

## Washing Considerations

Kaolin, the active ingredient in Surround® Agricultural Crop Protectant, is approved for use as a food additive at levels up to 2.5 percent, according to the United States Food and Drug Administration (FDA). As well, kaolin is exempted from requirements of a tolerance by the United States Environmental Protection Agency (EPA), under CFR 40, 180.1001(c).

Fruits and vegetables that are to be marketed fresh but have a white film of SURROUND remaining at harvest may be washed to remove the film. Though SURROUND is designed to have moderate adhesion to fruit surfaces the film is normally removed with common washing techniques found in packinghouses.

Field-packed fruit that will not be washed may be applied with SURROUND early in the season for heat stress. The sprays should be discontinued when the fruit are still small. The remaining film coating will eventually weather off the fruit from rain and wind attrition. This attrition will be more pronounced in rainy climates. Note however, that when SURROUND applications are discontinued and the crop begins to lose its protective coating, sunburn protection will be lost.

NovaSource has observed the following techniques and practices that are effective for removing SURROUND from various types of fresh fruit and vegetables. These techniques are not an explicit recommendation and NovaSource advises the consultation of local experts. The use of small test runs to determine the effectiveness of these or other techniques for cleaning fruits and vegetables is recommended.

### Post-Harvest Techniques for Washing SURROUND-Treated Fruits and Vegetables

#### Water Baths and Tank Additives

- Use of acidic dump tank additives (such as 1% citric acid by volume) helps to loosen SURROUND from fruit surfaces. Fruit washing detergents in the packing line also help to loosen the particles of SURROUND. Cleaning agents alone, however, usually do not completely remove the film.
- Holding fruit longer in the dump tank can help wet and loosen SURROUND particles for easier washing when the fruit reaches the physical removal steps in the process. Soaking alone will not remove SURROUND.
- The addition of detergent to water used with cleaning techniques can improve washing efficiency.

#### Brushing and Pressure Washing

- Pressure washing can substantially help cleaning by brushing. Pressure washers used in addition to brushes have proven to be very efficient at removing residual particles from the stem and calyx ends of certain fruit (e.g., apples).
- The number of brushes in the brush bed is important. Effective wet brushing with or without pressure washing is generally the most important part of the cleaning process. For some crops, packing lines with brush beds of more than 50 brushes have proven most effective.

- Slowing the fruit down without decreasing brush revolution speed increases the amount of time the fruit is exposed to brushing, and improves the removal of SURROUND.
- Large-diameter brushes with soft bristles positioned over the top of the washing portion of the brush bed can gently press fruit down onto the cleaning brushes below, thus helping the penetration of cleaning bristles into stem and calyx ends of the fruit. The same benefit can be accomplished by draping sections of wool blankets over the cleaning brushes so that fruit passes under the blanket sections but over the brushes. Extreme care in water management is necessary for this technique, because fabrics like wool can trap fungal spores and promote disease.
- Use of high-low brushes causes fruit to better tumble and better exposes all surfaces to bristles.
- Adjusting cleaning brush revolution speeds, so that every other brush turns at a different speed, can improve cleaning.
- Exercise caution to match brush type, speed, positioning, etc., to accommodate the specific fruit skin conditions of the crop and avoid scuffing or other damage.



**TESSENDERLO KERLEY, INC.**  
2910 North 44th Street  
Suite 100  
Phoenix, AZ 85018-7272

**CUSTOMER SERVICE:**  
800-525-2803  
602-889-8300

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

# WASH GUIDE



**Surround®**  
Agricultural Crop Protectant

## Wax

- Waxes can “clean” indirectly by soaking into the particles and making them transparent.
- Waxes can play a key role in covering any trace amounts of particles if they still persist as a haze on the fruit. Waxes vary in composition. Low viscosity grades are preferred because they more readily soak into any remaining film.

## Crop-Specific Techniques & Precautions

**Apples:** The use of orchard overhead cooling on SURROUND-treated apples causes mineral-laden water deposits that can trap the SURROUND making it very difficult to remove in the packing-house.

**Pears:** The use of lignin sulfonate to float pears in the dump tank can help to remove any SURROUND residues that may be on the fruit.

**Peaches:** Low fuzz peaches can be cleaned on packing lines as described above. Fuzzy peaches will require a detergent or defuzzing agent.

**Citrus:** Typically, normal citrus packing lines adequately remove SURROUND.

**Grapes:** SURROUND-treated wine and juice grapes are suitable for normal processing. Any excess sediment can be filtered out through normal filtration processes. Discontinue the pre-harvest use of SURROUND on table or raisin grapes shortly after fruit formation as washing fruit is impractical and not recommended.

**Tomatoes:** SURROUND applied at the end of the season to prevent sunburn on tomatoes is typically removed through the normal washing and processing of the fruit.

**Onions:** SURROUND used to reduce sunburn in onions at harvest easily falls off as the onions dry and the outer onion layers fall off. Any remaining residues can be removed on the packing line as the onions are processed.

**Cherries:** SURROUND is normally used only post-harvest on cherries.

**Nut Crops:** Applications of SURROUND to nut crops affect only the outer hulls of the crop.

**Olives:** Applications of SURROUND have no adverse effect on olives grown for oil or cannery markets. SURROUND residues are easily removed in both oil and brining processes.

**Organically Grown Fruits and Vegetables:** Consult your organic materials regulating body for approved fruit cleaning products. Plain-water pressure washing and/or brushing can remove film from smooth-skinned fruit.



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

The use of Surround® in agricultural crop protection may be covered by patents held by Tessenderlo Kerley, Inc. For more information, visit [novasource.com](http://novasource.com).

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