

PM 23

62719-113

09/22/99

1/34



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

SEP 22 1999

OFFICE OF  
PREVENTION, PESTICIDES AND  
TOXIC SUBSTANCES

Ms. Arlene W. Hamburg, Ph.D.  
Dow AgroScience LLC  
9330 Zionsville Road  
Indianapolis, IN 46268

Dear Dr. Hamburg:

SUBJECT: 8-Month Response to the Oryzalin RED  
Surflan A.S.  
EPA Registration No. 62719-113  
Your Resubmission (Revised Labeling) Dated March 3, 1999

The revised labeling for the subject product, referred to above, submitted in connection with registration under the Federal Insecticide, fungicide and Rodenticide Act, as amended, is acceptable with the following changes:

1. Under "Engineering Controls Statements" remove the word "aircraft" since there is an aerial application prohibition.
2. In third paragraph under "Agricultural Use Requirements" insert the following statement after the word irrigation "if they are performing tasks that do not involve contact with the soil subsurface", .....

San. Cook  
9-22-99

A stamped copy of the labeling is enclosed for your records. Please submit one copy of your final printed labeling before you release the product for shipment.

EPA has determined that you have fulfilled the labeling and product specific data requirements of the oryzaline RED. However, we cannot reregister this product at this time for the following reason:

The subject project is registered for use on turfgrass, a use for which the Agency does not have sufficient information to make a reregistration eligibility decision. Once the required data (foliar dislodgeable residues/guideline 132-1a; soil dislodgeable residues/guideline 132-1b; estimation of dermal exposure/guideline 133-3; and estimation of inhalation exposure/guideline 133-4) have been reviewed by the Agency, EPA will make a reregistration eligibility decision for the turfgrass use.

The Agency has recently revised its recommended First Aid statements for pesticide products and intends to issue a PR Notice announcing the changes in the near future. In the interim we are encouraging registrants to begin using the new statements. The new statements were developed as part of the Consumer Labeling Initiative in close cooperation with poison control center personnel and other medical experts. While it is not mandatory that you revise your label at this time, you are strongly encouraged to substitute the revised statements for those statements currently on the label as your next label printing:

## FIRST AID

If swallowed:	<ul style="list-style-type: none"> <li>• Call a poison control center or doctor immediately for treatment advice.</li> <li>• Have person sip a glass of water if able to swallow.</li> <li>• Do not induce vomiting unless told to by a poison control center or doctor.</li> </ul>
If in eyes:	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
If on skin:	<ul style="list-style-type: none"> <li>• Take off contaminated clothing.</li> <li>• Rinse skin immediately with plenty of water for 15-20 minutes.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
If inhaled:	<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>

Have the product container or label with you when calling a poison control center or doctor or going for treatment.

Sincerely yours,

Joanne I. Miller  
Product Manager (23)  
Herbicide Branch  
Registration Division (7505C)

Enclosures

# Surflan\* A.S.

EPA Reg. No. 62719-113

## Registration Notes:

Current label text based on EPA-accepted copy dated 05/17/95.

The following changes are being submitted in Response to EPA correspondence dated January 13, 1999. The label for this product has been amended in accordance with the Federal Register Notice dated 11/06/98 for oryzalin and the Oryzalin RED dated 01/27/95.

### Acute toxicity information for Surflan A.S.:

Route of Exposure	Acute Toxicity Category by Route of Exposure	
	Technical Oryzalin	Surflan A.S.
Oral LD50	IV	IV
Dermal LD50	IV	IV
Dermal Irritation	IV	IV
Ocular Irritation	IV	III
Inhalation	IV	IV
Dermal Sensitization	neg	pos

### Changes by Amendment Per RED Requirements:

- 1. Precautionary Statements:** (1) revised format of KOROC statement, signal word and Spanish advisory on base label per recent guidance from EPA labeling team; (2) revised statement of hazard and precautionary measures text in accordance with acute toxicity data; (3) revised PPE for applicators and other handlers; (4) revised User Safety statements; (5) added Engineering Controls statements; and (6) added "toxic to fish" statement to Environmental Hazards section.
- 2. Directions for Use:** (1) added language allowing workers to enter treated areas without required PPE during the reentry interval following 1/2 to 1 inch of rainfall or irrigation; (2) added "Non-Agricultural Use Requirements" box; (3) added prohibition against aerial application; (4) added restriction on grazing or feeding forage from treated areas; and (5) added application rate limitations (rate range, minimum time between applications, and total allowable use rate per year).

[Editor's note: Added text is underlined and deleted text is denoted by strike-through.]

\*Trademark of Dow AgroSciences LLC

ACCEPTED  
with COMMENTS  
In EPA Letter Dated

SEP 22 1999

Under the Federal Insecticide,  
Fungicide, and Rodenticide Act  
as amended, for the pesticide  
registered under EPA Reg. No.  
62719-113

(Base label):

(Logo) Dow AgroSciences LLC

# Surflan\* A.S.

A selective preemergence surface-applied herbicide for control of annual grasses and many broadleaf weeds in:

- o Landscape Ornamentals
- o Container Grown Ornamentals
- o Field Grown Ornamentals
- o Drainage Areas Under Shadehouse Benches
- o Ornamental Bulbs
- o Ground Covers/Perennials
- o Christmas Tree Plantations
- o Noncropland and Industrial Sites
- o Non-bearing fruit and nut trees and non-bearing vineyards
- o Established Warm Season Turf (including Bahiagrass, Bermudagrass, Buffalograss, Centipedegrass, St. Augustinegrass and Zoysiagrass)
- o Tall Fescue (warm season areas)

Active Ingredient:

oryzalin: 3,5-dinitro- <i>N,N,N'</i> -	
dipropylsulfanilamide .....	40.4%
Inert Ingredients .....	59.6%
Total .....	100.0%

Contains 4.0 pounds of active ingredient per gallon.

**Keep Out of Reach of Children**

## **CAUTION PRECAUCION**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

---

### Precautionary Statements

---

**Hazards to Humans and Domestic Animals**

~~Keep Out of Reach of Children~~

## ~~CAUTION PRECAUCION~~

~~Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)~~

~~Causes Eye Irritation o Harmful If Swallowed, Inhaled Or Absorbed Through The Skin o SurPan A.S. May Cause Skin Sensitization Reactions In Certain Individuals Prolonged or frequently repeated contact may cause allergic reactions in some individuals~~

~~Avoid contact with skin, eyes or clothing. Avoid breathing vapor or spray mist.~~

## Personal Protective Equipment (PPE)

### Applicators and other handlers must wear:

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

Discard clothing 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, use detergent and hot water. Keep and wash PPE separately from other laundry.

## Engineering Controls Statements

When handlers use closed systems, enclosed cabs, or aircraft 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 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.

## First Aid

**If in eyes:** Flush with plenty of water. Get medical attention if irritation ~~develops~~ persists.

**If on skin:** Wash with plenty of soap and water. Get medical attention if irritation ~~develops~~.

**If swallowed:** Do not induce vomiting. Call a physician or Poison Control Center. If available, administer activated charcoal (6-8 heaping teaspoonfuls) with a large quantity of water. Do not give anything by mouth to an unconscious person. Immediately transport to a medical care facility and see a physician.

**If inhaled:** Remove individual to fresh air. Get medical attention if breathing difficulty occurs. If not breathing, give artificial respiration, preferably cardiopulmonary resuscitation and get medical attention immediately.

## 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.

## Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. Refer to label booklet under "Agricultural Use Requirements" in the Directions for Use section for information about this standard.

**Refer to label booklet for ~~additional precautionary information including Personal Protective Equipment (PPE), User Safety Recommendations and Directions for Use, including Storage and Disposal.~~**

**Notice:** Read the entire label. Use only according to label directions. **Before buying or using this product, read "Warranty Disclaimer" and "Limitation of Remedies" inside label booklet.**

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994. If you wish to obtain additional product information, visit our web site at [www.dowagro.com](http://www.dowagro.com).

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

**Shake Well Before Using.**

EPA Reg. No. 62719-113

EPA Est. 37429-GA-01

\*Trademark of Dow AgroSciences LLC  
Dow AgroSciences LLC o Indianapolis, IN 46268 U.S.A.

**Specialty Herbicide**

**Net Contents XXX**

(Datapack cover):

(Logo) Dow AgroSciences LLC

## Surflan\* A.S.

A selective preemergence surface-applied herbicide for control of annual grasses and many broadleaf weeds in:

- o Landscape Ornamentals
- o Container Grown Ornamentals
- o Field Grown Ornamentals
- o Drainage Areas Under Shadehouse Benches
- o Ornamental Bulbs
- o Ground Covers/Perennials
- o Christmas Tree Plantations
- o Noncropland and Industrial Sites
- o Non-bearing fruit and nut trees and non-bearing vineyards
- o Established Warm Season Turf (including Bahiagrass, Bermudagrass, Buffalograss, Centipedegrass, St. Augustinegrass and Zoysiagrass)
- o Tall Fescue (warm season areas)

Active Ingredient:

oryzalin: 3,5-dinitro- <i>N,N,N'</i> -dipropylsulfanilamide .....	40.4%
Inert Ingredients .....	59.6%
Total .....	100.0%

Contains 4.0 pounds of active ingredient per gallon.

**Keep Out of Reach of Children**

### CAUTION PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

**Agricultural Use Requirements**

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. Refer to label booklet under "Agricultural Use Requirements" in the Directions for Use section for information about this standard.

Refer to inside of label booklet for additional precautionary information including Personal Protective Equipment (PPE), User Safety Recommendations and Directions for Use including Storage and Disposal.

**Notice:** Read the entire label. Use only according to label directions. Before buying or using this product, read "Warranty Disclaimer" and "Limitation of Remedies" inside label booklet.

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994. If you wish to obtain additional product information, visit our web site at [www.dowagro.com](http://www.dowagro.com).

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



9/34

**Shake Well Before Using.**

EPA Reg. No. 62719-113

EPA Est. 37429-GA-01

\*Trademark of Dow AgroSciences LLC  
Dow AgroSciences LLC o Indianapolis, IN 46268 U.S.A.

**Specialty Herbicide**

**Net Contents XXX**

(Page 1 through end):

<b>Table of Contents</b>	<b>Page</b>
Precautionary Statements	
Hazards to Humans and Domestic Animals	
First Aid	
Environmental Hazards	
Directions for Use	
Agricultural Use Requirements	
Storage and Disposal	
General Information	
Soil Preparation	
Mixing Directions	
Surflan A.S. Alone	
Surflan A.S. Tank Mix Combinations	
Mixing Order	
Premixing	
Equipment Cleaning	
Activation and Cultivation	
Weeds Controlled by Surflan A.S.	
Weeds Suppressed by Surflan A.S.	
Approved Uses	
Ornamental Plantings	
Broadcast Application Rates	
Tank Mix Combinations	
Special Use Precautions	
Recommended Species	
Field and Container Grown Species	
Non-bearing Trees and Vines	
Ornamental Bulbs	
Broadcast Application Rates	
Special Use Precautions	
Shadehouse Areas	
Christmas Tree Plantations	
Surflan A.S. Alone	
Broadcast Application Rates	
Tank Mix Combinations	
Special Use Precautions	
Noncropland Areas and Industrial Sites	
Noncropland Areas—Tank Mix Combinations	
Broadcast Application Rates	
Industrial Sites—Tank Mix Combinations	
Warm Season Turfgrasses	
Annual Grasses Controlled by Surflan A.S.	
Annual Broadleaf Weeds Controlled by Surflan A.S.	
Broadleaf Weeds Suppressed by Surflan A.S.	
Application Rates, Frequency and Timing of Application	
Summer Annual Grasses and Broadleaf Weeds	
Single Application Program	
Split Application Program	
Annual Bluegrass ( <i>Poa annua</i> ) and Winter Annual Broadleaf Weeds	
Broadcast Application Rates	

Weed Control in Florida  
Application Equipment  
Reseeding  
Special Use Precautions  
Warranty Disclaimer  
Inherent Risks of Use  
Limitation of Remedies

## Precautionary Statements

### Hazards to Humans and Domestic Animals

## CAUTION PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

~~Causes Eye Irritation or Harmful if Swallowed, Inhaled Or Absorbed Through The Skin of Surflan A.S. May Cause Skin Sensitization Reactions In Certain Individuals~~ Prolonged or frequently repeated contact may cause allergic reactions in some individuals

~~Avoid contact with skin, eyes or clothing. Avoid breathing vapor or spray mist.~~

### Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

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

Discard clothing 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, use detergent and hot water. Keep and wash PPE separately from other laundry.

### Engineering Controls Statements

When handlers use closed systems, enclosed cabs, or aircraft 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 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.

### First Aid

~~If in eyes:~~ Flush with plenty of water. Get medical attention if irritation develops persists.

~~If on skin:~~ Wash with plenty of soap and water. Get medical attention if irritation develops.

~~If swallowed:~~ Do not induce vomiting. Call a physician or Poison Control Center. If available, administer activated charcoal (6-8 heaping teaspoonfuls) with a large quantity of water. Do not give anything by mouth to an unconscious person. Immediately transport to a medical care facility and see a physician.

~~If inhaled:~~ Remove individual to fresh air. Get medical attention if breathing difficulty occurs. If not breathing, give artificial respiration, preferably cardiopulmonary resuscitation and get medical attention immediately.

### 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 ~~42~~ 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, 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:

- o Coveralls
- o ~~Waterproof~~ Chemical-resistant gloves
- o Shoes plus socks
- o ~~Protective~~ eyewear

### Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for Agricultural Pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Entry Restrictions for Non-WPS Uses: Keep all persons, children and pets out of treated area until sprays have dried.

### Storage and Disposal

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

**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 the use of this product may be disposed of on site or at an approved waste disposal facility.

**Container Disposal:** Triple rinse (or equivalent). Then offer for recycling or reconditioning, 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 product for the control of many annual grasses and broadleaf weeds in ornamental plantings, bulbs, ground covers/perennials, established warm-season turfgrass, Christmas tree plantations, non-bearing trees and vines, and noncropland 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 mulch colorants, such as Mulch Magic or Nu-Mulch.

#### **Treatment of Plant Species Not Listed on the Label for Surflan A.S.**

Users who wish to use Surflan A.S. on plant species not recommended on this label may determine the suitability for use by treating a small number of such plants at a recommended rate. Prior to treatment of larger areas, the treated plants should be observed for any sign of herbicidal injury during 30-60 days of normal growing conditions to determine if the treatment is non-injurious to the target plant species. The user assumes responsibility for any plant damage or other liability resulting from use of Surflan A.S. on plant species not recommended on this label.

**Aerial Application:** Do not aerially apply this product.

**Chemigation:** Do not apply this product through any type of irrigation system.

Do not graze or feed forage from treated areas to livestock.

**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 or excessive soil residue.

## Application

### 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 stolens, 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 tilth and free of clods at the time of application.

**Ground Application:** Apply Surflan A.S. as a directed spray to the soil surface or over the top of plants. Use only a properly calibrated, low-pressure, herbicide sprayer that will apply the spray uniformly. Use screens no finer than 50 mesh in nozzles and in-line strainers. Apply the appropriate rate of Surflan A.S., as outlined in "Approved Uses" section of this label. In all cases, use sufficient water volume to obtain uniform coverage and deliver the desired rate of Surflan A.S. to the treated area. The volume of water used is not critical, as long as the desired rate of Surflan A.S. is delivered uniformly across the area treated. When calibrating, determine the volume of water delivered by the sprayer to a given area (1,000 sq ft, 1 acre, etc.). Then mix the desired rate of Surflan A.S. in the amount of water required to cover the entire area to be treated. As the amount of water used (spray volume) decreases, the importance of

accurate calibration and uniform application increases. Check the sprayer daily to ensure proper calibration and uniform application. Maintain continuous agitation from mixing through application. Avoid spray pattern skips and overlaps that may result in incomplete coverage or over-application.

**Hand Held or Backpack Sprayer Application:** The amount of water used to apply Surflan A.S. herbicide is *not* critical, but should be sufficient for uniform coverage of the target area. Calibrate by determining the volume of water required to treat 1000 square feet. Use this calibration volume to determine the amount of water and Surflan A.S. herbicide needed to treat the target area (see the following calibration example). **Note:** Sprayer calibration (volume of spray needed to treat 1,000 square feet) will vary with each individual operator.

**Steps in Calibration:**

1. Mark an area of 1,000 square feet (i.e. 20 by 50 feet, or 25 by 40 feet).
2. Place the sprayer on a level surface and add water noting the final level of water in the spray tank.
3. Spray the marked area with a sufficient volume of water to provide uniform coverage. Refill the sprayer to the same level as before measuring the amount of water added. The measured water added to the sprayer is the volume needed to cover 1,000 square feet.
4. Determine the application rate (fl oz/1000 sq ft) for Surflan A.S. from the "Approved Uses" section of this label.
5. To each volume of water used, as measured in step 3, add the amount of Surflan A.S. as determined in step 4.

**Example:** If the sprayer used 2 gallons of water to cover 1,000 square feet and the desired application rate of Surflan A.S. is 3 fluid oz/1,000 square feet, then you would add 3 fluid ounces of Surflan A.S. to every 2 gallons of water to be used.

~~**Aerial Application:** Do not aerially apply this product.~~

~~**Chemigation:** Do not apply this product through any type of irrigation system.~~

~~**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 or excessive soil residue.~~

## Mixing Directions

### Shake Well Before Using

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

### Surflan A.S. - Alone

Make sure spray tank is clean and use only clean water. Fill spray tank 1/2 - 3/4 full. Start agitation and add the required amount of Surflan A.S. Continue agitation and finish filling the spray tank. Maintain continuous agitation until application is completed.

### Surflan A.S. - Tank Mix Combinations

Prior to mixing, read and carefully follow all label instructions and precautions for each product added to the tank mixture. Vigorous, continuous agitation is required for all tank mixes of Surflan A.S. Sparger pipe agitators generally provide the best agitation in spray tanks.

**Mixing Order:** Fill the tank 3/4 full with clean water. Start agitation and add different formulation types in the order indicated below, allowing time for complete mixing and dispersion after addition of each product. Allow extra mixing and dispersion time for dry flowable products.

Add different formulation types in the following order: dry flowables (DF); wettable powders (WP); Surflan A.S. and other aqueous suspensions (AS), flowables (F), and liquids (L); solutions (S); and emulsifiable concentrates (EC).

Continue agitation and finish filling the spray tank with clean water. Maintain agitation until application is completed. If spraying and agitation must be stopped before the spray tank is empty, the materials may settle to the bottom. Settled materials must be completely resuspended before spraying is continued. A sparger agitator is particularly useful for this purpose.

**Premixing:** When tank mixing, initial mixing and dispersion of certain dry flowable or wettable powder products may be improved by premixing with water (slurrying). Adding the slurried material to the spray tank through a 20 or 35 mesh wetting screen will help assure good initial dispersion.

### Equipment Cleaning

If a buildup of material occurs on the walls of the spray tank, it should be removed between fillings by washing with soap and water and rinsing thoroughly. Tanks, lines, screens, and nozzles should be cleaned thoroughly after each use.

### Activation and Cultivation

Surflan A.S. will remain stable on the soil surface up to 21 days following application. In the absence of timely rainfall, irrigation can be used to activate Surflan A.S. A minimum of one-half (1/2) inch of rain or its equivalent in sprinkler irrigation is necessary to activate Surflan A.S.. If weeds begin to emerge due to lack of rainfall or irrigation, shallow cultivate 1-2 inches deep to destroy existing weeds, or remove them by hand. Shallow cultivation to a depth of 1-2 inches will enhance herbicidal effectiveness. If Surflan A.S. is not activated by rainfall, irrigation, or cultivation within 21 days of application, or existing weeds have not been removed, erratic weed control may result.

## Weeds Controlled by Surflan A.S.

### Annual Grasses:

Common Name	Scientific Name
barley, little	<i>Hordeum pusillum</i>
barnyardgrass (watergrass)	<i>Echinochloa crus-galli</i>
bluegrass, annual	<i>Poa annua</i>
crabgrass, large	<i>Digitaria sanguinalis</i>
crabgrass, smooth	<i>Digitaria ischaemum</i>
crowfootgrass	<i>Dactyloctenium aegyptium</i>
cupgrass, southwestern	<i>Eriochloa gracilis</i>
foxtail, bristlegrass	<i>Setaria magna</i>
foxtail, giant	<i>Setaria faberi</i>
foxtail, green (pigeongrass)	<i>Setaria viridis</i>
foxtail, robust	<i>Setaria robusta</i>
foxtail, yellow	<i>Setaria glauca</i>
goosegrass (silver crabgrass)	<i>Eleusine indica</i>
Johnsongrass (seedling only)	<i>Sorghum halepense</i>
junglerice	<i>Echinochloa colonum</i>
lovegrass, Mexican	<i>Eragrostis mexicana</i>
lovegrass, orcutt	<i>Eragrostis orcuttiana</i>
oat, wild	<i>Avena fatua</i>



panicum, browntop	<i>Panicum fasciculatum</i>
panicum, fall	<i>Panicum</i>
(spreading panicgrass)	<i>dichotomiflorum</i>
panicum, Texas	<i>Panicum texanum</i>
(buffalograss)	
(Coloradograss)	
ryegrass, Italian	<i>Cenchrus incertus</i>
signalgrass (Brachiaria)	<i>Brachiaria</i> spp.
sprangletop, red	<i>Leptochloa filiformis</i>
witchgrass	<i>Panicum capillare</i>

**Broadleaf Weeds:**

<b>Common Name</b>	<b>Scientific Name</b>
bittercress	<i>Cardamine oligosperma</i>
carpetweed	<i>Mollugo verticillata</i>
chickweed, common	<i>Stellaria media</i>
fiddleneck, coast	<i>Amsinckia intermedia</i>
filaree, redstem	<i>Erodium cicutarium</i>
filaree, whitestem	<i>Erodium moschatum</i>
groundsel, common	<i>Senecio vulgaris</i>
henbit	<i>Lamium amplexicaule</i>
knotweed, prostrate	<i>Polygonum aviculare</i>
lambsquarters	<i>Chenopodium album</i>
pigweed, prostrate	<i>Amaranthus blitoides</i>
pigweed, redroot	<i>Amaranthus retroflexus</i>
pigweed, spring	<i>Amaranthus hybridus</i>
pigweed, tumble	<i>Amaranthus albus</i>
puncturevine	<i>Tribulus terrestris</i>
purslane, common	<i>Portulaca oleracea</i>
pusley, Florida (Florida purslane)	<i>Richardia scabra</i>
(Mexican clover)	
(pusley)	
rocket, London	<i>Sisymbrium irio</i>
rockpurslane, desert	<i>Calandrinia ciliata</i>
shepherdspurse	<i>Capsella bursa-pastoris</i>
spurge, prostrate	<i>Euphorbia humistrata</i>
woodsorrel, yellow	<i>Oxalis stricta</i>

**Weeds Suppressed by Surflan A.S.**

Control of the following weeds may be erratic, ranging from poor to excellent, depending upon soil temperature, time of germination, depth of seed in the soil, and amount and timing of soil moisture:

<b>Common Name</b>	<b>Scientific Name</b>
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	<i>Ipomoea</i> spp.
mustard, black	<i>Brassica nigra</i>
mustard, wild	<i>Brassica kaber</i>
nightshade, black	<i>Solanum nigrum</i>
ragweed, common	<i>Ambrosia artemisiifolia</i>
smartweed	<i>Polygonum pensylvanicum</i>
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.

## Approved Uses

### Ornamental Plantings

Surflan A.S. is recommended for use on certain landscape container- and field-grown established ornamental plants including: trees, shrubs, ground covers/perennials, flowers, non-bearing fruit and nut trees, non-bearing vineyards; and in the production of ornamental bulbs (See "Ornamental Bulbs" section for special use directions).

### Broadcast Application Rates

<u>Labeled Use Site</u>	<u>Length of Control</u>	<u>Surflan A.S.</u>		<u>Minimum Time Between Applications (months)</u>	<u>Total Amount Allowed Per Year (qt/acre)</u>
		<u>(qt/acre)</u>	<u>(fl oz/1000 sq ft)</u>		
<u>Landscape Ornamentals</u>	2 - 4 months	2	1.5	2	8
	3 - 6 months	3	2.2	4	12
	4 - 8 months	4	3	4	12
<u>Field-grown and container-grown ornamentals</u>	2 - 4 months	2	1.5	3	8
	3 - 6 months	3	2.2	3	9
	4 - 8 months	4	3	3	12

### Tank Mix Combinations

Tank mix combinations of Surflan A.S. plus Roundup, and many other labeled herbicides may be used to control undesirable vegetation in ornamental areas. Surflan A.S. may also be tank mixed with Gallery\* herbicide and applied preemergence to broaden the spectrum of broadleaf weed control in ornamental areas. Applied as directed, these tank mixes of Surflan A.S. will provide control of susceptible weed species listed on the respective labels. Refer to tank mix product labels for specific use directions, precautions, and limitations before use.

**Surflan A.S. Plus Roundup:** Tank mix combinations of Surflan A.S. plus Roundup are recommended to control existing undesirable vegetation. Applied as directed, Surflan A.S. plus Roundup will provide postemergence control of susceptible weed species listed on the label for Roundup and residual preemergence control of susceptible weed species listed on the label for Surflan A.S. Refer to the label for Roundup for specific use directions, precautions, and limitations before use.

**Precautions:** Do not apply sprays containing Roundup over the top of ornamental plants. Extreme care must be exercised to prevent sprays containing Roundup from coming in contact with foliage and stems of turfgrasses, trees, shrubs, or other desirable vegetation since severe damage or death may result. If spraying with Roundup in areas adjacent to desirable plants, use a shield to prevent spray from contacting foliage and stems of desirable plants.

### Special Use Precautions:

Apply only to established plants that have been transplanted into their 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.

Rooted liners should be removed from their original growing containers and placed in new containers at least two weeks prior to treatment or injury may occur.

To avoid possible injury, do not apply Surflan A.S. to:

- o Nursery, forest, or Christmas tree: seedling beds, cutting beds, or transplant beds.
- o Unrooted liners or cuttings that have been planted in pots for the first time.
- o Pots less than four inches wide.

- o Ground covers until they are established and well rooted.
- o Ornamental plantings where there is likelihood of runoff onto lawn areas.
- o Areas containing dichondra or cool season turfgrass species.

On container grown ornamentals where weed seed germination continues for extended periods of time, do not make repeat applications of Surflan A.S. for at least 90 days or crop injury may occur.

Applications of Surflan A.S. over the top of plants with newly forming buds may cause injury. In this situation a directed spray is recommended.

For soils treated with Surflan A.S. during the previous season, plant only the ornamental species listed on this label or injury may occur.

**Ice Plant:** When establishing unrooted ice plant on coarse-textured soils in landscape plantings, do not exceed the 2 quart per acre rate of Surflan A.S. or crop injury may occur.

**Note: Injury on the following plant species has been observed following applications of Surflan A.S. and use is not recommended:**

*Deutzia gracilis* (slender deutzia)  
*Pseudotsuga menziesii* (Douglas-fir)  
*Thuja occidentalis* 'Techny' (Techny arborvitae)  
*Tsuga canadensis* (eastern hemlock)  
*Begonia* spp. (begonia)  
*Coleus hybridus* (coleus)

**Surflan A.S. May be Used on the Following Established Plant Species:**  
 (Note: Limitations on recommended treatment methods).

## Trees

## Recommended Treatment Method

F = Field Grown  
 C = Container Grown

Scientific Name	Common Name	
<i>Abies balsamea</i>	Fir, balsam	F
<i>Abies concolor</i>	Fir, white	F
<i>Abies fraseri</i>	Fir, fraser	F
<i>Abies grandis</i>	Fir, grand	F
<i>Abies veitchi</i>	Fir, Vietch	F
<i>Abies lasiocarpa</i>	Fir, alpine	F
<i>Abutilon hybridum</i>	Albus-flowering maple	F
	Luteus-flowering maple	F
	Roseus-flowering maple	F
	Tangerine-flowering maple	F
	Vesuvius red-flowering maple	F
<i>Acer ginnala</i>	Flame maple	F
<i>Acer rubrum</i>	Red sunset maple	F
<i>Acer saccharinum</i>	Silver maple	F
<i>Acer</i> spp.	Maple	F
<i>Areacastrum romanzoffianum</i>	Queen palm	F
<i>Betula nigra</i>	Birch, river	F
<i>Betula papyrifera</i>	Paper birch	F
<i>Betula pendula</i>	Birch, white	F
<i>Bucida buceras</i>	Black olive	F
<i>Carya</i> spp.	Pecan, ornamental	C,F
<i>Ceratonia siliqua</i>	Carob	F
<i>Cercidium floridum</i>	Palo Verde, blue	F

<i>Cercis canadensis</i>	Redbud	C,F
<i>Chamaecyparis lawsoniana</i>	Falsecypress, Lawson	F
<i>Chamaecyparis obtusa</i>	Filicoides-fernspray cypress	F
	Gracilis-slender Hinoki cypress	F
<i>Chamaecyparis pisifera</i>	Sawara-false cypress	F
	Squarrosa-moss cypress	F
<i>Chamaedorea cataractarum</i>	Cat Palm	F
<i>Chamaedorea costaricana</i>	Palm	F
<i>Chamaedorea elegans</i>	Parlor palm	F
<i>Citrus spp.</i>	Citrus, ornamental	C,F
<i>Cornus florida</i>	Dogwood, flowering	F
<i>Cryptomeria japonica</i>	Cryptomeria, Japanese	C,F
<i>Cupaniopsis anacardioides</i>	Carrot wood	F
<i>Cupressus arizonica (glabra)</i>	Cypress, Arizona	C,F
<i>Cupressus glabra</i>	Arizona cypress	C,F
<i>Cupressus sempervirens</i>	Cypress, Italian	C,F
<i>Elaeagnus angustifolia</i>	Russian olive	C,F
<i>Eucalyptus camaldulensis</i>	Red gum eucalyptus	F
<i>Eucalyptus cinerea</i>	Eucalyptus, mealy	F
	Silver dollar eucalyptus	F
<i>Eucalyptus nicholii</i>	Eucalyptus, narrow-leaved	F
<i>Eucalyptus sideroxylon</i>	Eucalyptus, red ironbark	F
<i>Ficus benjamina</i>	Ficus	F
<i>Fraxinus spp.</i>	Ash	F
<i>Ginkgo biloba</i>	Ginkgo (Maidenhair tree)	C,F
<i>Gleditsia triacanthos</i>	Honey locust	F
<i>Heteromeles arbutiflora</i>	Toyon	F
<i>Juniperus virginiana</i>	Redcedar, Eastern	F
<i>Koelreuteria paniculata</i>	Goldenrain tree	F
<i>Liquidambar styraciflua</i>	Sweetgum, American	C,F
<i>Magnolia grandiflora</i>	Magnolia, Southern	F
<i>Malus spp.</i>	Crabapple	F
<i>Morus alba</i>	White mulberry	F
<i>Picea abies</i>	Pendula-weeping Norway spruce	F
	Repens-spreading Norway spruce	F
	Spruce, Norway	F
<i>Picea englemanni</i>	Spruce, Englemann	F
<i>Picea glauca</i>	Spruce, white	F
	Conica-dwarf Alberta spruce	F
<i>Picea glauca conica</i>	Dwarf Alberta spruce	F
<i>Picea mariana</i>	Spruce, black	F
<i>Picea pungens</i>	Glauca-Colorado blue spruce	F
	Hoopsii-Hoop's blue spruce	F
	Koster-Koster blue spruce	F
	Spruce, Colorado	C,F
<i>Pinus aristata</i>	Bristlecone pine	F
<i>Pinus canariensis</i>	Canary Island pine	F
<i>Pinus contorta</i>	Shore pine, beach pine	F
<i>Pinus eldarica</i>	Eldarica pine	F
<i>Pinus radiata</i>	Monterey pine	F
<i>Pinus spp.</i>	Pine	C,F
<i>Pinus strobus</i>	Eastern white pine	F
<i>Pinus sylvestris</i>	Scotch pine	F
<i>Pinus thunbergiana</i>	Japanese black pine	F

<i>Platanus occidentalis</i>	American sycamore	F
<i>Platanus racemosa</i>	Califorina sycamore	F
<i>Podocarpus spp.</i>	Podocarpus	F
<i>Populus deltoides</i>	Cottonwood	F
	Cottonwood (grown for pulp)	F
<i>Prunus caroliniana</i>	Laurelcherry, Carolina	F
<i>Prunus laurocerasus</i>	Laurelcherry, English	F
<i>Prunus mahaleb</i>	Cherry, Mahaleb	F
<i>Prunus yedoensis</i>	Yoshino flowering cherry	F
<i>Pyrus communis</i>	Pear	F
<i>Quercus palustris</i>	Pin oak	F
<i>Quercus phellos</i>	Willow oak	F
<i>Quercus rubra</i>	Red oak	C,F
<i>Quercus spp.</i>	Oak	C,F
<i>Salix babylonica</i>	Babylon weeping willow	F
	Corkscrew willow	F
<i>Schinus molle</i>	California pepper tree	F
<i>Sequoia sempervirens</i>	Redwood, coast	F
<i>Sequoiadendron giganteum</i>	Giant sequoia	F
<i>Swietenia mahogani</i>	Mahogany	F
<i>Tabebuia caraiba</i>	Yellow tab	F
<i>Tilia cordata</i>	Linden, little leaf	C,F
<i>Ulmus parvifolia</i>	Chinese elm	F
<i>Umbellularia californica</i>	California laurel	F
<i>Washingtonia robusta</i>	Mexican fan palm	F

**Shrubs****Recommended Treatment Method**

F = Field Grown

C = Container Grown

<b>Scientific Name</b>	<b>Common Name</b>	
<i>Abelia grandiflora</i>	Glossy abelia	F
<i>Acacia redolens</i>	Acacia, prostrate	F
<i>Agave americana</i>	Century plant	F
<i>Agave macroculmis</i>	Agave	F
<i>Arctostaphylos stanfordiana</i>	Manzanita, Stanford	F
<i>Astilbe chinensis</i>	Astilbe/false spirea	C,F
<i>Baccharis pilularis</i>	Coyotebush	F
<i>Berberis thunbergii</i>	Aurea-golden Japanese barberry	C,F
	Crimson pygmy barberry	C,F
	Atropurea-redleaf Japanese barberry	C,F
	Barberry, Japanese	C,F
<i>Bougainvillea spp.</i>	Barbara Karst	F
	California gold	F
	Scarlet O'Hara	F
	Texas dawn	F
<i>Buxus microphylla</i>	Littleleaf boxwood	F
<i>Buxus microphylla japonica</i>	Boxwood, Japanese	C,F
<i>Buxus sempervirens</i>	Boxwood, common	C,F
<i>Callistemon citrinus</i>	Bottlebrush, lemon	C,F
<i>Cassia artemisioides</i>	Cassia, feathery	F
<i>Ceanothus americanus</i>	Jerseytea, redroot	C,F
<i>Ceanothus spp.</i>	Wild lilac	C,F

<i>Chamaecyparis obtusa</i>	Kosteri cypress	F
	Nana-dwarf Hinoki cypress	F
	Torulosa cypress	F
<i>Chamaecyparis pisifera</i>	Squarrosa Minima cypress	F
<i>Chamaecyparis pisifera</i> spp.	Filifera-thread cypress	F
<i>Chrysalidocarpus lutescens</i>	Areca palm	F
<i>Cleyera japonica</i>	Cleyera, Japanese	C,F
<i>Cornus alba</i>	Sibirica-Siberian dogwood	F
<i>Cornus kousa</i>	Dogwood, kousa	C,F
<i>Cornus stolonifera</i>	Flaviramea-yellowtwig dogwood	F
<i>Cotoneaster adpressus</i>	Praecox-early cotoneaster	F
<i>Cotoneaster apiculatus</i>	Cotoneaster, cranberry	C,F
<i>Cotoneaster buxifolius</i>	Cotoneaster, brightbead	F
<i>Cotoneaster congestus</i>	Cotoneaster, Pyrenees	F
<i>Cotoneaster dammeri</i>	Cotoneaster, bearberry	C,F
<i>Cotoneaster himalayan</i>	Himalayan cotoneaster	F
<i>Cotoneaster horizontalis</i>	Cotoneaster, rock	C,F
<i>Cotoneaster lacteus</i>	Cotoneaster, parney	C,F
<i>Cotoneaster microphyllus</i>	Cotoneaster, rockspray	F
<i>Cytisus praecox</i>	Hollandia-warminster broom	F
<i>Cytisus scoparius</i>	Lena-Scotch broom	F
<i>Dasyliirion wheeleri</i>	Sotol, desert spoon	F
<i>Deutzia crenata</i>	Nakiana-dwarf deutzia	F
<i>Dodonaea viscosa</i>	Hopseedbush, clammy	F
	Hopseed bush	F
<i>Escallonia exoniensis</i>	Escallonia	C,F
<i>Euonymus alata</i>	Euonymus, winged	F
<i>Euonymus fortunei</i>	Canadale gold euonymus	C,F
	Emerald'n gold euonymus	C,F
	Euonymus, stringybark	C,F
	Wintercreeper	C,F
<i>Euonymus japonica</i>	Euonymus, evergreen	C,F
	Silver king euonymus	F
<i>Euonymus kiatschovica</i>	Spreading euonymus	F
<i>Fatsyhedera lizei</i>	Fatsyhedera	C,F
<i>Forsythia intermedia</i>	Forsythia, border	F
<i>Gardenia jasminoides</i>	Gardenia	C,F
<i>Genista pilosa</i>	Woadwaxen	F
<i>Hibiscus rosa-sinensis</i>	Ross Estey-hibiscus	F
	Hibiscus, Chinese	F
<i>Hibiscus syriacus</i>	Rose of Sharon, Red Bird	F
	Rose of Sharon, Red Heart	F
	Rose of Sharon, Woodbridge	F
	Rose-of-Sharon (Shrubalthea)	F
<i>Ilex aquifolium</i>	Balkans holly	F
	Gold coast holly	F
	Holly, English	F
<i>Ilex aquipernyi</i>	San Jose holly	C,F
<i>Ilex cornuta</i>	Dwarf Burford holly	C,F
	Holly, Chinese	C,F
<i>Ilex crenata</i>	Compacta-dwarf Japanese holly	C,F
	Convexa holly	C,F
	Helleri-Heller's Japanese holly	C,F
	Holly, Japanese	C,F

<i>Ilex glabra</i>	Nordica-inkberry holly	F
<i>Ilex meserveae</i>	Blue boy holly	F
	Blue girl holly	F
	Ebony magic holly	F
<i>Ilex vomitoria</i>	Nana-dwarf yaupon holly	C,F
	Pendula-weeping yaupon holly	C,F
	yaupon holly	C,F
<i>Juniperus chinensis</i>	Media-old gold juniper	C,F
<i>Juniperus conferta</i>	Emerald sea shore juniper	F
<i>Juniperus horizontalis</i>	Huntington blue juniper	C,F
	Wiltonii-blue carpet juniper	C,F
<i>Juniperus procumbens</i>	Nana-dwarf Japaneses garden juniper	C,F
<i>Juniperus prostrata</i>	Prostrata juniper	C,F
<i>Juniperus sabina</i>	Broadmoor juniper	F
	Foemina-Hicks juniper	F
	Tamariscifolia-Tam juniper	F
<i>Juniperus scopulorum</i>	Emerald green juniper	F
<i>Juniperus spp.</i>	Juniper	C,F
<i>Juniperus squamata</i>	Blue juniper	F
	Blue star juniper	F
	Parsonii juniper	F
<i>Justicia brandegeana</i>	Shrimp plant	C,F
<i>Justicia spicigera</i>	Honeysuckle, Mexican	F
<i>Kalmia latifolia</i>	Laurel, mountain	F
<i>Lagerstroemia indica</i>	Crape myrtle	C,F
<i>Leucothoe axillaris</i>	Leucothoe, coast	F
<i>Leucothoe fontanesiana</i>	Leucothoe, drooping	F
<i>Ligustrum amurense</i>	Privet, amur	C,F
<i>Ligustrum japonicum</i>	Privet, Japanese	C,F
	yellow tip ligustrum	C,F
<i>Ligustrum lucidum</i>	Privet, glossy	C,F
<i>Ligustrum ovalifolium</i>	California privet	F
<i>Ligustrum texanum</i>	Howardi privet	F
	Wax leaf privet	F
<i>Ligustrum vicaryi</i>	Privet, golden	C,F
	Vicary golden privet	C,F
<i>Livistona chinensis</i>	Chinese fountain palm	F
<i>Lonicera fragrantissima</i>	Winter honeysuckle	F
<i>Lonicera periclymenum</i>	Flowering woodbine	F
	Serotina woodbine	F
<i>Lonicera sempervirens</i>	Trumpet honeysuckle	F
<i>Mahonia aquifolium</i>	Oregon grape	F
<i>Myoporum parvifolium</i>	Myoporum, prostrate	F
<i>Myrtus communis</i>	Myrtle, true	C,F
<i>Nandina domestica</i>	Compacta-dwarf heavenly bamboo	C,F
	Harbour dwarf-heavenly bamboo	C,F
	Heavenly bamboo (Nandina)	C,F
	Nana compacta-heavenly bamboo	C,F
	Nana purpurea-heavenly bamboo	C,F
	Woods dwarf-heavenly bamboo	C,F
<i>Nerium oleander</i>	Hardy red oleander	C,F
	Oleander	C,F
	Ruby lace oleander	C,F
<i>Osmanthus heterophyllus</i>	Osmanthus, holly-leaf	F



<i>Philadelphus spp.</i>	Mockorange	C,F
<i>Phoenix roeloenii</i>	Pigmy date palm	F
<i>Photinia fraseri</i>	Fraser's photinia	C,F
	Photinia	C,F
<i>Pieris japonica</i>	Lily-of-the-valley	F
	Snowdrift lily-of-the-valley	F
	Temple bells lily-of-the-valley	F
	Valley rose lily-of-the-valley	F
	Andromeda	C,F
<i>Pittosporum spp.</i>	Pittosporum	C,F
<i>Pittosporum tobira</i>	Green pittosporum	F
	Japanese pittosporum	F
	Tobira	F
	Wheeler's dwarf pittosporum	F
<i>Platycladus orientalis</i>	Arborvitae, Oriental	C,F
<i>Plumbago ariculata</i>	Blue cape plumbago	F
<i>Podocarpus macrophyllus</i>	Yewpine	C,F
<i>Potentilla fragiformis</i>	Cinquefoil	F
<i>Potentilla fruticosa</i>	Cinquefoil	C,F
<i>Protea neriifolia</i>	Protea	F
<i>Pyracantha coccinea</i>	Firethorn, scarlet	C,F
<i>Pyracantha fortuneana</i>	Lolendei Monrovia pyracantha	C,F
<i>Pyracantha fortuneana</i>	Monon pyracantha	C,F
	Red elf hybrid pyracantha	C,F
	Rutgers hybrid pyracantha	C,F
	Santa Cruz pyracantha	C,F
	Victory pyracantha	C,F
<i>Pyracantha skoidzumi</i>	Firethorn, formosa	C,F
<i>Pyracantha, fortuneana</i>	Firethorn	C,F
<i>Rhaphiolepis indica</i>	Enchantress-Moness rhaphiolepis	F
	Rhaphiolepis (India hawthorn)	C,F
	Springtime-Monme rhaphiolepis	F
<i>Rhaphiolepis ovata</i>	Roundleaf rhaphiolepis	F
<i>Rhipsalidopsis gaertneri</i>	Eastercactus	C,F
<i>Rhododendron calendulaceum</i>	Flame azalea	F
<i>Rhododendron campylocarpum</i>	Butterfly rhododendron	F
<i>Rhododendron carolinianum x daurium</i>	PJM rhododendron	F
<i>Rhododendron catawbiense</i>	Catawba album rhododendron	C,F
	Catawba rhododendron	C,F
	Lord Roberts rhododendron	C,F
	Rocket rhododendron	C,F
<i>Rhododendron forrestii x griersonianum</i>	Elizabeth rhododendron	F
<i>Rhododendron hybrid spp.</i>	America rhododendron	F
	English Roseum rhododendron	F
	Nova Zembra rhododendron	F
	Scintillation rhododendron	F
<i>Rhododendron impeditum</i>	Rhododendron	F
<i>Rhododendron indica</i>	Formosa azalea	C,F
	Waucabusa azalea	C,F
<i>Rhododendron kerume</i>	Coral bells azalea	C,F
	Hino crimson azalea	C,F
	Hino pink azalea	C,F
	Snow azalea	C,F
<i>Rhododendron maximum</i>	Rhodie max (rosebay)	C,F

<i>Rhododendron mucronulatum</i>	Rhododendron	F
<i>Rhododendron satuski</i>	Gumpo pink azalea	F
	Higasa azalea	F
<i>Rhododendron</i> spp.	Azalea	C,F
	Rhododendron	C,F
<i>Rhododendron</i> spp. hybrids	Carror azalea	C,F
	Girard Roberta azalea	F
	Golden flare exbury azalea	F
<i>Rhus lancea</i>	Sumac, African	C,F
<i>Rosa rugosa</i>	Ramanas rose	F
<i>Rosmarinus officinalis</i>	Rosemary	F
<i>Spiraea vanhouttei</i>	Bridal wreath	F
<i>Syringa vulgaris</i>	Lilac, common	C,F
<i>Syzygium paniculata</i>	Brush cherry	C,F
<i>Taxus cuspidata</i>	Yew, Japanese	F
<i>Taxus media</i>	Yew	F
<i>Thuja occidentalis</i>	Arborvitae, American	C,F
	Emerald arborvitae	F
	Globosa-globe arborvitae	F
	Little giant-dwarf arborvitae	F
	Nigra-dark American arborvitae	F
	Pyramidalis arborvitae	F
	Rheingold arborvitae	F
	Woodwardii arborvitae	F
<i>Thuja orientalis</i>	Aureus nana-dwarf golden arborvitae	F
	Minima glauca-dwarf arborvitae	F
<i>Thuja plicata</i>	Red Cedar, Western	F
<i>Trachelospermum jasminoides</i>	Star jasmine, Chinese	F
<i>Veitchia merrilli</i>	Christmas palm	F
<i>Viburnum davidii</i>	David viburnum	F
<i>Viburnum japonicum</i>	Viburnum	F
<i>Viburnum opulus sterile</i>	Common snowball viburnum	F
<i>Viburnum plicatum tomentosum</i>	Doublefile viburnum	F
<i>Viburnum setigerum</i>	Tea viburnum	F
<i>Virbunum suspensum</i>	Virbumum, Sandankwa	F
<i>Viburnum tinus</i>	Viburnum, Laurustinus	C,F
	Compactum-spring bouquet viburnum	F
<i>Viburnum tinus compactum</i>	Spring bouquet viburnum	F
<i>Viburnum trilobum compactum</i>	Dwarf cranberry bush	F
<i>Viburnum x pragense</i>	Viburnum	F
<i>Weigela florida</i>	• Bristol ruby weigela	F
	Java red weigela	F
	Minuet weigela	F
	Weigela, oldfashioned	F
<i>Xylosma congestum</i>	Xylosma	F
<i>Yucca elata</i>	Yucca, soaptree	C,F
<i>Yucca recurvifolia</i>	Yucca, pendulous	F

**Groundcovers/Perennials****Recommended Treatment Method****F = Field Grown****C = Container Grown****Scientific Name****Common Name**

<i>Agapanthus africanus</i>	Lily-of-the-Nile	C,F
<i>Ajuga</i> spp.	Carpet bugle	F
<i>Arctotheca calendula</i>	Cape weed	F
<i>Campanula elatines</i>	Bellflower	C,F
<i>Carpobrotus edulis</i>	Ice plant, largeleaf (see label)	F
<i>Clytostoma callistegioides</i>	Trumpet vine, violet	C,F
<i>Cortaderia selloana</i>	Pampas grass	F
<i>Delosperma alba</i>	White iceplant	F
<i>Drosanthemum floribundum</i>	Trailing rosea iceplant	F
<i>Festuca ovina glauca</i>	Blue fescue	F
<i>Gazania rigens leucolaena</i>	Gazania, trailing	F
<i>Gazania</i> spp.	Gazania	F
<i>Hedera canariensis</i>	Ivy, Algerian	F
<i>Hedera helix</i>	Ivy, English	F
<i>Hemerocallis</i> spp.	Daylily	C,F
<i>Hosta lancifolia</i>	Albo-marginata hosta	C,F
<i>Hosta</i> spp.	Lily, plantain	C,F
<i>Hypericum</i> spp.	St. Johnswort	C,F
<i>Lampranthus spectabilis</i>	Trailing iceplant	F
<i>Liriope gigantea</i>	White lily turf	F
<i>Liriope muscari</i>	Lilac beauty lily turf	C,F
	Majestic lily turf	C,F
	Monroe white lily turf	C,F
	Silvery sunproof lily turf	C,F
	Variegated liriope lily turf	C,F
	Big blue lily turf	C,F
<i>Lonicera japonica</i>	Honeysuckle, Japanese	F
<i>Mesembryanthemum crystallinum</i>	Ice plant (see label)	F
<i>Ophiopogon japonicus</i>	Mondo grass	F
<i>Osteospermum fruticosum</i>	Daisy, trailing African	F
<i>Pachysandra terminalis</i>	Japanese spurge	F
<i>Sedum brevifolium</i>	Stoncrop	F
<i>Vinca major</i>	Periwinkle, bigleaf	F
<i>Vinca minor</i>	Periwinkle, dwarf	F

**Flowers****Recommended Treatment Method****F = Field Grown****C = Container Grown****Scientific Name****Common Name**

<i>Achillea</i> spp.	Yarrow	F
<i>Antirrhinum majus</i>	Snapdragon	F
<i>Caladium bicolor</i>	Caladium, fancy leafed	F
<i>Chrysanthemum coccineum</i>	Daisy, painted	F
<i>Chrysanthemum maximum</i>	Daisy, Shasta	F
<i>Chrysanthemum morifolium</i>	Chrysanthemum	F
<i>Cladium bicolor</i>	Fancy-leafed caladium	F
<i>Coreopsis lanceolata</i>	Coreopsis	F
<i>Dianthus barbatus</i>	Sweet William	F

<i>Dicentra spectabilis</i>	Bleeding heart	C,F
<i>Dimorphotheca</i> spp.	Marigold, cape	F
<i>Echinacea purpurea</i>	Coneflower, purple	F
<i>Geum quellyon</i>	Geum	F
<i>Gladiolus hortulanus</i>	Gladiolus	F
<i>Gypsophila paniculata</i>	Baby's breath	F
<i>Impatiens wallerana</i>	Impatiens (Busy lizzie)	F
<i>Iris</i> spp.	<i>Iris, bearded</i>	F
<i>Liatris spicata</i>	Blazing star	C,F
<i>Peperomia horticola</i>	Geranium	F
<i>Petunia</i> spp.	Petunia	F
<i>Portulaca grandiflora</i>	Moss, rose	F
<i>Ranunculus asiaticus</i>	Ranunculus, Persian	F
<i>Rosa</i> spp.	Rose	F
<i>Rudbeckia hirta</i>	Daisy, gloriosa (black-eyed Susan)	F
<i>Salvia</i> spp.	Salvia (Sage)	F
<i>Stokesia laevis</i>	Aster, stokes	F
<i>Strelitzia reginae</i>	Bird of paradise	F
<i>Tagetes</i> spp.	Marigold	F
<i>Viola wittrockiana</i>	Pansy	F
<i>Zinnia elegans</i>	Zinnia, common	F

**Non-bearing Trees and Vines****Recommended Treatment Method**

F = Field Grown

C = Container Grown

almond	F
apple	F
apricot	F
avocado	F
blackberry	F
blueberry	F
boysenberry	F
cherry, sour	F
cherry, sweet	F
currant	F
dewberry	F
elderberry	F
fig	F
filbert	F
gooseberry	F
grape, American	F
grape, European	F
grapefruit	F
kiwi	F
Kumquat	C,F
lemon	F
loganberry	F
macadamia nut	F
nectarine	F
olive	F
orange	C,F
peach	F

27/34

pear	F
pecan	C,F
pistachio	F
plum	F
pomegranate	F
prune	F
raspberry	F
walnut, black	F
walnut, English	F

\*Non-bearing plants are defined as those which will not bear fruit for at least one year after treatment.

## Ornamental Bulbs

Surflan A.S. may be applied for control of susceptible annual weeds in ornamental bulbs, e.g., bulbous iris, daffodil (narcissus), hyacinth, and tulip. Apply Surflan A.S. to the soil surface 2-4 weeks after planting, but prior to the emergence of annual weeds. For fall planted bulbs, apply Surflan A.S. again in late winter or early spring to weed-free soil surfaces.

### Broadcast Application Rates

Time of Application	Soil Texture	Surflan A.S.		Minimum Time Between Applications (months)	Total Amount Allowed Per Year (qt/acre)
		(qt/acre)	(fl oz/1000 sq ft)		
Fall	Coarse	0.75	0.5	3	1.5
Fall	Medium and Fine	1.5	1.0	3	2.25
Feb. - March	All Soil Textures	0.75	0.5	3	2.25

### Special Use Precautions:

Do not apply to tulip plants that have emerged to a height greater than 3/4 inch.  
Do not apply to gladioli corms prior to emergence or less than one (1) inch in diameter.

## Shadehouse Areas

Surflan A.S. may be applied to drainage areas under benches in open shadehouse-type structures where the natural flow of air is unimpeded. Do not apply in enclosed greenhouses or in enclosed shadehouse-type structures. Do not apply within 3 weeks prior to enclosure of greenhouse or poly-type structures.

## 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 tank mix product labels for specific use directions, precautions, and limitations before use.

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

**Special Use Precautions:**

Do not apply to Douglas-fir (*Pseudotsuga menziesii*). Do not apply to seedbeds or seedling transplant beds. Apply only to established plants 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.

**Noncropland Areas and Industrial Sites****Noncropland Areas - Tank Mix Combinations**

Tank mix combinations of Surflan A.S. plus Roundup and many other labeled herbicides may be used to control undesirable vegetation in noncropland areas such as roadsides, rights-of-way, etc. When applied according to use directions, these tank mixes will provide control of susceptible weed species listed on the respective product labels. Refer to tank mix product labels for specific use directions, precautions, and limitations before use.

**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	6
4 - 8 months	4	3	4	12
8 - 12 months	6	4.5	8	12

**Industrial Sites - Tank Mix Combinations**

Tank mix combinations of Surflan A.S. plus Roundup, Spike\* herbicide, and many other labeled herbicides may be used as overtop sprays to control existing vegetation on industrial sites such as utility substations, highway guard rails, sign posts, and delineators. When applied according to use directions, these tank mixes will provide control of susceptible weed species listed on the respective product labels. Refer to tank mix product labels for specific use directions, precautions, and limitation before use.

## Warm Season Turfgrasses

Surflan A.S. may be applied as a preemergence treatment for control of annual grasses and certain broadleaf weeds in established warm season turf including bahiagrass, bermudagrass, buffalograss, centipedegrass, St. Augustinegrass, zoysiagrass, and established tall fescue growing in warm season areas. Established turf is defined as a dense turf having a well-anchored root system and healthy, vigorous top growth. Use Surflan A.S. only as a part of a total turf management program that includes good fertilization practices.

Surflan A.S. may be tank mixed with Gallery\* herbicide (California registration pending) and applied preemergence to broaden the spectrum of broadleaf weed control in warm season turf. Refer to the label for Gallery for specific use directions, precautions, and limitations before use.

Any cultural practices that disturb the soil, such as aerification or verticutting, should be done prior to application of Surflan A.S.

Surflan A.S. will not control emerged weeds. Successful preemergence control of weeds listed on this label requires that Surflan A.S. be applied prior to weed germination and be activated by at least one-half (1/2) inch of rainfall or irrigation within 21 days of application.

Surflan A.S. may injure turf that is not well-established or is stressed or weakened due to unfavorable winter climatic conditions, drought, nematodes, or other factors which damage or weaken turf root systems. Apply Surflan A.S. only to healthy, well-established turf that has a well-anchored root system.

Do not apply Surflan A.S. in the spring or early summer to tall fescue turfgrass reseeded the previous fall. In such cases, apply Balan\* 2.5G granular herbicide at 60-80 pounds per acre in early summer (Round 1) and Surflan A.S. at 1.5 quarts per acre approximately eight weeks later (Round 2). Do not apply Surflan A.S. at the single application rate (2 quarts per acre) to established tall fescue; in such cases, apply 1.5 quarts per acre of Surflan A.S. in an initial application, followed by a second application of 1.5 quarts per acre 8-10 weeks later.

In bermudagrass areas that have been overseeded with winter grasses, a spring application of Surflan A.S. will thin the overseeded grasses.

### Annual Grasses Controlled by Surflan A.S.

#### Summer Annuals:

Common Name	Scientific Name
barnyardgrass (watergrass)	<i>Echinochloa crus-galli</i>
crabgrass, large	<i>Digitaria sanguinalis</i>
crabgrass, smooth	<i>Digitaria ischaemum</i>
crabgrass	<i>Digitaria spp.</i>
crowfootgrass	<i>Dactyloctenium aegyptium</i>
foxtail, bristleglass	<i>Setaria magna</i>
foxtail, giant	<i>Setaria faberi</i>
foxtail, green (pigeongrass)	<i>Setaria viridis</i>
foxtail, robust	<i>Setaria robusta</i>
foxtail, yellow	<i>Setaria glauca</i>
goosegrass (silver crabgrass)	<i>Eleusine indica</i>
Johnsongrass (seedling only)	<i>Sorghum halepense</i>

ryegrass, Italian *Lolium multiflorum*  
 sandbur, field *Cenchrus incertus*

**Winter Annuals:**

**Common Name** **Scientific Name**  
 bluegrass, annual *Poa annua*

**Annual Broadleaf Weeds Controlled by Surflan A.S.****Summer Annuals:**

**Common Name** **Scientific Name**  
 carpetweed *Mollugo verticillata*  
 knotweed, prostrate *Polygonum aviculare*  
 purslane, common *Portulaca oleracea*

**Winter Annuals:**

**Common Name** **Scientific Name**  
 chickweed, common *Stellaria media*  
 henbit *Lamium amplexicaule*

**Broadleaf Weeds Suppressed by Surflan A.S.**

**Common Name** **Scientific Name**  
 groundsel, common *Senecio vulgaris*  
 spurge, prostrate *Euphorbia humistrata*  
 woodsorrel, yellow *Oxalis stricta*

**Application Rates, Frequency, and Timing of Application**

Surflan A.S. can be applied in the spring for summer annual grass and broadleaf weed control, and in the fall for annual bluegrass (*Poa annua*) and winter annual broadleaf weed control.

**Broadcast Application Rates (Warm Season Turfgrasses)**

<u>Use Area</u>	<u>Surflan A.S.</u>		<u>Minimum Time</u> <u>Between</u> <u>Applications</u>	<u>Total Amount</u> <u>Allowed Per</u> <u>Year</u>
	<u>(qt/acre)</u>	<u>(fl oz/1000 sq ft)</u>	<u>(months)</u>	<u>(qt/acre)</u>
<u>All, except</u>	1.5	1	<u>3</u>	<u>6</u>
<u>Florida</u>	2	1.5	<u>3</u>	<u>6</u>
<u>Florida</u>	1.5	1	<u>3</u>	<u>4.5</u>

**1. Summer Annual Grasses and Broadleaf Weeds**

**Single Application Program:** Apply 2 quarts per acre of Surflan A.S. in late winter or early spring, prior to the onset of conditions favorable for annual weed germination.

**Split Application Program:** As an alternative to a single application program, Surflan A.S. may be applied in a split application. This program is desirable when the initial application is made well in advance of weed germination and where weed control is desired for a longer period of time. Apply 1.5 quarts per acre of Surflan A.S. in an initial application, followed by a second application of 1.5 quarts per acre 8-10 weeks later.

The second treatment of the split application may follow application of a different preemergence grass herbicide in place of the initial application of Surflan A.S.



## 2. Annual Bluegrass (*Poa annua*) and Winter Annual Broadleaf Weeds

In areas of heavy annual bluegrass infestation, its elimination will result in temporary thinning of turfgrass cover. Proper fertilization, irrigation, and soil incorporated reseeding should be employed to speed the restoration of desirable turfgrass cover in areas previously occupied by annual bluegrass (see section on reseeding).

Apply Surflan A.S. as a preemergence treatment in late summer or early fall, prior to the expected germination period for annual bluegrass and winter annual broadleaf weeds. If annual bluegrass infestation is severe and its elimination will result in thinning of turfgrass cover, apply Surflan A.S. at 1.5 quarts per acre. If thinning of turfgrass cover is not a potential problem, Surflan A.S. may be applied at 2 quarts per acre.

### Broadcast Application Rates

Surflan A.S.	
quarts/acre	fl oz/1000 sq ft
1.5	4
2	4.5

### Weed Control in Florida

In Florida, apply 1.5 quarts per acre of Surflan A.S. three times per year, or every 90-100 days, in the fall, early spring, and early summer. Do not apply more than 1.5 quarts per acre of Surflan A.S. in any single application.

### Application Equipment

Apply Surflan A.S. evenly over the turfgrass area. Avoid spray pattern skips and overlaps that may result in incomplete coverage or over-application. For best results, use application equipment designed to uniformly broadcast liquid herbicides. Calibrate application equipment prior to use, according to manufacturer's directions. Check equipment frequently to make sure it is working properly and distributing spray uniformly.

### Reseeding

Herbicides that control annual weeds may also affect establishment of desirable turfgrass seedlings. Reseeding should be delayed for at least 90-120 days following application of Surflan A.S.. When reseeding, it is essential that proper cultural practices such as soil cultivation and seedbed preparation, irrigation, and fertilization be followed. For satisfactory reseeding results following use of Surflan A.S., the seeding rate should be increased and equipment designed to place seed in full contact with soil (such as the Rogers Aero Seeder) should be employed.

### Special Use Precautions:

To avoid possible injury, do not apply Surflan A.S. to:

- o Cool season turfgrass species.
- o Golf course putting greens and tees or lawns containing dichondra or cool season turfgrass species.
- o Newly sprigged or sodded areas of bermudagrass, St. Augustinegrass, centipedegrass, or zoysiagrass until these turfgrasses are well-established and have well-anchored root systems.
- o Newly hydromulched areas of bermudagrass until such areas are well-established.
- o Bermudagrass variety "Sun Turf" when tank mixed with atrazine.

---

### Warranty Disclaimer

Dow AgroSciences warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. Dow AgroSciences MAKES NO OTHER EXPRESS OR

IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

---

**Inherent Risks of Use**

---

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperature, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of Dow AgroSciences or the seller. All such risks shall be assumed by buyer.

---

**Limitation of Remedies**

---

The exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories), shall be limited to, at Dow AgroSciences' election, one of the following:

1. Refund of purchase price paid by buyer or user for product bought, or
2. Replacement of amount of product used

Dow AgroSciences shall not be liable for losses or damages resulting from handling or use of this product unless Dow AgroSciences is promptly notified of such loss or damage in writing. In no case shall Dow AgroSciences be liable for consequential or incidental damages or losses.

The terms of the "Warranty Disclaimer" above and this "Limitation of Remedies" cannot be varied by any written or verbal statements or agreements. No employee or sales agent of Dow AgroSciences or the seller is authorized to vary or exceed the terms of the "Warranty Disclaimer" or this "Limitation of Remedies" in any manner.

\*Trademark of Dow AgroSciences LLC  
EPA-Accepted   /  /