



A preemergence surface-applied herbicide for the control of many annual grasses and certain broadleaf weeds in citrus, fruit and nut trees, berries, vineyards, Christmas tree plantations and established trees grown for pulp.

ACTIVE INGREDIENT:	BY WT.
Oryzalin: 3,5-dinitro- <i>N</i> ⁴ , <i>N</i> ⁴ -dipropylsulfanilamide	40.4%
OTHER INGREDIENTS:	59.6%
TOTAL:	100.0%

Contains 4 pounds of active ingredient per gallon.

EPA Reg. No. 70506-43

**KEEP OUT OF REACH OF CHILDREN
CAUTION**

FIRST AID

If in eyes:	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
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Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact the Rocky Mountain Poison Control Center at 1-866-673-6671 for emergency medical treatment.

FOR CHEMICAL EMERGENCY: Spill, leak, fire, exposure, or accident, call CHEMTREC at 1-800-424-9300.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

Shake Well Before Using.



NET CONTENTS: _____ GALLONS



PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

CAUTION

Causes moderate eye irritation. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Avoid contact with eyes or clothing.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves
- Shoes plus socks
- Mixers and loaders must wear a chemical-resistant apron in addition to other PPE.

Discard clothing/PPE and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

ENGINEERING CONTROLS STATEMENTS

When handlers use closed systems or enclosed cabs in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d) (4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish. Do not apply directly to water, 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 washwaters. Cover or incorporate spills.

DIRECTIONS FOR USE

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

Read all Directions for Use carefully before applying.

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. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

AGRICULTURAL USE REQUIREMENTS

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, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 24 hours. **Exception:** If the product is soil-injected or soil incorporated, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.

Workers may enter treated areas without required PPE during the reentry interval following 1/2 to 1 inch of rainfall or irrigation, if they are performing tasks that do not involve contact with the soil subsurface; otherwise, PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Chemical-resistant gloves
- Shoes plus socks

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

Pesticide Storage: Store in original container only. In case of leak or spill, use absorbent materials to contain liquids and dispose as waste.

Pesticide Disposal: Wastes resulting from use of this product may be disposed of on site or at an approved waste disposal facility.

Container Disposal: Nonrefillable container. Do not reuse or refill this container. Clean container promptly after emptying.

[for containers less than or equal to 5 gallons] Triple rinse as follows: empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

[for containers greater than 5 gallons] Triple rinse or pressure rinse as follows: Triple rinse: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Turn the container over on its end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times.

Pressure rinse: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after flow begins to drip.

[all sizes] Offer for recycling if available, or puncture and dispose of in a sanitary landfill or by incineration, or if allowed by state and local authorities, by burning. If burned, stay out of smoke.

GENERAL INFORMATION

SURFLAN A.S. herbicide is a preemergence, surface applied herbicide for the control of many annual grasses and certain broadleaf weeds. SURFLAN A.S. controls susceptible annual weeds by disrupting plant growth processes during germination. SURFLAN A.S. may be applied in liquid sprays of water or liquid fertilizer, and may be tank mixed with other herbicides to control existing vegetation or improve the spectrum of weeds controlled. SURFLAN A.S. alone does not control established weeds.

Crop uses: citrus fruits, fruit and nut trees, berries, vineyards (bearing and non-bearing).

Other uses: Christmas tree plantations, established trees grown for pulp, noncropland areas and industrial sites.

SURFLAN A.S. is orange in color and may cause temporary discoloration of sprayed surfaces. If this discoloration is undesirable, it may be altered by using a commercially available colorant such as Blazon or removed by spraying surface with water or washing with an industrial cleaner immediately after application. SURFLAN A.S. may also be applied with colorants, such as Mulch Magic or Nu-Mulch.

SURFLAN A.S. may be applied before or after transplanting of the crop. If applied prior to transplanting: (1) disturbance of surface soil should be minimized to prevent loss of weed control; and (2) exposure of the roots of transplants to treated soil should be minimized to avoid any possibility of crop injury.

GENERAL USE PRECAUTIONS AND RESTRICTIONS

- Do not graze or feed forage from treated areas to livestock.
- Poor weed control may result if directions are not carefully followed.
- Do not over-apply SURFLAN A.S. Over-application may result in crop injury.
- Do not plant any root crop for 12 months following a SURFLAN A.S. application.
- Do not use SURFLAN A.S. on soils containing more than 5% organic matter.
- Apply SURFLAN A.S. directly to the soil surface in orchards or vineyards.
- For orchard crops, including citrus, pome fruits, stone fruits, and tree nuts, apply product only as a strip treatment in the tree rows; do not apply to row middles or drive rows.
- Carefully follow label directions to avoid poor weed control or crop injury.
- **Chemigation:** See instructions for chemigation in "Application Methods".
- Do not aerially apply this product.

Precaution: Avoid spray drift to non-target areas when applying SURFLAN A.S. Spray drift may result in reduced emergence of non-target plants adjacent to the treated area. Poor weed control may result if directions are not followed. Over-application may result in crop injury and in residues that exceed tolerance regulations, or in excessive soil residue that may be injurious to rotational crops. **Rotation Crop Interval:** To avoid crop injury, a 24 month rotational interval is recommended when rotating from tree and vine crops to row crops.

WEEDS AND GRASSES CONTROLLED

Annual Grasses

Common Name

barley, little
barnyardgrass (watergrass)
bluegrass, annual (poa)
brachiaria (signalgrass)
crabgrass
(large crabgrass)
(smooth crabgrass)
crowfootgrass
cupgrass

Scientific Name

Hordeum pusillum
Echinochloa crus-galli
Poa annua
Brachiaria spp.
Digitaria spp.

Dactyloctenium aegyptium
Eriochloa gracilis

Annual Grasses (continued)

Common Name

downy brome
foxtails
(bottlegrass)
(bristlegrass)
(giant foxtail)
(green foxtail)
(pigeongrass)
(robust foxtail)
(yellow foxtail)
guineagrass
(narrowleaf panicum)
Goosegrass (silver crabgrass)
johnsongrass (seedling only)
junglerice
lovegrass, Mexican
lovegrass, orcutt
oat, wild
panicum, browntop
panicum, fall
(spreading panicgrass)
panicum, Texas
(buffalograss)
(Coloradograss)
ryegrass, annual (Italian)
sandbur, field
sprangletop, red
witchgrass

Annual Broadleaf Weeds

Common Name

bittercress
carpet weed
chickweed, common
cudweed
fiddleneck, coast
filaree, redstem
filaree, whitestem
Florida pusley
(Florida purslane)
(Mexican clover)
(pusley)
groundsel, common
henbit
knotweed, prostrate
lambquarters
pigweeds
(carelessweed)
(prostrate pigweed)
(redroot pigweed)
(rough pigweed)
(smooth pigweed)
(spiny pigweed)
(spring pigweed)
(tumble pigweed)
puncturevine
purslane, common
rocket, London
rockpurslane, desert
rockpurslane, redmaids
shepherdspurse
spurge, prostrate
woodsorrel, yellow

Scientific Name

Bromus tectorum
Setaria spp.

Panicum maximum

Eleusine indica
Sorghum halepense
Echinochloa colinum
Eragrostis mexicana
Eragrostis orcuttiana
Avena fatua
Panicum fasciculatum
Panicum dichotomiflorum

Panicum texanum

Lolium multiflorum
Cenchrus incertus
Leptochloa filiformis
Panicum capillare

Scientific Name

Cardamine oligosperma
Mollugo verticillata
Stellaria media
Gnaphalium chilense
Amsinckia intermedia
Erodium cicutarium
Erodium moschatum
Richardia scabra

Senecio vulgaris
Lamium amplexicaule
Polygonum aviculare
Chenopodium album
Amaranthus spp.

Tribulus terrestris
Portulaca oleracea
Sisymbrium irio
Calandrinia ciliata
Calandrinia caulescens
Capsella bursa-pastoris
Euphorbia humistrata
Oxalis stricta

WEEDS AND GRASSES CONTROLLED (continued)

SURFLAN A.S. provides partial control or suppression of:

Common Name	Scientific Name
groundsel, common	<i>Senecio vulgaris</i>
horseweed	<i>Conyza canadensis</i>
ladysthumb	<i>Polygonum persicaria</i>
lettuce, prickly	<i>Lactuca serriola</i>
mallow, common	<i>Malva neglecta</i>
milkweed, climbing	<i>Sarcostemma cynanchoides</i>
morningglory, annual	<i>Ipomoea</i> spp.
mustard, black	<i>Brassica nigra</i>
mustard, wild	<i>Sinapis arvensis</i>
nightshade, black	<i>Solanum nigrum</i>
prickly sida (teaweed)	<i>Sida spinosa</i>
ragweed, common	<i>Ambrosia artemisiifolia</i>
ragweed, giant	<i>Ambrosia trifida</i>
smartweed, annual	<i>Polygonum</i> spp.
sowthistle, annual	<i>Sonchus oleraceus</i>
spurge, spotted	<i>Euphorbia maculata</i>
teaweed (prickly sida)	<i>Sida spinosa</i>
velvetleaf	<i>Abutilon theophrasti</i>
wheat, volunteer	<i>Triticum</i> spp.

CROP-SPECIFIC USE DIRECTIONS

Tree and Vine Crops - Citrus, Fruit and Nut Trees, Berries and Vineyards (Non-Bearing and Bearing)

Apply SURFLAN A.S. as a preemergence treatment to control annual grasses and broadleaf weeds listed in "General Information" section. Observe all precautions and restrictions in the "General Information" section.

Crop Listing: SURFLAN A.S. may be applied to crops listed under the following crop groupings:

Citrus Fruits	Pome and Stone Fruits	Tree Nuts	Berries	Vineyards
citrus	apple	almond	blackberry	grapes
citron	apricot	chestnut	blueberry†	
citrus hybrids	cherry	chinquapin	boysenberry	
grapefruit	crabapple	filbert	currant	
kumquat	loquat	hickory nut	dewberry	
lime	mayhaw	macadamia nut	elderberry	
lemon	nectarine	pecan	gooseberry	
mandarin (tangerine)	peach	pistachio	loganberry	
orange	pear	walnut	raspberry	
pummelo	plum			
	prune			
	quince			

†Do not apply SURFLAN A.S. to lowbush blueberries.

In addition to the crops within crop groupings listed above, SURFLAN A.S. may be used in the following crops: avocado, fig, guava, kiwi fruit, olive, papaya, and pomegranate.

SOIL PREPARATION

SURFLAN A.S. controls weeds growing from seed. SURFLAN A.S. will not control emerged weeds. SURFLAN A.S. does not control established weeds, weeds growing from stolons, rhizomes, or root pieces. Therefore, areas to be treated should be free of emerged weeds. Weed residues, prunings, and trash should be thoroughly mixed into the soil or removed prior to treatment. In field applications, the soil should be in good till and free of clods at the time of application.

Broadcast Application Rates

Soil Texture	Length of Control	SURFLAN A.S. (qt/acre)	Minimum Time Between Applications (months)	Total Amount Allowed Per Year (qt/acre)
All Soil Textures	Short Term (2 - 4 months)	2	2.5	12
	Long Term (6 - 8 months)	4	2.5	12
	(8 - 12 months)	6	2.5	12

ACTIVATION AND CULTIVATION

A single 1/2 to 1 inch rainfall or sprinkler irrigation is required to activate SURFLAN A.S. and move the herbicide into the zone of weed germination. Rainfall or irrigation of 1 inch or more is needed to activate SURFLAN A.S. on fine-textured, high organic matter soils. If weeds begin to emerge, a shallow cultivation to a depth of 1 to 2 inches will destroy existing weeds and place SURFLAN A.S. in the zone of weed germination.

MIXING DIRECTIONS

SURFLAN A.S. - Alone

SURFLAN A.S. may be applied in water or most liquid fertilizer materials. Prior to mixing SURFLAN A.S. in liquid fertilizer, refer to "Testing for Compatibility in Liquid Fertilizers" for test procedures to determine compatibility with the fertilizer product to be used. The combination of SURFLAN A.S. with solution and suspension-type fertilizers provides annual weed control equal to SURFLAN A.S. applied in water. Individual state regulations relating to liquid fertilizer mixing, registration, labeling and application are the responsibility of the individual and/or company offering the fertilizer and chemical mixture for sale.

Start with a clean spray tank. Fill the sprayer to 1/3 to 1/2 of the required spray volume. Start agitation. Shake the container well and add the correct amount of SURFLAN A.S., continue agitation and fill spray tank to required spray volume. Maintain continuous agitation from mixing through application.

Precaution: Do not allow the mixture to siphon back into the water source.

SURFLAN A.S. in Tank Mix

Vigorous, continuous agitation during mixing, filling and throughout application is required for all tank mixes. Sparger pipe agitators generally provide the most effective agitation in spray tanks. To prevent foaming in the spray tank, avoid stirring or splashing air into the spray mixture.

SURFLAN A.S. may be tank mixed with label rates of other products and applied with water or most liquid fertilizer materials, provided (1) the tank mix product is labeled for the timing and method of application for the use site to be treated; (2) tank mixing is not prohibited by the label of the tank mix product; and (3) A (jar) test is performed to ensure the compatibility of products to be used in tank mixture.

SURFLAN A.S. Tank Mix Recommendations:

To broaden the spectrum of weed control, SURFLAN A.S. may be applied in tank mix combination with labeled rates of other herbicide products, including, but not limited to Goal, Gramoxone, Princep (Simazine), glyphosate, or Solicam herbicide. Performance and risk of carryover from tank mixed products used in combination with SURFLAN A.S. at recommended rates is the same as when each product is used separately.

Tank Mixing Precautions:

- Read carefully and follow all applicable use directions, precautions, and limitations on the respective product labels.
- Do not exceed recommended application rates.
- For products packaged in water soluble packaging, do not tank mix with products containing boron or mix in equipment previously used to apply a product mixture containing boron unless the tank and spray equipment has been thoroughly cleaned.

Tank Mix Compatibility Testing: A jar test is recommended prior to tank mixing to ensure compatibility of SURFLAN A.S. and other products. Use a clear glass quart jar with lid and mix the tank mix ingredients in their relative proportions. Invert the jar containing the mixture several times and observe the mixture for approximately 1/2 hour. If the mixture balls-up, forms flakes, sludges, gels, oily films or layers, or other precipitates, it is not compatible and the tank mix combination should not be used.

Mixing Order (Tank Mixing with Water): Fill the spray tank to 1/4 to 1/3 of the total spray volume. Start agitation. Add different formulation types in the following order, allowing time for complete mixing and dispersion after addition of each product (allow extra mixing and dispersion time for dry flowable products):

1. Add dry flowables; wettable powders; SURFLAN A.S. or other aqueous suspensions, flowables and water-based solutions.
2. Maintain agitation and fill spray tank to 3/4 of total spray volume. Then add any emulsifiable concentrates.

Finish filling the spray tank. Maintain continuous agitation during mixing, final filling and throughout application. If spraying and agitation must be stopped before the spray tank is empty, the materials may settle to the bottom. Settled materials must be resuspended before spraying is resumed. A sparger agitator is particularly useful for this purpose. Settled material may be more difficult to resuspend than when originally mixed.

Tank Mixing with Liquid Fertilizer: Prior to mixing SURFLAN A.S. with other products in liquid fertilizer, refer to the tank mix product manufacturer's label to determine if application in liquid fertilizer is recommended. Also refer to "Testing for Compatibility in Liquid Fertilizers" for testing procedures to determine tank mix compatibility with the liquid fertilizer product to be used. The combination of SURFLAN A.S. with solution and suspension-type fertilizers provides annual weed control equal to SURFLAN A.S. applied in water. Individual state regulations relating to liquid fertilizer mixing, registration, labeling and application are the responsibility of the individual and/or company offering the fertilizer and chemical mixture for sale. Read and follow all label instructions for each material to be added to the spray tank.

Vigorous continuous agitation is required for all tank mixes. Sparger pipe agitators generally provide the best agitation in spray tank. To prevent foaming, keep the end of the fill pipe below the surface of the water in the spray tank during filling to prevent air from being stirred or splashed into the mixture.

Mixing Order (Tank Mixing With Liquid Fertilizer): Fill the spray tank to 3/4 of the total spray volume required. Start agitation. Add different formulation types in the following order, allowing time for complete mixing and dispersion after addition of each product. (Allow extra mixing and dispersion time for dry flowable products):

Dry flowables; wettable powders; SURFLAN A.S. or other aqueous suspensions, flowables, water-based solutions, and any emulsifiable concentrates.

Finish filling spray tank. Maintain continuous agitation during mixing, final filling and throughout application. If spraying and agitation must be stopped before the spray tank is empty, the materials may settle to the bottom. Settled materials must be suspended before spraying is resumed. A sparger agitator is particularly useful for this purpose. Settled materials may be more difficult to resuspend than when originally mixed.

Premixing: When tank mixing, initial mixing and dispersion of certain dry flowable or wettable powder products may be improved by premixing with water (slurrying). Where recommended, follow product label instructions for each material. Adding the slurried material to the spray tank through a 20 to 35 mesh wetting screen will help assure good initial dispersion. Line screens in the tank through a 20 to 35 mesh wetting screen will help assure good initial dispersion. Line screens in the tank should be no finer than 50 mesh (100 mesh is finer than 50 mesh).

TESTING FOR COMPATIBILITY IN LIQUID FERTILIZERS

SURFLAN A.S. alone or in combination with dry flowable (DF), wettable powder (WP), aqueous suspension (AS), flowable (F), liquid (L), solution (S) or emulsifiable concentrate (EC) formulations may not combine properly with some liquid fertilizer materials. Small quantities of such mixtures should **always** be tested before full-scale mixing. Follow the testing procedure below to determine if a compatibility agent is needed or which compatibility agent works best in your liquid fertilizer plus herbicide mixture.

Testing Procedure

1. Add 1 pint of liquid fertilizer to 1-quart glass jar.
2. Add 1 to 4 teaspoonfuls of DF, WP, SURFLAN A.S., other AS formulations, F, or L formulations, depending on mixing ratio required, to the liquid fertilizer. Close the jar and shake until evenly dispersed after addition of each formulation. If dry flowable or wettable powder formulations do not disperse well, it may be necessary to slurry the materials in a small amount of water before addition to the liquid fertilizer.
3. After dispersing the materials in step 2, add any S formulations to the jar and shake well. Finally, add EC formulations to the mixture and shake well. Observe the jar for about 10 minutes. If materials rise to the surface and form a thick layer that will not redispense when agitated, a compatibility agent is needed. If the mixture is easily redispersed with slight agitation, a compatibility agent is not required. Good agitation, however, must be provided to maintain dispersion in the spray tank from mixing through application.
4. If the need for a compatibility agent is demonstrated in step 3, the following procedure is recommended: Using a clean clear plastic or glass container, repeat step 1 above and add 1/2 teaspoon of the compatibility agent to the liquid fertilizer mixture. Shake well and then repeat steps 2 and 3.

An effective compatibility agent will cause the mixture to remain uniformly mixed with little or no separation for 1/2 hour or longer. If slight separation occurs, 2 to 3 inversions of container should be sufficient to uniformly redispense the mixture. If layers form which will not disperse, try adding additional compatibility agent or use an alternative compatibility agent to achieve a uniform mixture.

Use a clean jar in each test. A compatible mixture will have a uniform appearance and will be relatively easy to redispense with gentle agitation of the jar.

Compatibility Agents

Use a phosphate ester-type surfactant designed for use with liquid fertilizers mixed at rates as low as 1 1/2 to 2 pints per ton of liquid fertilizer. This type of surfactant usually doesn't work well as compatibility agent for tank mixes in plain water. Add the compatibility agent just before adding herbicides. Read and follow label directions for the compatibility agent.

APPLICATION METHODS

Ground Broadcast Application

Apply SURFLAN A.S. directly to the soil surface of the orchard or vineyard in a total spray volume of 20 to 40 gallons per acre (broadcast basis), using any properly calibrated low pressure herbicide sprayer that will apply the spray uniformly. Use herbicide nozzle tips and screens no finer than 50 mesh for nozzle and in-line strainers. As the amount of spray volume per acre decreases, the importance of accurate calibration and uniform application increases. Check the sprayer daily to insure proper calibration and uniform application. Avoid boom overlaps that will increase rates above those recommended.

Band Application

For band application, use the following formula to calculate the required amount of product per acre.

$$\frac{\text{Band Width (inches)}}{\text{Row Width (inches)}} \times \text{Broadcast rate per acre} = \text{Amount required per acre}$$

Chemigation

SURFLAN A.S. may be applied through properly equipped chemigation systems for weed control in fruit and nut orchards or vineyards. Read and follow all label instructions outlined below concerning chemigation before applying SURFLAN A.S. by this method. Apply SURFLAN A.S. by chemigation prior to weed germination or immediately after existing weeds have been controlled. Control existing unwanted vegetation by tillage or with a contact or translocated herbicide. Use broadcast application rates recommended for SURFLAN A.S. alone. Apply in sprinkler irrigation equal to 1/2 to 1 inch of water on medium to fine textured or high organic matter soils.

Chemigation Use Precautions: Apply this product only through solid set or hand move systems designed to distribute sprinkler irrigation beneath the tree canopy. Solid set systems utilizing tall risers for overhead application are excluded, except for dormant season applications of SURFLAN A.S. Do not apply this product through any type of irrigation system not indicated on this label.

Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from nonuniform distribution of treated water.

If you have questions about calibration you should contact state extension specialists, equipment manufacturers or other experts.

Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system.

A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.

Sprinkler Chemigation Directions: The following directions must be followed for all recommended sprinkler irrigation systems (solid set and hand move systems):

1. The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from back-flow.
2. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
3. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
4. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.

5. The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point that pesticide distribution is adversely affected.
6. Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
7. Do not apply when wind speed favors drift beyond the area intended for treatment.
8. SURFLAN A.S. should be injected continuously throughout the chemigation period. The chemigation metering pump should be checked periodically during application to insure proper operation.
9. The injection metering pump must be calibrated as specified by the manufacturer.
10. During chemigation, maintain agitation in supply tank at all times.
11. SURFLAN A.S. may cause some staining of plastic hoses and tanks.
12. Apply SURFLAN A.S. in sprinkler irrigation equal to 1/2 to 1 inch of water.

Chemigation System Calibration: Sample calculation for use of SURFLAN A.S. in a chemigation system:

- Assume, in this example, 35 acres are to be covered by a chemigation treatment.
- Product required, assuming 1 quart per acre is 35 quarts (8.75 gallons).
- Prepare a mixture containing 1 part water and 1 part SURFLAN A.S. by adding 8.75 gallons of product to the supply tank containing an equal amount of water (total volume = 17.5 gallons).
- Adjust the injection system to deliver 17.5 gallons during the time required to apply 1 inch of water to 35 acres.
- If the irrigation system requires 5 hours to apply 1 inch of water to 35 acres, the injection rate is 3.5 gallons per hour and is calculated as follows:

$$17.5 \text{ gallons} / 5 \text{ hours} = 3.5 \text{ gallons/hour} \\ [3.5 \text{ gallons} = 448 \text{ fluid ounces (fl oz)}]$$

Proper calibration requires the injection pump to be adjusted to deliver 7.47 fl oz per minute and is calculated as follows:

$$448 \text{ fl oz per hr} / 60 \text{ min per hr} = 7.47 \text{ fl oz/min.}$$

Chemigation Mixing Directions: The injection mixture (slurry) with minimum volume may be prepared by adding the required amount of SURFLAN A.S. to an equal amount of water in the injection tank (ratio SURFLAN A.S. to water = 1:1). Meter the mixture into the irrigation system during the entire irrigation period. Additional dilution of SURFLAN A.S. may be necessary for accurate calibration of equipment designed to deliver a larger injection volume per hour. Maintain supply tank agitation throughout the irrigation period.

Undiluted SURFLAN A.S. should not be injected into chemigation systems.

Chemigation Instructions (for low-volume micro sprinklers)

Output of low-volume sprinkler equals 4 to 50 gallons per hour (GPA) per emitter. Point of application **MUST** be above ground. Irrigation system should run a sufficient amount of time prior to SURFLAN A.S. injection to have all emitters functioning properly. After system is operating properly, length of injection should be such that at one period of time during the injection, the first and last emitters in the system contain SURFLAN A.S.-treated water. Add SURFLAN A.S. to the supply tank already filled with the volume of water required for the injection period. Maintain proper agitation in SURFLAN A.S. injection tank. Mix SURFLAN A.S. in clean water and inject down-line from filters. Following SURFLAN A.S. injection, flush system for a period of time sufficient to clear the line of SURFLAN A.S. (If SURFLAN A.S. is applied during a normal irrigation cycle, make injection during the last stage.)

Chemigation Calibration (for low-volume micro sprinklers)

Calculation of use rate is based on wetted area around emitters - **NOT** on tree acres. To determine correct amount of SURFLAN A.S., use the following formula:

1. Treated area per each emitter = A
 $A = 3.14 \times (\text{radius} \times \text{radius})$
2. The area in square feet wet in each acre = B
 $B = \frac{A \times \text{emitters/acre}}{144}$
3. The total area (in square feet) wet by your system = C
 $C = B \times \text{acres covered by system}$
4. Rate per treated acre of SURFLAN A.S. (based on length of control desired) = R

Example:

If the average distance from emitter to perimeter of wetted area measured 1 inch below soil surface is 13 inches, then

$$A = 3.14 \times (13 \text{ inches} \times 13 \text{ inches})$$

and $A = 530.7$ square inches

If there are 300 emitters per acre, then

$$\frac{530.7 \times 300}{144} \text{ and } B = 1105.6 \text{ square feet wetted per acre}$$

If the system covers 20 acres, then

$$C = 1105.6 \text{ square feet per acre} \times 20 \text{ acres}$$

and $C = 22,112$ square feet wetted by system

If the desired application rate per treated acre is 2.0 qts of SURFLAN A.S., then

$$S = \frac{22,112}{43,560} \times 2.0 \text{ and } S = 1.0 \text{ qt} = \text{amount of SURFLAN A.S. to inject into the system.}$$

Non-Bearing Tree and Vine Crops: For additional broad spectrum control of broadleaf weeds in non-bearing fruit and nut trees, berries, and vineyards, SURFLAN A.S. may be applied in tank mix combination with labeled rates of Gallery 75 Dry Flowable herbicide. Non-bearing crops are defined as plants that will not bear fruit for at least one year after treatment.

Follow tank mixing instructions in the "Mixing Directions" section of this label when mixing SURFLAN A.S. with other products.

Applicators must follow the label for the product(s) to be tank mixed with SURFLAN A.S. for specific information on use rates, additional weeds controlled, rotational crop restrictions or risk of carryover, special tank mix instructions, additional use directions, precautions and limitations.

OTHER USES

Apply SURFLAN A.S. as a preemergence treatment to control annual grasses and broadleaf weeds listed in "General Information" section. Observe all precautions and restrictions in the "General Information" section.

Christmas Tree Plantations

SURFLAN A.S. - Alone

Apply SURFLAN A.S. as a directed spray to the soil surface or as an overtop spray to established plantings of field grown Christmas tree species, including fir (*Abies* spp.), pine (*Pinus* spp.), and spruce (*Picea* spp.). Follow all instructions provided in the "General Information" section of this label.

Broadcast Application Rates

Length of Control	SURFLAN A.S.		Minimum Time Between Applications (months)	Total Amount Allowed Per Year (qt/acre)
	(qt/acre)	(fl oz/1000 sq ft)		
2 - 4 months	2	1.5	2	8
4 - 8 months	4	3	2	8

Tank Mix Combinations

Tank mix combinations of SURFLAN A.S. plus other labeled herbicides may be used as directed or overtop sprays in established Christmas tree plantings. When applied according to use directions, these tank mixes will provide control of susceptible weed species listed on the respective product labels. Refer to label of the product to be tank mixed with SURFLAN A.S. for specific use directions, precautions and limitations before use.

SURFLAN A.S. herbicide Plus Glyphosate Herbicide: Apply tank mix combinations of SURFLAN A.S. plus glyphosate herbicide only as directed sprays in Christmas tree plantings. When applied according to use directions, SURFLAN A.S. plus glyphosate herbicide will provide postemergence control of susceptible weed species listed on the label for glyphosate herbicide and residual preemergence control of susceptible weed species listed on the label for SURFLAN A.S. Refer to the label for glyphosate herbicide for specific use directions, precautions and limitations before use.

Precautions:

- Do not apply to Douglas-fir (*Pseudotsuga menziesii*).
- Do not apply to seedbeds or seedling transplant beds.
- Apply only to established plantings. Established plantings are defined as those that have been transplanted into their final growing location for a sufficient period of time to allow the soil to be firmly settled around the roots from packing and rainfall or irrigation.
- Do not apply sprays containing glyphosate herbicide over the top of Christmas tree plantings.
- Extreme care must be exercised to avoid contact of spray containing glyphosate herbicide with foliage and stems of Christmas trees or severe damage or death may result.

Established Trees Grown for Pulp

SURFLAN A.S. herbicide may be applied as a preemergence treatment in plantations of established[†] trees grown for pulp. Applications may be made prior to the expected time of weed germination or immediately after tillage or herbicide treatments to destroy existing weeds. Refer to the “General Information” section for a listing of grasses and broadleaf weeds controlled, mixing directions and General Use Precautions. Optimum herbicidal activity occurs when SURFLAN A.S. is applied directly to the soil surface following tillage or applications of contact or translocated herbicides to destroy existing weeds, and weed residues, prunings and trash are removed or thoroughly mixed into the soil using tillage equipment.

[†]Established plantings are defined as trees that have been transplanted into their final growing location for a sufficient period of time to allow the soil to be firmly settled around the roots as a result of rainfall or irrigation.

Activation and Cultivation: A single 1/2 to 1 inch rainfall or sprinkler irrigation is required to activate SURFLAN A.S. and move the herbicide into the zone of weed germination. Rainfall or irrigation of 1 inch or more is needed to activate SURFLAN A.S. on fine-textured, high organic matter soils. If weeds begin to emerge, shallow cultivation to a depth of 1 to 2 inches will destroy existing weeds and place SURFLAN A.S. in the zone of weed germination.

Broadcast Application Rates

Soil Texture	Length of Control	SURFLAN A.S. (qt/acre)	Minimum Time Between Applications (months)	Total Amount Allowed Per Year (qt/acre)
All Soil Textures	Short Term (2 - 4 months)	2	2.5	12
	Long Term (6 - 8 months)	4	2.5	12
	(8 - 12 months)	6	2.5	12

Chemigation

SURFLAN A.S. may be applied through properly equipped chemigation systems for weed control in tree plantations grown for pulp. Refer to “Chemigation” in “General Information” for use directions. Do not apply SURFLAN A.S. by chemigation unless these use directions are carefully followed.

Apply SURFLAN A.S. by chemigation prior to weed germination or immediately after existing weeds have been controlled. Control existing unwanted vegetation by tillage or with a contact or translocated herbicide. Use broadcast application rates recommended for SURFLAN A.S. alone. Apply in sprinkler irrigation equal to 1/2 to 1 inch of water on medium to fine textured or high organic matter soils.

Chemigation Use Precautions: Apply this product only through solid set or hand move systems designed to distribute sprinkler irrigation beneath the tree canopy. Solid set systems utilizing tall risers for overhead application are excluded, except for dormant season applications of SURFLAN A.S. Do not apply this product through any other type of irrigation system.

Tank Mix Recommendations

To broaden the spectrum of weed control, SURFLAN A.S. may be applied in tank mix combination with labeled rates of other herbicide products, provided such products are labeled for use. Performance and risk of carry-over from tank mixed products used in combination with SURFLAN A.S. at recommended rates is the same as when each product is used separately.

IMPORTANT INFORMATION READ BEFORE USING PRODUCT

CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

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