reducing heat stress, Surround helps suppress certain insect pests. For more information see the specimen label or visit [www.novasource.com](http://www.novasource.com).

**Special Washing Considerations for Application on Apples:** Washing of apples is recommended unless only early season applications are made and the Surround protective film is allowed to weather off before harvest. Typically, Surround washes off with packing line brushing and forced water sprays. An approved washing detergent is helpful if used in the packing line and/or wash tank. Perform a pre-harvest washing trial to determine if a washing detergent is necessary. Waxing further improves fruit appearance.

For fresh market apples that will not be waxed, such as apples for organic markets or specific export markets that DO NOT accept waxed apples, or for washed crops where traces of white residue are not acceptable, cease applications far in advance of harvest to allow residue to weather off completely.

For Red Delicious and Braeburn apple varieties DO NOT apply any later than two months prior to harvest.

DO NOT apply to orchards cooled with overhead cooling systems.

Important: Always read the label before buying and follow label instructions when using this product.

The use of Surround WP in agricultural crop protection applications is covered by US Patents 6,027,740; 6,069,112; 6,110,867 and 6,156,327.

#### CONDITIONS OF SALE – LIMITED WARRANTY AND LIMITATIONS OF LIABILITY AND REMEDIES

Failure to strictly follow label directions may cause injury to crops, animals, man or the environment. Tessenderlo Kerley, Inc. (TKI) warrants that the product conforms to the chemical description on the label and is reasonably fit for the purpose referred to in the directions for use when properly applied in normal weather conditions. TKI makes no other warranty or representation of any kind, express or implied, concerning the product, including no implied warranty of merchantability or fitness for any particular purpose. The exclusive remedy against TKI for any cause of action relating to the handling or use of the product is a claim for actual out-of-pocket damages, and in no event shall TKI be liable for special, indirect, incidental or consequential damages or expense of any nature, including, but not limited to, loss of profits or income, whether or not based on the negligence of TKI, breach of warranty, strict liability in tort, or any other cause of action. TKI and the seller offer the product, and the buyer and users accept it, subject to the foregoing conditions of sale and limitations of warranty, liability and remedies.

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