

# Surround®

## Crop Protectant

### Use of Surround to Control Sunburn and Heat Stress

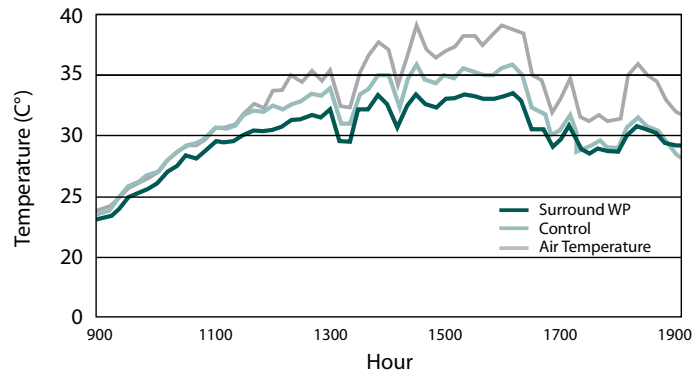
Surround is a recognized tool to protect onions from the damage caused by sunburn at harvest. Early season use of Surround also can protect plants when temperatures exceed optimum ranges. Heat stress can inflict financial losses that frequently go unseen by growers. Surround is specially formulated to reflect harmful infrared and ultraviolet radiation from plant surfaces while allowing penetration of beneficial Photosynthetically Active Radiation (PAR). Surround-treated plants are typically several degrees cooler than untreated plants and a cooler plant leads to: 1) reduced heat stress and more efficient water use, 2) increased photosynthesis and greater plant vigor, and 3) potentially higher yields. And, Surround does not block leaf stomata so gases (O<sub>2</sub> and CO<sub>2</sub>) and water continue to move in and out of the plant, maintaining natural photosynthetic and cooling processes.



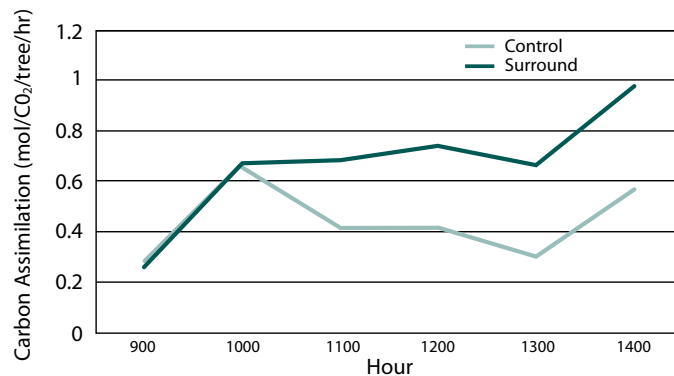
Surround's selective light filtration properties result in cooler plant surfaces and higher rates of photosynthesis (expressed as carbon assimilation)

Glenn, D.M., A. Erez, G.J. Puterka, P. Gundrum. Particle Films Affect Carbon Assimilation and Yield in 'Empire' Apple. J. Amer. Soc. Hort. Sci. 128:356-362. 2003.

Effect of Surround Use on Plant Surface Temperature



Improved Photosynthesis as Measured By Carbon Assimilation



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## RECOMMENDATIONS FOR ONIONS

### For Heat Stress and Insect Suppression

- Surround must be applied prior to heat stress/sunburn conditions.
- Reapply 5–7 days later or as necessary to maintain coverage and protect new growth. (In overhead irrigated fields this may require weekly sprays.)
- Use of Surround also can suppress insect activity, especially thrips. Apply Surround before insects enter the field. If insect pressure exceeds acceptable thresholds then a knockdown insecticide should be used.

### For Post Lifting Sunburn Protection

- First applications must be made immediately after the onions are rolled—when bulbs are first exposed to the sun.
- Thorough coverage is needed to protect the bulbs from sunburn.
- Apply 50 lb per acre in 50 gallons of water or equivalent.
- A second application should be made 5–7 days after the first for best coverage.
- A third spray may be needed if the onions are kept in the field longer than two weeks.

Problem	Lbs/Acre	Application Instruction
Sunburn and heat stress	25-100	Provide thorough coverage of all plant surfaces prior to sunburn-causing conditions with one to 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.

### Application Tips

- Apply Surround to near-drip. Avoid foliage run-off.
- Change the direction of travel on alternate applications for best coverage.
- Surround can be tank mixed with most pesticides. When tank-mixing, always add Surround to the tank first. A pre-mix tank is suggested for sprayers without mechanical agitation.

### Aerial Application

- Use no less than **10 gallons per acre**. Best mixing results are achieved when mixing no more than 1 lb per gallon of water.
- Surround may be applied using standard aerial application nozzles.
- Make applications not more than 10 feet above the top of the largest plant unless a greater height is required for aircraft safety.
- When spraying at low relative humidity, increase droplet size to compensate for evaporation.

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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