



# SURROUND® CF AGRICULTURAL

Crop Protectant

**Surround CF Agricultural Crop Protectant Forms a Barrier Film, Which Acts as a Broad Spectrum Agricultural Crop Protectant for Controlling Damage from Labeled Insect, Mite, and Disease Pests, and Growth Enhancer and Protectant Against Sunburn and Heat Stress.**

## ACTIVE INGREDIENT:

Kaolin ..... 95.0%

OTHER INGREDIENTS ..... 5.0%

Total:..... 100.0%

EPA Reg. No. 61842-16

EPA Est. No. 61842-CA-001

**KEEP OUT OF REACH OF CHILDREN**

## CAUTION

### PRECAUTIONARY STATEMENTS

#### HAZARD TO HUMANS AND DOMESTIC ANIMALS

**CAUTION:** Causes moderate eye irritation. Avoid contact with eyes or clothing. Harmful if inhaled. May cause irritation to the respiratory system. Avoid breathing dust or mist. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove contaminated clothing and wash clothing before reuse.

Manufactured by:  
Tessenderlo Kerley, Inc.  
2910 North 44th Street Suite 100  
Phoenix, AZ 85018  
800-525-2803

**Net Weight: 25 Lbs.**

### FIRST AID

<b>If in Eyes:</b>	<ul style="list-style-type: none"><li>• Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li><li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li><li>• Call a poison control center or doctor for treatment advice.</li></ul>
<b>If Inhaled:</b>	<ul style="list-style-type: none"><li>• Move person to fresh air.</li><li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.</li><li>• Call a poison control center or doctor for further treatment advice.</li></ul>

### HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may contact ProPharma Group at 1-866-374-1975 for emergency medical treatment information 24 hours a day 7 days a week.

## STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage and disposal. **PESTICIDE STORAGE:** Store in a dry, sheltered location. Product is slippery when wet. In case of spill or leak, avoid breathing dust, clean up and dispose of wastes in compliance with applicable Federal, State, and local regulations.

**PESTICIDE DISPOSAL:** Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.

**CONTAINER DISPOSAL:** Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Completely empty bag into application equipment. Then dispose of empty bag in a sanitary landfill or by incineration. If burned, stay out of smoke.

Growth enhancer uses are not registered in California.

The use of Surround® CF in agricultural crop protection applications is covered by US Patents 6,027,740; 6,069,112; 6,110,869 and 6,156,327.

5476-SURCF-0721

## PRECAUTIONARY STATEMENTS

### HAZARD TO HUMANS AND DOMESTIC ANIMALS

**CAUTION:** Causes moderate eye irritation. Avoid contact with eyes or clothing. Harmful if inhaled. May cause irritation to the respiratory system. Avoid breathing dust or mist. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove contaminated clothing and wash clothing before reuse.

### PERSONAL PROTECTIVE EQUIPMENT

Applicators, pickers, and other handlers must wear:

- Long sleeved shirt, long pants
- Socks and shoes
- Protective Eyewear
- A dust/mist-filtering respirator with (MSHA/NIOSH approval number prefix TC-21C), or a NIOSH approved respirator with any N, R, P, or HE filter.

### ENVIRONMENTAL HAZARDS

For terrestrial uses. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash water or rinse.

## DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers can be in the area during application. For any requirements specific to your State or Tribe, consult the state or tribal agency responsible for pesticide regulation.

Do not apply Surround CF through any type of irrigation system.

## AGRICULTURAL USE REQUIREMENTS

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This standard contains requirements for the protection of agricultural workers on farms, in forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment. For any requirements specific to your State or Tribe, consult the State or Tribal agency responsible for pesticide regulation.

The restricted-entry interval (REI) is 4 hours from the time of application. Do not allow worker entry into treated areas during the restricted-entry interval (REI).

Personal-protection equipment required for early entry workers are long-sleeved shirts, long pants, shoes plus socks, protective eyewear and a dust/mist-filtering respirator with (MSHA/NIOSH approval number prefix TC-21C), or a NIOSH approved respirator with any N, R, P, or HE filter.

## I. APPLICATION INSTRUCTIONS

Surround CF protectant forms a mineral-based particle film intended for protection of agricultural crops. When Surround CF is applied to plants, a dry white film results. The Surround CF barrier reduces the damage to plants and crops caused by labeled insects, mites, disease, and environmental stresses such as solar effects. This product is intended as a primary component in pest management systems that utilize supplementary compatible pesticides.

Lack of adhesion or film formation on foliage or fruit indicates spray incompatibility with the plant surface or previously applied materials therefore, do not tank mix with these materials.

Ensure that plant leaf and fruit surfaces are dry before applying or poor adhesion or film formation will occur.

Do not spray where a visible white film is undesirable or cannot be washed off.

The maximum application rate is 100 lbs. Surround CF in 100 gallons of water per acre.

For fresh market crops that will not be washed or for field packed crops where a residual white film is not desired, make applications early-season only. White residue at harvest may be minimized if applications to smooth skin crops like apples stop when the fruit is approximately 1/4 of its expected size.

**Plant Response Precautions:** Surround CF keeps plant surfaces cooler and an advance or delay in maturity can result. Pome and stone fruit can have maturity delays of 3 to 7 days, especially in cool regions.

### a. Mix Instructions:

#### For Agitating Sprayer Tanks

1. Slowly add Surround CF powder into the water in a recirculating sprayer tank, making sure to keep agitation brisk. Do not add Surround CF to a sprayer tank that does not have adequate agitation. A pre-mix tank can speed up loading operations if sprayer does not have mechanical agitation. Add directly into the mix basket if pump recirculation empties into the mix basket. If there is no mix basket, add Surround CF very slowly to the recirculating water. Avoid dumping Surround CF directly into pump intake area as this could plug the filter or intake. Mix thoroughly.
2. Add tank mix pesticides, if any. See compatibility section below before adding any tank mix pesticides.
3. Continue agitation until all of the material is sprayed from the tank.
4. At the end of the application, spray until empty and flush system, and



nozzles, with fresh water. Periodically check in-line strainer and clean if necessary. Properly dispose of rinse water.

### **For Non-agitating Sprayer Tanks, Such as Backpack Sprayers**

The following mixing sequence must be followed:

1. Use Surround CF powder at a rate of  $\frac{1}{4}$  to  $\frac{1}{2}$  pound of Surround CF powder per one gallon of water. One-half pound is approximately 3 cups. For sprayers difficult to shake, premix in a 5 gallon bucket per the directions below and pour suspension into sprayer.
2. Add Surround CF powder into  $\frac{1}{4}$  to  $\frac{1}{2}$  of the water that will be used in the batch to allow adequate space for vigorous shaking. Allow Surround CF to wet and sink into the water slowly. Do not fill with a hose or shake the container while powder is floating on top of the water.
3. Mix thoroughly by shaking the closed container vigorously for 30 seconds.
4. Add tank mix pesticides, if any. See compatibility section below before adding any tank mix.
5. Add the remainder of the batch water and shake the closed container for an additional 30 seconds.
6. Shake the sprayer occasionally during application.
7. At the end of the application, spray until empty and flush system and nozzles or, blow air pressure out of the line and nozzle (usually by up ending) and store in a cool place. Apply the leftover mix within two to three weeks to avoid spoilage, Rinse the sprayer and allow to air-dry before the next batch.

### **b. Compatibility:**

Surround CF is not affected by most other insecticides, miticides, and fungicides. However, to ensure compatibility, test tank mixes before use. When mixing with other products, make up a small batch and observe slurry and film characteristics. Curdling, precipitation, lack of film formation, or changes in viscosity are signs of incompatibility. **Always add tank mix pesticides after the Surround CF powder and spreader/sticker have been added.** Use of anti-foaming agents can interfere with proper coverage.

Tank mixes with pyrethrins, potassium salts of fatty acids and rotenone are generally compatible, but curdling, precipitation, uneven film formation, or changes in viscosity are signs of incompatibility. Test mix compatibility before use. If these conditions occur, do not tank mix Surround CF with these product(s).

### **c. Application Instructions (see, also, specific crop use instructions):**

**Rates:** Rate is dependent on the amount of foliage that needs to be covered.

**Concentration** (the amount of Surround CF per 100 gallons of water): The best concentration of Surround CF is between 25 to 50 pounds Sur-

round CF per 100 gallons ( $\frac{1}{4}$  to  $\frac{1}{2}$  pound Surround CF (or 1.5 to 3 cups of Surround CF) per gallon of water), but concentrations of up to 100 pounds per 100 gallons are allowed for specific crop uses (See sections I.e., II.a., II.d., II.e., and II.h. below).

**Coverage:** Use sufficient spray volume to obtain thorough near-drip coverage. Two or more applications are desirable for complete coverage. For optimal performance as an insecticide, applications must coat all portions of plant that are to be protected, including both sides of the leaves. Apply an additional spray if coverage is insufficient. Spreading on waxy plant surfaces is usually better when the plant surface is warm.

Dwarf, semi-dwarf, and otherwise well-pruned trees will be easier to cover than large trees. Optimum efficacy often is more difficult to achieve in large trees due to increased difficulty achieving thorough coverage.

Applications to tree crops can be made with commercial air blast or high-pressure sprayers that provide enough air turbulence to coat both sides of the leaves, bark, and fruit. The best coverage is achieved at a tractor speed of less than 3 MPH when using airblast sprayers.

**Plant Color Change:** All plant surfaces must turn a hazy white color after drying. Additional treatments will turn the plant surfaces a deeper white. This is normal, and is indicative of appropriate film formation. Generally, two or more coatings are required for complete coverage and for establishment of the foundation of the protective barrier.

**Foliage Dryness:** Apply only to dry foliage. Do not apply to wet foliage or poor coverage and adhesion will result.

**Under Hot, Dry Conditions:** Best results are obtained with nozzles that produce a fine spray when using Surround CF under normal temperature and humidity conditions. Under very hot and dry conditions, increase volume of water and droplet size to improve deposition.

**Spray Methods:** Air blast, high-pressure handgun, or boom sprayers provide the best results. Do not apply by chemigation. Observe specific crop label instructions for directions regarding spray volume. Calibrate spray equipment per equipment manufacturer to deliver the required volume. At given concentrations, the flow rate of suspended Surround CF is similar to water. Strainers, preferably no finer than 40 mesh, in the spray system and behind each nozzle per normal practice helps to reduce nozzle clogging.

**When the dry foliage has lost its white appearance or when gently rubbing the treated area with a dark piece of cloth does not leave a white residue on the cloth, reapplication is necessary.** Heavy rainfall, new growth, and wind erosion will affect film quality. Reapply to re-

establish coverage after heavy rain as soon as the foliage is dry. However, reapplication often is not necessary if all target surfaces remain thoroughly coated and insect pressure is light. Excessively thick coatings can provide poor performance.

**Aerial Application:** Surround CF applied by air will reduce heat stress and sunburn damage if sufficient coverage can be achieved and maintained. Aerial applications often are not effective for controlling insects or diseases. It is best when using aerial applications to take all precautions needed to minimize or eliminate drift, e.g., do not spray under windy or gusty conditions. It is best to make applications not more than ten feet above the top of the largest plant unless a greater height is required for aircraft safety. It is best when making applications at low relative humidity to increase droplet size to compensate for evaporation. Only use spray drift agents, approved by Tessenderlo Kerley, Inc.

**Non-Target Surfaces:** Do not spray where the resulting visible white film will be undesirable or cannot be washed off, such as porous wood, masonry, asphalt, and other valuable goods.

#### **d. Labeled Insect and Mite Control:**

Surround CF is a protectant/repellent that forms a film barrier to labeled insects and mites. For optimum performance, begin application before a particular insect or mite outbreak occurs; thorough coverage must be in place before the pest outbreak. Thorough, uniform, and consistent coverage is essential for effective control.

#### **e. Growth Enhancer, Sunburn and Heatstress Protectant and Light Reflectant:**

When applied at given rates and frequencies, benefits such as increased plant vigor and improved yields typically occur on many crops. Under high ambient temperatures, Surround CF reduces canopy temperature and, therefore, can help to reduce heat and water stress. When Surround CF is used, many fruits have shown improved fruit color, soluble solids, smoothness, and size with less russet, dropping, sunburn, and cracking.

**Sunburn Suppression:** Apply to sunburn-prone fruit, leaf, or 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 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 - 21 days. Good coverage on typical semi-dwarf trees is best achieved with the initial one to two sprays, at 50 pounds in 100 to 200 gallons per acre to achieve near-drip coverage on the fruit or other plant surfaces. However, if allowed (see specific crop group directions), up to 100 pounds/100 gallons are allowed when spray frequencies need to be reduced. Make subsequent applications at half to full rates if even coverage is maintained

throughout the high heat period. Under windy conditions, Surround CF can be rubbed off by leaf movement making reapplication necessary.

**Ground Use:** Surround CF can be sprayed on the ground under crops or between rows of crops per the labeled crop rate in order to increase light reflectance into the crop.

**Aerial Application:** Aerial applications for sunburn and heat stress reduction are best made at concentrations of no more than 1 pound of Surround CF per 1 gallon of water. Use no less than 10 gallons per acre, but on trees 20 or more gallons per acre are preferred. Repeat applications 3 - 4 times per above intervals or as necessary to establish and maintain even coverage on fruit surfaces throughout the high heat period. See aerial applications under l. c.

#### **f. Packing and Processing:**

Washing is required unless films weather off before harvest. Most residues wash off with packing line brushing and forced water sprays. Use an approved washing detergent in the packing line and/or wash tank. Use 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 specific export markets that do not accept waxed apples or for washed crops where traces of white residue are not acceptable: Unless washing facilities are adequate, cease applications enough in advance of harvest to allow residue to weather off completely. For 'Red Delicious' and 'Braeburn' apples varieties do not apply any later than two months prior to harvest.

Information regarding the contents and levels of metals in this product is available on the internet at <http://www.aapfco.org/metals.html>

## II. CROP GROUPS

### a. Tree Fruit

**Volume:** Apply to near-drip. Do not apply to run-off to avoid waste and poor coverage. For typical semi-dwarf trees in full foliage, it is best to use 100 to 200 gallons per acre. Adjust volume per Tree Row Volume to achieve near drip for larger or smaller trees.

**Concentration** (the amount of Surround CF per 100 gallons of water): It is best to use 25 to 50 pounds Surround CF per 100 gallons of water, but concentrations of up to 100 pounds per 100 gallons are allowed. Early applications typically use 37.5 to 50 pounds per 100 gallons of water per acre while follow-up applications may only require 12.5 to 25 pounds (25 pounds is preferred) per 100 gallons of water per acre.

### Pome Fruits

**Such as apple, crabapple, quince, pear and loquat**

PEST	POUNDS SURROUND CF/ACRE	APPLICATION INSTRUCTIONS
Pear psylla	50-100 <sup>1</sup>	<ul style="list-style-type: none"> <li>On mature pear trees 100-200 gallons/acre.</li> <li><b>Prebloom:</b> Apply 3 applications, applying every 7-10 days starting at delayed dormant, but no later than green cluster bud.</li> <li><b>Petal Fall:</b> Apply 3 applications, applying every 7-14 days starting at first petal fall.</li> <li>Spring populations can be reduced with a fall or winter application.</li> </ul>
<b>Insects</b> <b>Pear:</b> cutworms, mealy bug, pear midge, pear rust mite, pear slug, pearleaf blister mite <b>Apple:</b> apple sucker, apple rust mite, climbing cutworm, eastern tent caterpillar, European apple sawfly, Gypsy moth, Japanese beetle, June beetle, lesser appleworm, leafminer/ rosy apple aphid, spirea aphid, tufted apple bud moth <b>Pear and Apple:</b> aphid, crickets, European red mite, grasshoppers, green fruit worm, leafrollers, Lygus bug, Mormon cricket, periodical cicada, San Jose scale, stink bug, tarnished plant bug, thrips, two spotted spider mite, sawfly	25-50	Suppression only.* Start before infestation and continue at 7-14 day intervals. Do not widen respray interval past 14 days.
<b>Apple or Pear Diseases</b> Cedar apple rust, fabrea leafspot, powdery mildew, sooty blotch		Suppression only.* Apply prior to conditions favoring disease development and maintain coverage throughout the disease infection period. Supplements are generally necessary especially in high-pressure areas.
Over-wintering leafrollers, especially obliquebanded leafroller (OBLR)		Apply 2 sprays 7 days apart starting just prior to green tip or at initial emergence of leafroller larvae.



PEST	POUNDS SURROUND CF/ACRE	APPLICATION INSTRUCTIONS
Leafhoppers <sup>2</sup>	25-50	Apply first spray within 3 days of first petal fall or at initial infestation. Continue every 7-14 days during infestation period.
Lacanobia		<ul style="list-style-type: none"><li>• <b>Oviposition:</b> Apply at least one spray at start of oviposition. A second spray within 5-7 days improves efficacy.</li><li>• <b>Egg Hatch:</b> Apply 2-3 sprays starting at initial egg hatch and continuing at 7-day intervals.</li><li>• Using Surround CF or the later generation of lacanobia is allowable if fruit will be thoroughly washed prior to picking or packing.</li></ul>
Apple maggot		Apply 2 sprays 7 days apart before expected oviposition or first detection of infestation. Continue applications every 7-14 days to keep fruit completely covered during egg lay period.
Codling moth (first generation only), oriental fruit moth, plum curculio	25-50	Suppression only.* Apply at biofix or first detection. Continue applications every 7 days to keep fruit completely covered during egg lay period.
Sunburn and heat stress		See l. d.
<sup>1</sup> Rates of 100 pounds in 100 to 200 gallons allowed on pear trees during prebloom for high infestation. <sup>2</sup> Applications at petal fall can sometimes disrupt leaf miner parasitism, requiring control measures. *If complete control is needed, consider using supplemental controls.		

### Horticultural Benefits

Surround CF often enhances fruit quality (see l. d. for general horticultural benefits) if applications start at petal fall and are continued until mid to late season. For petal fall applications, see footnote 2 above about leaf miner. Many pear cultivars, particularly Comice and Anjou varieties have shown improved fruit color, smoothness, and size with less russet when Surround CF is used. Some apple cultivars have shown less bitter pit and corking in season-long programs.

### Diseases

Surround CF sometimes can enhance the efficacy of wettable sulfur and/or lime-sulfur against scab, powdery mildew, sooty blotch, and flyspeck. See Product Guides for specific mixture directions. The use of wettable type sulfurs are preferred, if tank mixing sulfur with Surround CF. Do not tank-mix elemental sulfurs with Surround CF.

### Non-waxed Fresh Apples and Pears (also, see 1.e.)

For fresh market apples and pears that will not be waxed, such as fruit for specific export markets that do not accept waxed fruit: It is best that Surround CF **not** be applied any later than two months prior to harvest as slight traces of white sometimes can still be visible after washing. This especially applies to 'Red Delicious' and 'Braeburn' cultivars.

## Stone Fruit

**Such as apricot, sweet or tart cherries, nectarine, peach, plum, pluot, plumcot<sup>1</sup> and prune**

<b>PEST</b>	<b>POUNDS SURROUND CF/ACRE</b>	<b>APPLICATION INSTRUCTIONS</b>
Japanese beetle, rose chafer	25-50	Suppression only.* Start one week prior to expected infestation and follow with 3 to 4 applications at 5 – 7 day intervals
Oblique banded leafroller (OBLR), thrips		Suppression* only for OBLR. Start at pink bud and continue applications at 5 – 7 day intervals through jacket split.
Leafhoppers including sharpshooters		Suppression only.* Start before expected infestation, if possible. • <b>Until harvest:</b> Apply at 7 – 14 day intervals up to bloom • <b>Post harvest:</b> Apply 2 or more applications at 7 – 14 day intervals
Aphid, cherry fruit flies, crickets, European red mite, European earwig, flathead borer, grasshoppers, June beetle, leafhoppers, lesser peachtree borer, navel orange worm, oriental fruit moth, peachtree borer, peach silver mite, peach twig borer, stink bugs, tarnished plant bug, two-spotted spider mite, tufted apple bud moth		Suppression only.* Start before expected infestation, if possible and continue at 7 – 14 day intervals.
Plum curculio		Suppression only.* Apply at 7 day intervals throughout egg laying period.
Sunburn and heat stress <sup>1</sup>	25-100	See l. d.

\*If complete control is needed, consider using supplemental controls.

<sup>1</sup>Rates of 100 pounds in 100 to 200 gallons allowed for post-harvest sunburn and heat stress use.

### Special Directions

**Special Washing Considerations for Stone Fruit:** For fresh market fruit, special washing is required; especially for fuzzy peaches. Most residues wash off with brushing and forced water sprays. An approved fruit cleaning detergent can be used in packing line and/or wash tank. Prior to brushing, a pre-soak in approved fruit cleaning detergent is usually needed for fuzzy peaches. A pre-harvest washing trial is a good practice to determine if a detergent is necessary. Waxing further improves fruit appearance. If fresh market stone fruit cannot be washed as noted above, discontinue sprays when the fruit are approximately ¾ inch in diameter. Residues of Surround CF do not affect processed fruit quality.

If cherries are for fresh market, discontinue application when fruit are half size (approximately ¼ inch) if no washing is available.

### Citrus Fruits

**Such as lemon, lime, grapefruit, mandarin, satsuma mandarin, pummelo, mandarin, tangelos, kumquat and oranges**

<b>PEST</b>	<b>POUNDS SURROUND CF/ACRE</b>	<b>APPLICATION INSTRUCTIONS</b>
Thrips	50-75 <sup>1</sup>	Start at pre-bloom. Continue at 5 – 7 day intervals throughout bloom. Post-bloom continue at 7 – 14 day intervals through infestation.

PEST	POUNDS SURROUND CF/ACRE	APPLICATION INSTRUCTIONS
Leafhoppers including sharpshooters	50-75 <sup>1</sup>	Suppression only.* • Apply every 7 – 14 days as infestation occurs. • <b>Near-harvest:</b> Apply at least 2 applications 7 days apart for pre-harvest control of sharpshooters
Aphids, citrus leafminer, citrus psyllid, crickets, diaprepes root weevil, grasshoppers, mites		• Suppression only.* Apply every 7 – 14 days as infestation occurs.
Sunburn and heat stress		See l. d.
<sup>1</sup> 50 pounds per 200 gallons per acre preferred for 12 foot trees. *If complete control is needed, consider using supplemental controls.		

#### **b. Nut Crops**

**Volume:** Apply to **near-drip**, not to excessive run-off. For 20-foot trees, it is best to use 200 gallons per acre. Large trees like walnut and pecan can require up to 300 gallons per acre.

**Concentration** (the amount of Surround CF per 100 gallons of water): It is best to use 25 to 50 pounds Surround CF per 100 gallons of water.

#### **Tree Nuts**

**Such as almond, beech nut, Brazil nut, butternut, chestnut, cashew, filbert, hickory nut, macadamia nut, pecan, walnut and including pistachio**

PEST	POUNDS SURROUND CF/ACRE	APPLICATION INSTRUCTIONS
Aphids such as pecan, black, and yellow aphid, codling moth, crickets, grasshoppers, husk fly, leafhoppers, mites, naval orangeworm, peach twigborer, stink bug	50-75 <sup>1</sup>	Suppression only.* Start at biofix or as infestation occurs. Apply every 7 – 14 days throughout infestation. For codling moth, apply a minimum of 2 sprays per generation.
Sunburn and heat stress		See I. d.
<sup>1</sup> 50 pounds per 200 gallons per acre preferred. *If complete control is needed, consider using supplemental controls.		

#### **c. Small Fruits**

**Volume:** Apply to near-drip. Do not apply to run-off to avoid waste and poor coverage. The volume of water/acre required will increase throughout the growing season in relationship to the increasing size of the crop and its foliage.

**Concentration** (the amount of Surround CF per 100 gallons of water): It is best to use 25 to 50 pounds Surround CF per 100 gallons of water.



### Berries

**Such as blackberry, raspberry, dewberry, boysenberry, loganberry, elderberry, blueberry, ribes such as currant and gooseberry and including cranberry**

PEST	POUNDS SURROUND CF/ACRE	APPLICATION INSTRUCTIONS
Blackberry psyllid, crickets, European raspberry aphid, European red mite, grasshoppers, Japanese beetle, leafhoppers, leafrollers, plum curculio, rose chafer, two-spotted spider mite, thrips	25-50 <sup>1</sup>	Suppression only.* Begin applications after fruit set and prior to infestation, applying every 7 – 14 days.
Blueberry maggot		Suppression only.* Apply 2 sprays 7 days apart before expected infestation or first detection of infestation. Continue applications every 7 – 14 days during egg lay period.
Sunburn and heat stress		See l. d.
<sup>1</sup> 25 pounds per 50 gallons per acre preferred *If complete control is needed, consider using supplemental controls.		

### Special Directions

Apply on fresh market berries only up to the first three weeks after fruit set as trace residues can be difficult to remove after harvest. Application of plain water via normal sprayer prior to harvest can help to reduce Surround CF residues. Processing blueberries can be washed using detergent and water sprayers capable of rinsing away residues in the packing line. Minor residues of Surround CF on blueberries for processing are acceptable provided no other pesticides are also present.

### Grapes

PEST	POUNDS SURROUND CF/ACRE	APPLICATION INSTRUCTIONS
Thrips	25-50 <sup>1</sup>	Apply 1 – 2 applications 7 days apart when pest reaches treatment threshold.
Crickets, European red mite, two-spotted spider mite, rose chafer, omnivorous leafroller, grape berry moth, grape bud beetle, grape leafroller, grape leaf folder, grasshoppers, grape leaf skeletonizer, Hoplia beetle, orange tortrix, Japanese beetle, June beetle, Mexican fruit fly		Suppression only.* Start at biofix or as infestation occurs, applying a minimum of 2 – 3 applications by applying every 7 – 14 days.
Leafhoppers including sharpshooter		Apply initial application as infestation occurs, applying at least 2 – 3 applications by applying every 7 – 14 days throughout the infestation.
Sunburn and heat stress		See I. d.
<sup>1</sup> 25 pounds per 50 gallons per acre preferred *If complete control is needed, consider using supplemental controls.		

### Special Directions

**Wine grapes:** Harvest parameters can be altered and maturity can be delayed especially 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.

**Raisin grapes:** It is best that raisin grapes be sprayed only up to bunch closing, then can be continued post harvest.

**Table grapes:** Do not spray table grapes from first bloom to harvest as white residue can remain on the rachis and fruit until harvest. Infestations can be sprayed up to first bloom, and again after harvest.

### d. Field Vegetables

**Volume:** Apply to near-drip. Do not apply to run-off to avoid waste and poor coverage. The volume of water/acre required will increase throughout the growing season in relationship to the increasing size of the crop and its foliage. Seedlings will need less water and a lower amount of Surround CF than fully mature plants to uniformly coat their surfaces. Adjust the volume of water and rate used throughout the season based upon plant size. Lower volumes and rates are typically used only for immature plants.

**Concentration** (the amount of Surround CF per 100 gallons of water): It is best to use 25 to 50 pounds Surround CF per 100 gallons of water.

### Legume Vegetables Such as beans, pea, chickpea, and soybean

PEST	POUNDS SURROUND CF/ACRE	APPLICATION INSTRUCTIONS
Alfalfa looper, aphids, bean leaf beetle, crickets, European red mite, fall armyworm, flea beetles, grasshoppers, Japanese beetle, leafhoppers, Lygus bug, Mexican bean beetle, stink bug, tarnished plant bug, three cornered alfalfa hopper, thrips, two-spotted spider mite, velvetbean caterpillar	25-50	Suppression only.* Start prior to infestation, applying every 7 – 14 days throughout infestation.
Sunburn and heat stress	25-100	See l. d.
*If complete control is needed, consider using supplemental controls.		

### Special Directions

Only spray beans that are difficult to wash, such as string beans, when beans are small. Do not apply to other field and garden vegetables if they are intended for the fresh market and cannot be adequately washed after harvest to completely remove Surround CF residues. Minor residues of Surround CF on field and garden vegetables for processing are acceptable provided no other pesticides are also present.

### Root and Tuber Vegetables

Such as potato, garden beet, sugar beet, horseradish, radish, ginseng, rutabaga, carrot, ginger, sweet potato, yams, and turnip

PEST	POUNDS SURROUND CF/ACRE	APPLICATION INSTRUCTIONS
Armyworm, Boll worm, Colorado potato beetle, crickets, cutworm, European red mite, flea beetles, grasshoppers, harlequin bug, imported cabbage worm, leafhoppers, tarnished plant bug, tomato horn worm, two-spotted spider mite	25-50	Suppression only.* Start prior to infestation, applying every 7 – 14 days throughout infestation.
Sunburn and heat stress	25-100	See l. d.
*If complete control is needed, consider using supplemental controls.		

### Fruiting Vegetables

Such as tomato, pepper<sup>1</sup> and including eggplant<sup>1</sup>

PEST	POUNDS SURROUND CF/ACRE	APPLICATION INSTRUCTIONS
Aphids, Colorado potato beetle, crickets, cucumber beetles, European red mite, flea beetles, grasshoppers, leafhoppers, lace bugs, stink bugs, Tarnished plant bug, thrips, tomato fruit worm, tomato horn worm, tomato pinworm, two-spotted spider mite	12.5-50 <sup>2</sup>	Suppression only.* Start prior to infestation, applying every 7 – 14 days throughout infestation.
Sunburn and heat stress	25-100	See l. d.
<sup>1</sup> For fresh market apply only up to ¼ of fruit size unless washing capabilities are sufficient. <sup>2</sup> 12.5 pounds/25 gallons preferred up to fruit set *If complete control is needed, consider using supplemental controls.		

### Bulb Vegetables

Such as onions, garlic, leek and shallot

PEST	POUNDS SURROUND CF/ACRE	APPLICATION INSTRUCTIONS
Thrips	25-50	Suppression only.* Start prior to infestation, applying every 5 – 7 days throughout infestation. Good coverage down into the plant crown is essential for efficacy. This can often be assisted with a Tessengerlo Kerley, Inc. approved spreader.
Sunburn and heat stress	25-100	See l. d.
*If complete control is needed, consider using supplemental controls.		



### Cucurbit Vegetables

**Such as cucumber, summer and winter squash, pumpkin, citron melon, muskmelon, and watermelon**

<b>PEST</b>	<b>POUNDS SURROUND CF/ACRE</b>	<b>APPLICATION INSTRUCTIONS</b>
Aphids, crickets, cucumber beetle, grasshoppers, squash vine borer, silver leaf whitefly, squash bugs	25-50	Suppression only.* Start prior to infestation, applying every 5 – 7 days, with the first two applications 3 days apart.
Powdery mildew		Suppression only.* Apply every 7-14 days as required to maintain coverage.
Sunburn and heat stress	25-100	See I. d.
*If complete control is needed, consider using supplemental controls.		

### Brassica (Cole) Leafy Vegetables

**Such as broccolis, Brussels sprouts, Chinese cabbages, cauliflower, collards, cabbages, mustard greens, kale, canola and kohlrabi**

PEST	POUNDS SURROUND CF/ACRE	APPLICATION INSTRUCTIONS
Crickets, flea beetles, grasshoppers, loopers	25-50	Suppression only.* Use only in early season to avoid residue at harvest. Apply every 7 – 10 days making sure to wet the plant surface completely. See Tessengerlo Kerley, Inc. supplementary literature for instructions to aid spreading on waxy brassica surfaces.
Sunburn and heat stress		See l. d.
*If complete control is needed, consider using supplemental controls.		

### Leafy Vegetables (non-Brassica)

**Such as arugula, celery, lettuces, parsley, rhubarb and spinach**

PEST	POUNDS SURROUND CF/ACRE	APPLICATION INSTRUCTIONS
Aphids, armyworm, crickets, cutworms, flea beetles, grasshoppers, leafhoppers, loopers, sea chalcids, thrips, weevils	25-50	Suppression only.* Use only in early season to avoid residue at harvest. Start prior to infestation. Apply every 3 – 5 days to maintain adequate coverage throughout infestation.
Sunburn and heat stress		See l. d.
*If complete control is needed, consider using supplemental controls.		

### Asparagus

PEST	POUNDS SURROUND CF/ACRE	APPLICATION INSTRUCTIONS
Aphids, common and spotted asparagus beetle, crickets, grasshoppers, thrips	12.5-50	Suppression only.* Start prior to infestation. Apply every 7 – 10 days being sure to maintain coverage throughout infestation
Sunburn and heat stress		See l. d.
*If complete control is needed, consider using supplemental controls.		

#### e. Other Agricultural Crops

**Volume:** Apply to near-drip. Do not apply to run-off to avoid waste and poor coverage. The volume of water per acre required will increase throughout the growing season in relationship to the increasing size of the crop and its foliage.

**Concentration** (the amount of Surround CF per 100 gallons of water): It is best to use 25 to 50 pounds Surround CF per 100 gallons of water.

### Cotton

PEST	POUNDS SURROUND CF/ACRE	APPLICATION INSTRUCTIONS
Boll weevil, cotton fleahopper, crickets, European red mite, flea beetles, grasshoppers, tarnished plant bug, thrips, two-spotted spider mite, whitefly	25-50	Suppression only.* Start prior to infestation. Spray every 7 – 14 days with the first two sprays 7 days apart.
Heat stress	25-100	See I. d.
*If complete control is needed, consider using supplemental controls.		

### Tobacco

PEST	POUNDS SURROUND CF/ACRE	APPLICATION INSTRUCTIONS
Aphids, flea beetles, crickets, grasshoppers, leafhoppers, thrips	12.5-25	Suppression only.* Use only in early season up to 12-inch plant size to avoid residue at harvest. Start prior to infestation, applying every 7 – 14 days throughout infestation
Sunburn and heat stress		See l. d.
*If complete control is needed, consider using supplemental controls.		

**Cereal Grains and Nongrass Animal Feeds**  
**Such as corn, popcorn, oats, barley, wheat, rice, sorghum and alfalfa**

<b>PEST</b>	<b>POUNDS SURROUND CF/ACRE</b>	<b>APPLICATION INSTRUCTIONS</b>
Aphids, armyworm, crickets, cutworms, flea beetles, grasshoppers, leafhoppers, loopers, sea chalcids, thrips, weevils	12.5-37.5	Suppression only.* Start prior to infestation. Apply every 5 – 10 days during infestation, with the first two applications 3 days apart. Tighten spray intervals during fast growing periods.
Sunburn and heat stress	25-100	See I. d.

\*If complete control is needed, consider using supplemental controls.

**Tropical Crops**  
**Such as coffee, avocado, banana, guava, mango, passion fruit, starfruit, papaya and pineapple**

<b>PEST</b>	<b>POUNDS SURROUND CF/ACRE</b>	<b>APPLICATION INSTRUCTIONS</b>
Aphids, avocado looper, coconut bug, crickets, fruit flies, grasshoppers, leafhoppers, leafrollers, mango weevil, mites, thrips	25-50	Suppression only.* Start prior to infestation. Apply minimum of 2 applications 7 – 14 days apart during application.
Sunburn and heat stress		See I. d. Aerial application is best for banana.

\*If complete control is needed, consider using supplemental controls.

**Special Directions**

Initial application over waxy surfaces such as mango fruit can bead and not spread adequately.

**Miscellaneous Crops**  
**Such as artichoke, fig, hops, globe, kiwifruit, olives, okra, paw paw, peanut, persimmon, pomegranate, strawberry and water chestnut**

<b>PEST</b>	<b>POUNDS SURROUND CF/ACRE</b>	<b>APPLICATION INSTRUCTIONS</b>
Aphids, crickets, flea beetles, fruit flies, grasshoppers, leafhoppers, leafrollers, olive fruit fly, thrips, white fly	25-50	Suppression only.* Start prior to infestation. Spray every 7 – 14 days throughout infestation.
Sunburn and heat stress		See I. d.

\*If complete control is needed, consider using supplemental controls.



**f. Non-food Crops****Nursery and Ornamental Plants and Trees**

**Such as landscape plants, flowers or ornamental tree seedlings/saplings in nurseries or field plantings and Forest Trees\*\* (deciduous or evergreen) in nurseries or field plantings**

PEST	POUNDS SURROUND CF/ACRE	APPLICATION INSTRUCTIONS
Aphids, black vine weevil, crickets, cutworms, diabrotica beetle, earwig, flathead borer, grasshoppers, leafhoppers including sharpshooters, Japanese beetle, thrips, whitefly	6.25-37.5	Suppression only.* Start prior to infestation. Spray every 5 – 7 days throughout infestation.
Deer, rabbit		Suppression only.* Start prior to animal feeding and maintain coverage during feeding period. For plants on which Surround CF does not adhere well, re-spray as soon as possible following rainfall or protection will be lost.
Sunburn and heat stress		See I d. Reduces transplant shock and heat stress when transplanting nursery stock to the field or garden. Do not dip transplants into Surround CF solution.
*If complete control is needed, consider using supplemental controls. **Sunburn and heat stress only.		

**Special Directions**

Plants treated with Surround CF will appear white from application. If this is undesirable, do not spray. On cut-flower plants, it is best to spray only the leafy foliage of the plant so that cuttings are not affected.

**Christmas Trees and Hybrid Poplar Plantations**

<b>PEST</b>	<b>POUNDS SURROUND CF/ACRE</b>	<b>APPLICATION INSTRUCTIONS</b>
Sunburn and heat stress	25-75	See I. d. Use 25-50 pounds in 100 gallons of water for best results. Spray 2 applications 14 days apart prior to heat event. See Surround CF product bulletins for more information on adjuvants which can aid in product adherence. Stop sprays 30 days prior to harvest.

**g. Greenhouse: including enclosed wall and shade house grown plants**

**Edible and Non-food crops (refer to Section II.f. for a list of Non-food crops)  
Such as all crops listed on this label**

<b>PEST</b>	<b>POUNDS SURROUND CF/ACRE</b>	<b>APPLICATION INSTRUCTIONS</b>
Pests as listed under specific crop groups and non-food crops on this label (refer to sections II.a. – f.)	6.25-37.5	Suppression only.* Start prior to infestation. Spray every 5 – 7 days being sure to maintain coverage, especially on new growth. Exercise extra care to cover undersides of leaves when targeting pests that inhabit leaf undersides.
*If complete control is needed, consider using supplemental controls.		

**h. Animals**

**Cattle and other animals**

PEST	CONCENTRATE POUNDS SURROUND CF/GALLON	SPRAY INTERVAL	APPLICATION INSTRUCTIONS
Flies and stinging insects	0.5-1.0 (50-100 pounds/100 gallons)	Renew coating after it has worn off	Suppression only.* Coat exposed or vulnerable animal body parts by spray or dipping.
Sunburn and heat stress			
*If complete control is needed, consider using supplemental controls.			

**Special Directions**

Do not allow Surround CF to come in contact with the animal's eyes.

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

The directions on this label are believed to be reliable and must be followed carefully. Insufficient control of pests and/or injury to the crop to which the product is applied may result from the occurrence of extraordinary or unusual weather conditions, the failure to follow the label directions, or good application practices, all of which are beyond the control of Tessenderlo Kerley, Inc., or seller. In addition, failure to follow label directions may cause injury to crops, animals, man or the environment. Tessenderlo Kerley, Inc. warrants that this product conforms to the chemical description on the label and is reasonably fit for the purpose referred to in the directions for use, subject to the factors noted above which are beyond the control of Tessenderlo Kerley, Inc. Except as warranted by this label, Tessenderlo Kerley, Inc. makes no other warranties or representations of any kind, express or implied, concerning the product, including no implied warranty of merchantability or fitness for any particular purpose. To the extent consistent with applicable law, the exclusive remedy against Tessenderlo Kerley, Inc. for any cause of action relating to the handling or use of this product is a claim of damage, and in no event shall damages or any other recovery of any kind against Tessenderlo Kerley, Inc. exceed the price of the product which causes the alleged loss, damage, injury, or other claim. To the extent consistent with applicable law, Tessenderlo Kerley, Inc. shall not be liable and any and all claims against Tessenderlo Kerley, Inc. are waived, 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 Tessenderlo Kerley, Inc. breach of warranty, strict liability in tort, or any other cause of action. Tessenderlo Kerley, Inc. and the seller offer this 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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