

Surround[®]

Crop Protectant

Sunburn and Heat Stress in Wine Grape Vineyards

While sunlight is essential for vine growth and grape production, excessive exposure to solar radiation can result in heat stress to vines and sunburn damage to berries. Depending on the intensity and length of sunlight exposure and other factors, this damage can range from unseen impact on yield to faint browning of berries, scalding of berries and even complete berry collapse. The highly engineered kaolin particles in Surround Crop Protectant keep vines and berries cooler and make your crop less prone to damage by reflecting excessive infrared and ultraviolet radiation from the vine canopy.

The Science of Reflecting Light and Heat

Recent research into the causes of sunburn in fruit concludes that sunburn is caused not by a single wavelength of light, but rather by a combination of ultraviolet, visible and infrared radiation (heat) reaching the plant surface. A new study comparing the ability of various sunburn protection products to reflect each of the three forms of incoming radiation shows that Surround is far superior at reflecting the most damaging forms of light radiation to the other tested horticultural sunburn protection products. (For more information on this study see the **Surround Light Reflectance Product Information sheet** at www.novasource.com.)

Heat Stress Affects Berry Health

Prolonged exposure to high temperatures and intense solar radiation damages berries, even those not in direct contact with sunlight. Studies show that when temperatures reach 100°F or higher for more than six hours a day, anthocyanins in the berry skin are reduced. These high heat conditions can result in poor berry color and flavor, increased berry desiccation and lower quality juice. In addition, excessive and prolonged heat can impair photosynthesis by causing plants to close their stomata and shut down the photosynthetic process.

Keeping a Cooler Vine Canopy

Surround is proven to protect berries from direct sunlight and keep grape vine canopies cooler. In numerous vineyard trials where temperatures regularly exceeded 89 to 95°F, Surround reduced the temperatures of treated leaves by 8 to 10°F. A cooler canopy results in greater overall health of the fruit. Studies also have shown that plants treated with Surround keep their stomata open longer than untreated plants. By keeping canopies cooler and prolonging photosynthesis under extreme heat conditions, plants are able to function at their highest potential, resulting in increased plant vigor, higher soluble solids (Brix) and improved fruit color.



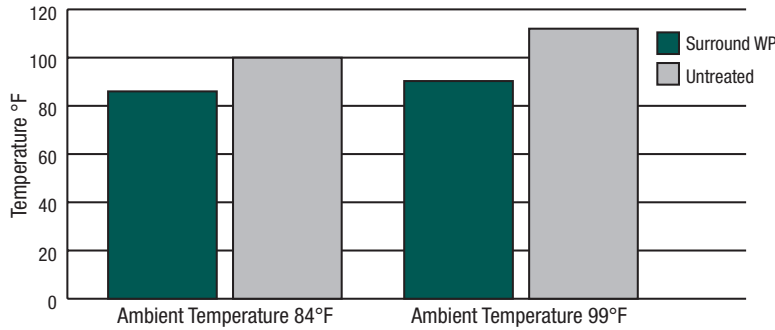
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OMRI[®]
L i s t e d

The Effect of Surround on Grape Leaf Temperature



Surround reduces the leaf temperature of Cabernet Sauvignon leaves.

Surround has been uniquely designed for its ability to:

- Reflect sunlight and heat without inhibiting photosynthesis
- Keep plants cooler
- Allow vines to yield their maximum potential under high heat conditions
- Suppress certain common insect pests of grape vines (see Surround Specimen Label)

Recommendations for Wine Grapes

Timing: Apply 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 and leaf surfaces prior to sunburn-causing conditions with one to two full-rate applications seven 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 of Surround WP per acre in sufficient water for complete coverage.

Application Tips

- Calibrate sprayer and spray according to vine row volume.
- Spray to “near drip” coverage (before the point of runoff).
- Reapply after heavy rain, wind, erosion or new growth.
- Always add Surround before other tank-mix materials.

Special instructions for wine grapes: Harvest parameters can be altered and maturity can be delayed when Surround is used effectively to lower canopy temperatures. This is especially true in white wine varieties. Closely monitor harvest parameters to determine optimal time to harvest. Changes in harvest parameters can affect final taste. Wine grapes sprayed up to veraison will have minimal adherence to berries. Applications after veraison will adhere more on grape berries.

For more information on Surround, visit www.novasource.com.

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