

*plant health*



*purshade*®

*protection from sunburn*



*protection from heat stress*



*improved water use efficiency*

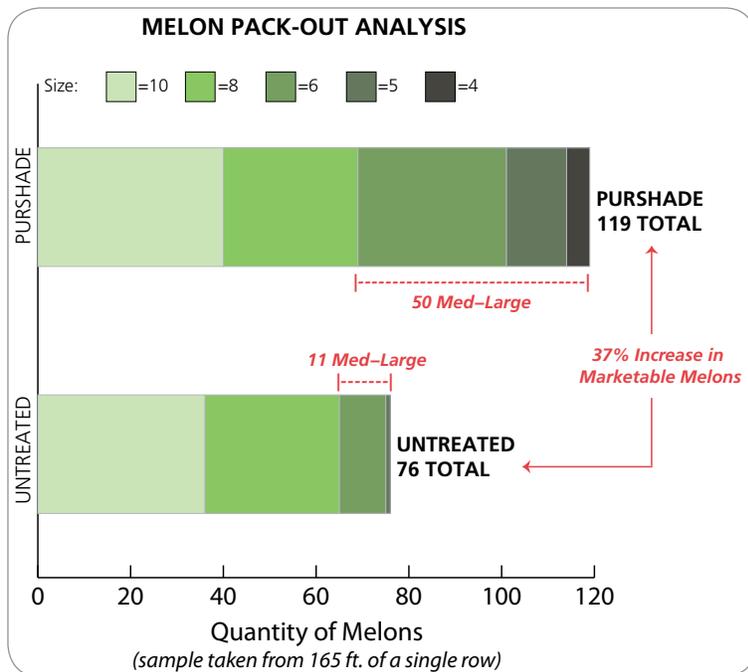
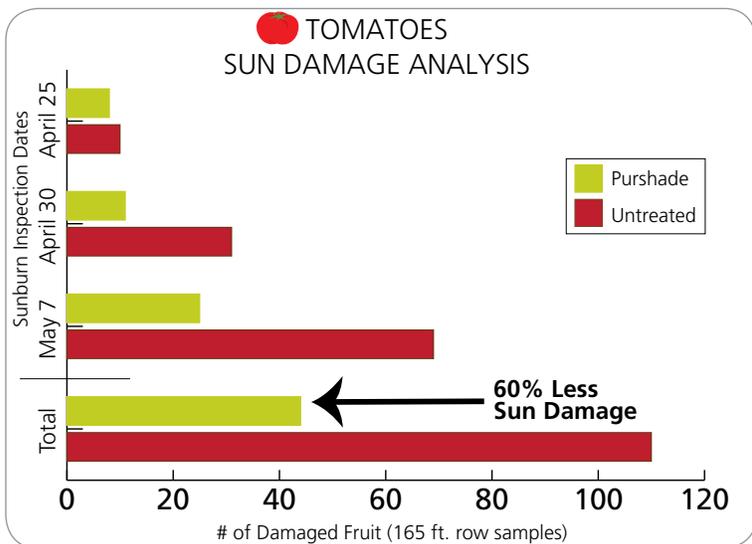
## PROVEN SOLAR PROTECTION

Heat stress and sunburn caused from excessive temperatures and ultraviolet (UV) light can limit crop productivity and damage as much as 50% of a crop, significantly reducing marketable yield and cutting deep into a grower's profit.

Purshade® Solar Protectant reduces solar stress in crops by protecting the plant and fruit from damaging UV radiation and infrared (IR) radiation while still allowing photosynthesis to occur. Engineered with advanced reflectance technology and based on calcium carbonate, a highly reflective mineral, Purshade effectively reflects harmful UV and IR radiation away from plants.

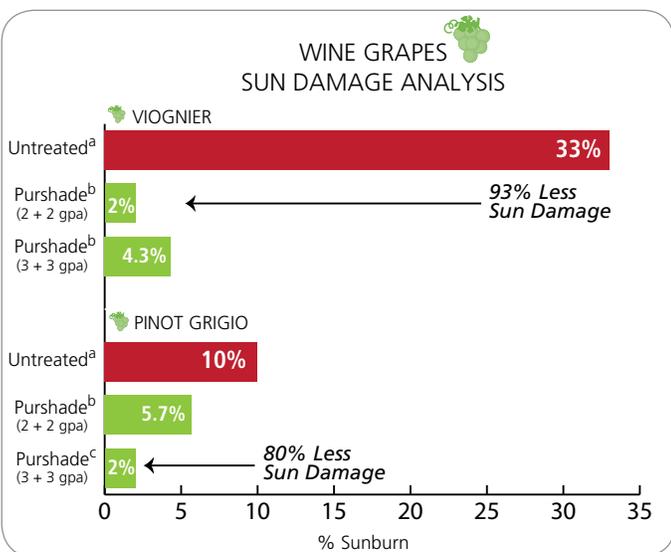
For both young and mature crops, Purshade protection helps maximize the value of every treated acre by:

- Assisting with plant establishment
- Reducing sunburn damage
- Improving water use efficiency
- Minimizing heat stress
- Promoting improved plant health



Sources:

Tomatoes Sun Damage Analysis (upper left)—Arysta LifeScience of Mexico, May 2009.  
 Wine Grapes Sun Damage Analysis (lower left)—Plymouth, CA, 2008; Purshade applied 6/28 & 7/22/2008 in 100 gpa water by air blast sprayer. Sunburn damage evaluated 8/26/2008.  
 Sunburn % was statistically less in the Purshade-treated grapes than in the untreated grapes.  
 Melon Pack-Out Analysis (right)—Arysta LifeScience, Mexico, May 2009.



## THE PURSHADE SCIENCE

Purshade is available in a flowable suspension concentrate that is mixed with water and then sprayed directly on plant surfaces. Once dry, Purshade forms an even film of millions of microscopic “prisms” or mirrors that reflect harmful ultraviolet radiation (UV) and infrared (IR) radiation while not blocking leaf stomata, therefore not impeding photosynthesis. The reflective properties of Purshade protect fruit from direct sunburn damage and help prevent heat stress in the entire crop canopy. Keeping plants cooler, while ambient temperatures are extreme, reduces stress and enables the crop to maintain its normal photosynthetic rate longer. When Purshade is used during periods of high light and temperature extremes, crops have the solar protection needed to better reach their full potential and use available water resources more efficiently.



## USING PURSHADE

Designed with the grower in mind, Purshade comes in an easy-to-handle liquid formulation that tank mixes quickly, applies evenly, and is nonabrasive to equipment. The product can be mixed with crop protection products (jar test recommended) and can be applied with typical ground or aerial sprayers using standard nozzles. Standard post-harvest cleaning and washing processes are generally sufficient to remove the Purshade product from the surfaces of the fruit.



### Application Tips

- Apply Purshade to near-drip. Avoid foliage runoff.
- Purshade is physically compatible with most crop protection products. If compatibility is unknown, perform a jar test before mixing.
- Purshade may be applied in a band spray. Use the recommended rate per acre of Purshade in a quantity of water per acre to achieve complete coverage. Adjust the band width and the volume of water based on plant size to achieve uniform coverage.
- Consult the product label for more information.
- Crops that are to be marketed fresh but have a white film of Purshade remaining at harvest may be washed. Purshade is normally removed with common washing techniques. If the crop is field packed and will not be washed, sprays should be reduced or discontinued in ample time before harvest to allow normal attrition of the film from wind, rain, and plant growth.

*Note: When Purshade applications are discontinued, the crop will begin to lose its protective coating and sunburn protection will be lost.*

## WATER USE EFFICIENCY

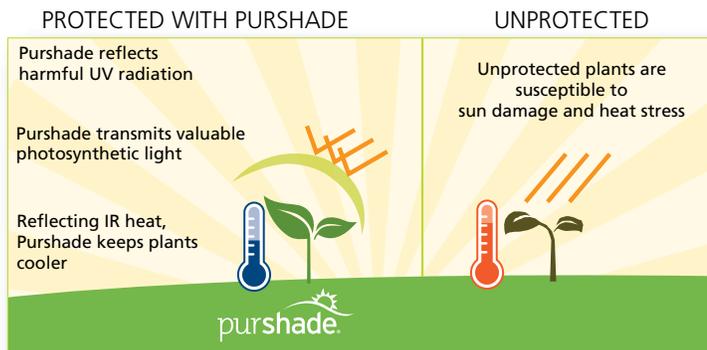
Purshade also represents a breakthrough opportunity to improve the water use efficiency of plants growing under conditions of high light and heat. This improved efficiency often results in improved photosynthesis, plant health, and plant performance.



Three general environmental factors affect the plant's "demand" for water: light, temperature, and relative humidity. If a plant can meet the environmental demand for water, there is no stress and the plant is very productive. However, if the plant is unable to meet the environmental demand for water, then varying degrees of stress will develop. The determining factor for whether a Purshade-treated crop uses more or less water relates to if, and for how long, the plant shuts down and restricts water loss.

When conditions are extreme, the plant's natural defense mechanism to close its stomata to conserve water, and photosynthetic processes are shut down or reduced accordingly. With closed stomata, a plant will use less water, but it will also be less productive and potentially suffer damage.

By reflecting heat-producing infrared (IR) radiation, Purshade helps to keep plants cooler, allowing for more efficient use of available water and enabling photosynthesis to continue for longer periods of time.



Purshade enables the plant to withstand more severe ambient temperatures, therefore prolonging the period in which photosynthesis can take place. When photosynthesis is occurring, the plant continues to use water. In addition, the treated plant continues to grow and manufacture carbohydrates, thereby enhancing its potential for maximum yield.

## Purshade Benefits

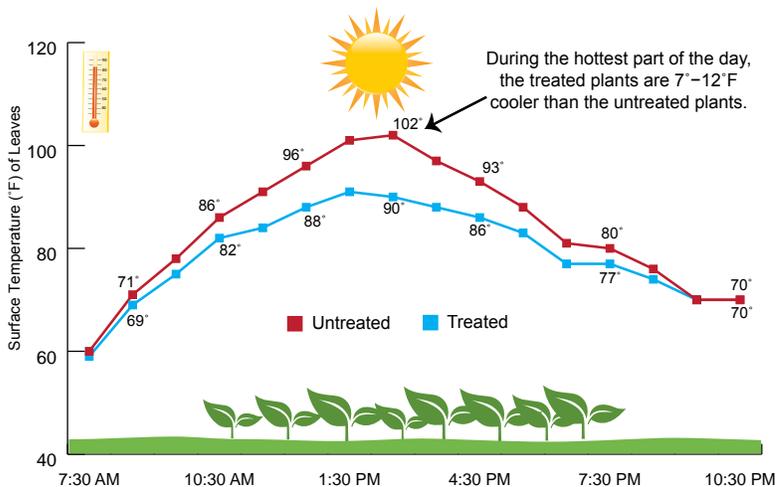
- Reduces damage caused by UV and IR radiation
- Comes in an easy-to-use, nonabrasive liquid formulation
- Reduces heat stress by keeping plants 7°–12°F cooler
- Does not block stomata
- Protects plants at the cellular level by preventing the development of damaging free radicals
- Promotes efficient photosynthesis, improving carbohydrate production and increasing yield
- Tank mixes easily, covers evenly, and can be applied with standard sprayer equipment
- Washes off during standard post-harvest processing



## IMPROVED PLANT HEALTH

Periods of excessive heat and sunlight during critical stages of growth can negatively impact crop quality and overall yields. When ultraviolet (UV) and infrared (IR) light levels rise, and temperatures go beyond optimum levels, heat-stressed plants will wilt, their stomata will close, and photosynthetic processes will stop. When this happens, light energy, which under cooler conditions is used productively by the plants to turn carbon dioxide into carbohydrates, is instead wasted and can even cause the development of free radicals that damage plant cells.

Purshade Solar Protectant coats the plant surface with a protective film that reflects light and heat. This protection helps plants remain as much as 12°F cooler and, on a hot day, allows photosynthesis to continue longer.



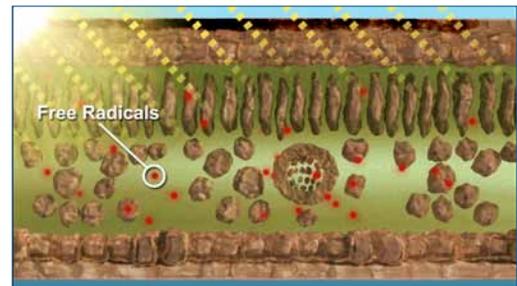
The net benefit of using Purshade during periods of heat stress and intense light radiation is that more carbohydrates are available to be stored in the fruit and to build healthy plant structures, and less energy is needed to maintain and repair the damage caused by extreme heat. This benefit can also be measured in terms of more vigorous plant performance, increased crop yields, and higher-quality produce.

### Plants at Optimum Temperature



Carbon dioxide enters the leaves through stomata. The sugars, lipids, and proteins the plant creates through photosynthesis give the plant the energy it needs to grow and be productive.

### Plants at Extreme High Temperature



Research suggests that a combination of heat stress and light intensity can cause the development of free radicals that are damaging to the plant's cells.

Applying Purshade protects plants from extreme temperatures and, at the cellular level, prevents the production of these harmful free radicals.

## Contact Us

For more information on Purshade Solar Protectant, visit [www.novasource.com](http://www.novasource.com) or call 1.800.525.2803.

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

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

Customer Service:  
1-800-525-2803

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