



# SURFLAN<sup>\*</sup> A.S. PRE-EMERGENT HERBICIDE

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

- Landscape ornamentals
- Container grown ornamentals
- Field grown ornamentals
  - Drainage areas under shadehouse benches
  - Ornamental bulbs
- Ground covers
  - Christmas tree plantations
- Noncropland and Industrial sites
- Non-bearing fruit and nut trees and non-bearing vineyards
- Established warm season turf (including Bahiagrass, Bermudagrass, Buffalograss, Centipedegrass, St. Augustine grass, and Zoysiagrass) ◦ Tall Fescue (warm season areas)

**Active Ingredient:**

oryzalin: 3,5-dinitro-*N,N*-dipropylsulfanilamide ..... 40.4%

**Inert Ingredients** ..... 59.6%

**Total** ..... 100.0%

Contains 4.0 pounds of active ingredient per gallon.

## CAUTION

### Keep Out of Reach of Children

**PRECAUTION:** 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.)

EPA Reg. No. 62719-113-829

EPA Est. No. 829-FL-1

**Broadcast Application Rates for listed Ornamentals:**

Length of Control	Surflan A.S. quarts/acre	fl oz/1000 sq ft*
2 to 4 months	2	1.5
4 to 8 months	4	3

\*in appropriate amount of water to cover area.

**SHAKE WELL BEFORE USING.**

**Precautionary Statements**

**Hazards to Humans and Domestic Animals**

**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.

**First Aid**

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

**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**

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 or rinsate. Cover or incorporate spills.

**Notice:** Read the entire label. Use only according to label. In case of emergency endangering health or the environment involving this product, call collect 517-636-4400. Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

Avoid contact with skin, eyes or clothing. Avoid breathing spray mist. Surflan A.S. may cause skin sensitization reactions in certain individuals.

**Personal Protective Equipment (PPE) Applicators and other handlers must wear:**

- \* Long-sleeved shirt and long pants
- \* Waterproof gloves
- \* Shoes plus socks
- \* Protective eyewear

Follow manufacturers'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.

**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.

## 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 the handlers of agricultural pesticides. It contains requirements for training, decontamination notification, and emergency assistance. It also contains specific instructions and exemptions 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 12 hours. 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 \* Waterproof gloves \* Shoes plus socks \* Protective eyewear.

**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 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 annual grasses and many broadleaf weeds in ornamental plantings, bulbs, ground covers/perennials, established warm-season turfgrass, Christmas tree plantations, non-bearing trees and vines, and non-cropland 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 to 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.

#### **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 till 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 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, 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.

**Handheld 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 1,000 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 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./1,000 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 to 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 Surflan A.S. tank mixes. 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 to 2 inches deep to destroy existing weeds or remove them by hand. Shallow cultivation to a depth of 1 to 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:

<u>Common Name</u>	<u>Scientific Name</u>
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>
jungerice	<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 (spreading panicgrass)	<i>Panicum dichotomiflorum</i>
panicum, Texas (buffalograss) (Coloradograss)	<i>Panicum texanum</i>
ryegrass, Italian	<i>Lolium multiflorum</i>
sandbur, field	<i>Cenchrus incertus</i>
signalgrass (Brachiaria)	<i>Brachiaria</i> spp.
sprangletop, red	<i>Leptochloa filiformis</i>
witchgrass	<i>Panicum capillare</i>

### Broadleaf Weeds:

<u>Common Name</u>	<u>Scientific Name</u>
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>
lambquarters	<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) (Mexican clover) (pusley)	<i>Richardia scabra</i>
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:

<u>Common Name</u>	<u>Scientific Name</u>
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 pennsylvanicum</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 and shrubs; ground covers/perennials, flowers, non-bearing fruit and nut trees, nonbearing vineyards; and in the production of ornamental bulbs (See "Ornamental Bulbs" for special use directions).

### Broadcast Application Rates

Length of Control	Surflan A.S.	
	quarts/acre	fl oz/1000 sq ft
2 to 4 months	2	1.5
4 to 8 months	4	3

### Tank Mix Combinations

Tank mix combinations of Surflan A.S. plus Roundup, and many other laveled 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: \*Nursery, forest, or Christmas tree; seedling beds, cutting beds, or transplant beds.

- ° Unrooted liners or cuttings that have been planted in pots for the first time.
- ° Pots less than four inches wide.
- ° Ground covers until they are established and well rooted.
- ° Ornamental plantings where there is likelihood of runoff onto lawn areas.
- ° 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 application 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

Scientific Name	Recommended Treatment Method	
	F = Field Grown	C = Container Grown
Abies balsamea	Fir, balsam	F
Abies concolor	Fir, white	F
Abies fraseri	Fir, fraser	F
Abies grandis	Fir, grand	F
Abies veitchii	Fir, Vietch	F
Abies lasiocarpa	Fir, alpine	F
Abutilon hybridum	Albus-flowering maple	F
	Luteus-flowering maple	F
	Roseus-flowering maple	F
	Tangerine-flowering maple	F
	Vesuvius red-flowering maple	F
Acer ginnala	Flame maple	F
Acer rubrum	Red sunset maple	F
Acer saccharinum	Silver maple	F
Acer spp.	Maple	F
Arecastrum romanzoffianum	Queen palm	F
Betula nigra	Birch, river	F
Betula papyrifera	Paper birch	F
Betula pendula	Birch, white	F
Bucida buceras	Black olive	F
Carya spp.	Pecan, ornamental	C,F
Ceratonia siliqua	Carob	F
Cercidium floridum	Palo Verde, blue	F
Cercis canadensis	Redbud	C,F
Chamaecyparis lawsoniana	Falsecypress, Lawson	F
Chamaecyparis obtusa	Filicoides-fernspray cypress	F
	Gracilis-slender Hinoki cypress	F
Chamaecyparis pisifera	Sawara-false cypress	F
	Squarrosa-moss cypress	F
Chamaedorea cataractarum	Cat Palm	F
Chamaedorea costaricana	Palm	F
Chamaedorea elegans	Parlor palm	F
Citrus spp.	Citrus, ornamental	C,F
Cornus florida	Dogwood, flowering	F
Cryptomeria japonica	Cryptomeria, Japanese	C,F
Cupaniopsis anacardioides	Carrot wood	F
Cupressus arizonica (glabra)	Cypress, Arizona	C,F
Cupressus glabra	Arizona cypress	C,F
Cupressus sempervirens	Cypress, Italian	C,F
Elaeagnus angustifolia	Russian olive	C,F
Eucalyptus camaldulensis	Red gum eucalyptus	F
Eucalyptus cinerea	Eucalyptus, mealy	F
	Silver dollar eucalyptus	F
Eucalyptus nicholii	Eucalyptus, narrow-leaved	F
Eucalyptus sideroxylo	Eucalyptus, red ironbark	F
Ficus benjamina	Ficus	F
Fraxinus spp.	Ash	F
Ginkgo biloba	Ginkgo (Maidenhair tree)	C,F
Gleditsia triacanthos	Honey locust	F
Heteromeles arbutiflora	Toyon	F
Juniperus virginiana	Redcedar, Eastern	F
Koeleruteria paniculata	Goldenrain tree	F
Liquidambar styraciflua	Sweetgum, American	C,F
Magnolia grandiflora	Magnolia, Southern	F
Malus spp.	Crabapple	F
Morus alba	White mulberry	F

Picea abies	Pendula-weeping Norway spruce	F
	Repens-spreading Norway spruce	F
	Spruce, Norway	F
Picea englemanni	Spruce, Englemann	F
Picea glauca	Spruce, white	F
	Conica-dwarf Alberta spruce	F
	Dwarf Alberta spruce	F
Picea glauca conica	Spruce, black	F
Picea mariana	Glauca-Colorado blue spruce	F
Picea pungens	Hoopsii-Hoop's blue spruce	F
	Koster-Koster blue spruce	F
	Spruce, Colorado	C,F
Pinus aristata	Bristlecone pine	F
Pinus canariensis	Canary Island pine	F
Pinus contorta	Shore pine, beach pine	F
Pinus eldarica	Eldarica pine	F
Pinus radiata	Monterey pine	F
Pinus spp.	Pine	C,F
Pinus strobus	Eastern white pine	F
Pinus sylvestris	Scotch pine	F
Pinus thunbergiana	Japanese black pine	F
Platanus occidentalis	American sycamore	F
Platanus racemosa	Californina sycamore	F
Podocarpus spp.	Podocarpus	F
Populus deltoides	Cottonwood	F
	Cottonwood (grown for pulp)	F
Prunus caroliniana	Laurelcherry, Carolina	F
Prunus laurocerasus	Laurelcherry, English	F
Prunus mahaleb	Cherry, Mahaleb	F
Prunus yedoensis	Yoshino flowering cherry	F
Pyrus communis	Pear	F
Quercus palustris	Pin oak	F
Quercus phellos	Willow oak	F
Quercus rubra	Red oak	C,F
Quercus spp.	Oak	C,F
Salix babylonica	Babylon weeping willow	F
	Corkscrew willow	F
Schinus molle	California pepper tree	F
Sequoia sempervirens	Redwood, coast	F
Sequoiadendron giganteum	Giant sequoia	F
Swietenia mahogany	Mahogany	F
Tabebuia caraiba	Yellow tab	F
Tilia cordata	Linden, little leaf	C,F
Ulmus parvifolia	Chinese elm	F
Umbellularia californica	California laurel	F
Washingtonia robusta	Mexican fan palm	F

### Shrubs

Scientific Name	Recommended Treatment Method	
	F = Field Grown	C = Container Grown
Abelia grandiflora	Common Name	F
Acacia redolens	Glossy abelia	F
Agave americana	Acacia, prostrate	F
Agave macrocarpum	Century plant	F
Arctostaphylos stanfordiana	Agave	F
Astilbe chinensis	Manzanita, Stanford	F
Baccharis pilularis	Astilbe/false spirea	C,F
Berberis thunbergii	Coyotebush	F
	Aurea-golden Japanese barberry	C,F
	Crimson pygmy barberry	C,F
Barberry, Japanese	Atropurea-redleaf Japanese barberry	C,F
Bougainvillea spp.	Barbara Karst	F
	California gold	F
	Scarlet O'Hara	F
	Texas dawn	F
Buxus microphylla	Littleleaf boxwood	F
Buxus microphylla japonica	Boxwood, Japanese	C,F
Buxus sempervirens	Boxwood, common	C,F
Callistemon citrinus	Bottlebrush, lemon	C,F
Cassia artemisioides	Cassia, feathery	F
Ceanothus americanus	Jerseytea, reedroot	C,F
Ceanothus spp.	Wild lilac	C,F
Chamaecyparis obtusa	Kosteri cypress	F
	Nana-dwarf Hinoki cypress	F
	Torulosa cypress	F
Chamaecyparis pisifera	Squarrosa Minima cypress	F
Chamaecyparis pisifera spp.	Filifera-thread cypress	F
Chrysalidocarpus lutescens	Arca palm	F
Cleyera japonica	Cleyera, Japanese	C,F
Cornus alba	Sibirica-Siberian dogwood	F
Cornus kousa	Dogwood, kousa	C,F
Cornus stolonifera	Flaviramea-yellowtwig dogwood	F
Cotoneaster adpressus	Praecox-early cotoneaster	F
Cotoneaster apiculatus	Cotoneaster, cranberry	C,F
Cotoneaster buxifolius	Cotoneaster, brightbead	F
Cotoneaster congestus	Cotoneaster, Pyrenees	F
Cotoneaster dammeri	Cotoneaster, bearberry	C,F
Cotoneaster himalayan	Himalayan cotoneaster	F
Cotoneaster horizontalis	Cotoneaster, rock	C,F
Cotoneaster lacteus	Cotoneaster, parney	C,F
Cotoneaster microphyllus	Cotoneaster, rockspray	F
Cytisus praecox	Hollandia-warmminster broom	F
Cytisus scoparius	Lena-Scotch broom	F
Dasyliiron wheeleri	Sotol, desert spoon	F
Deutzia crenata	Nakiana-dwarf deutzia	F
Dodonaea viscosa	Hopseedbush, clammy	F
	Hopseed bush	F
Escallonia exoniensis	Escallonia	C,F
Euonymus alata	Euonymus, winged	F
Euonymus fortunei	Canadale gold euonymus	C,F
	Emerald n gold euonymus	C,F
	Euonymus, stringybark	C,F
	Euonymus, evergreen	C,F
Euonymus japonica	Euonymus, evergreen	C,F
	Silver king euonymus	F
Euonymus kiatschovica	Spreading euonymus	F
Fatschedera lizei	Fatschedera	C,F
Forsythia intermedia	Forsythia, border	F
Gardenia jasminoides	Gardenia	C,F



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

#### 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 inch in diameter.

### Broadcast Application Rates

Time of Application	Soil Texture	quarts /acre	fl.oz./ 1000 sq. ft.
Fall	Coarse	0.75	0.5
Fall	Med. & Fine	1.5	1.0
Feb.-March	All Soils	0.75	0.5

### Greenhouse Areas

Surflan A.S. may be applied to drainage areas under benches in open greenhouse-type structures. Do not apply in enclosed greenhouses or in enclosed shadehouse-type structures. Do not apply within three weeks prior to enclosure in greenhouse-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.). Do not apply to Douglas-fir (*Pseudotsuga menziesii*). Do not apply to seedbeds or seedling transplant beds. Apply only to established plantings. Established plants 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. Follow all instructions provided in the "General Information" section of this label.

### Broadcast Application Rates

Length of Control	Surflan A.S.	
	quarts/acre	fl oz/1000 sq ft
2 to 4 months	2	1.5
4 to 8 months	4	3

#### 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 Roundup label and residual preemergence control of susceptible weed species listed on the Surflan A.S. label. Refer to the Roundup label for specific use directions, precautions and limitations before use.

#### Precautions:

Do not apply sprays containing Roundup over the top of Christmas tree plantings.

Extreme care must be exercised to avoid contact of spray containing Roundup with foliage and stems of Christmas trees or severe damage or death may result.

### 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. 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.

Length of Control	Surflan A.S.	
	quarts/acre	fl oz/1000 sq ft
2 to 4 months	2	1.5
4 to 8 months	4	3
8 to 12 months	6	4.5

#### Industrial Sites -- Tank Mix Combinations

Tank mix combinations of Surflan A.S. plus Roundup, Spike 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 and zoysiagrass or 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. 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 Gallery label for specific use directions, precautions, and limitations before use.

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.

### Special Use Precautions:

- To avoid possible injury, do not apply Surflan A.S. to:
- ° Cool season turfgrass species.
  - ° Golf course putting greens or tees or lawns containing dichondra or cool season turfgrass species.
  - ° Newly sprigged or sodded areas of bermudagrass, St. Augustinegrass, centipedegrass, or zoysiagrass until these turfs are well-established and have well-anchored root systems.
  - ° Newly hydromulched areas of bermudagrass until such areas are well-established.
  - ° Bermudagrass variety "Sun Turf" when tank mixed with atrazine.

Surflan A.S. will not control emerged weeds. 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. 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. Use Surflan A.S. only as a part of a total turf management program that includes good fertilization practices.

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 to 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 to 10 weeks later.

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

## Annual Grasses Controlled by Surflan A.S.

### Summer Annuals:

<u>Common Name</u>	<u>Scientific Name</u>
bartyardgrass (watergrass)	<i>Echinochloa crus-galli</i>
crabgrass, large	<i>Digitaria sanguinalis</i>
crabgrass, smooth	<i>Digitaria ischaemum</i>
crabgrass	<i>Digitaria</i> spp.
crowfootgrass	<i>Dactyloctenium aegyptium</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>
ryegrass, Italian	<i>Lolium multiflorum</i>
sandbur, field	<i>Cenchrus incertus</i>

### Winter Annuals:

<u>Common Name</u>	<u>Scientific Name</u>
bluegrass, annual	<i>Poa annua</i>

## Annual Broadleaf Weeds Controlled by Surflan

### Summer Annuals:

<u>Common Name</u>	<u>Scientific Name</u>
carpetweed	<i>Mollugo verticillata</i>
knotweed, prostrate	<i>Polygonum aviculare</i>
purslane, common	<i>Portulaca oleracea</i>

### Winter Annuals:

<u>Common Name</u>	<u>Scientific Name</u>
chickweed, common	<i>Stellaria media</i>
henbit	<i>Lamium amplexicaule</i>

## Broadleaf Weeds Suppressed by Surflan A.S.

<u>Common Name</u>	<u>Scientific Name</u>
groundsel, common	<i>Senecio vulgaris</i>
spurge, prostrate	<i>Euphorbia humistrata</i>
woodsorrel, yellow	<i>Oxalis stricta</i>

### 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.

### 1. Summer Annual Grasses and Broadleaf Weeds

**Single Application Program:** Apply 2 quarts per acre of Surflan A.S. per acre 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 to 10 weeks later.

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

### 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 reseeded 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

<u>Surflan A.S.</u>	
quarts/acre	fl. oz./1000 sq. ft.
1.5	1
2	1.5

### Weed Control in Florida

In Florida, apply 1.5 quarts per acre of Surflan A.S. three times per year, or every 90 to 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 Surflan A.S. use, 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.

### Warranty Disclaimer

DowElanco 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. DOWELANCO 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 DowElanco 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 DowElanco's 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.

DowElanco shall not be liable for losses or damages resulting from handling or use of this product unless DowElanco is promptly notified of such loss or damage in writing. In no case shall DowElanco 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 DowElanco or the seller is authorized to vary or exceed the terms of the "Warranty Disclaimer" or this "Limitation of Remedies" in any manner.

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revised 1998