

2217-759

05/08/2003

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

OFFICE OF  
PREVENTION, PESTICIDES AND  
TOXIC SUBSTANCES

Craig Martens  
Manager of Regulatory Services  
PBI/Gordon Corporation  
P.O. Box 014090  
Kansas City, MO 64101

MAY - 8 2003

Subject: Embark® 2-S Plant Growth Regulator  
EPA Reg No. 2217-759  
Your amended label dated February 28, 2003

Dear Mr. Martens:

The label referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide and Rodenticide Act as amended is acceptable provided the following changes are made:

1. In the List of Ingredients section, change "INERT INGREDIENTS" to "OTHER INGREDIENTS"
2. In the section Hazards to Humans and Domestic Animals, add language warning that the product causes eye irritation and is harmful if inhaled.
3. In the First Aid box, change the order as follows:  
If in eyes:  
If inhaled:  
If swallowed:  
If on skin or clothing:
4. In the Storage and Disposal section:

Change the subheading "STORAGE" to "PESTICIDE STORAGE"

In the section "CONTAINER DISPOSAL", add the word "by" to the phrase "...in a sanitary landfill, or (by) incineration, or...."

Embark® 2-S Plant Growth Regulator  
Page 2

5. In Option 2, Storage and Disposal section:

Change the subheading "STORAGE" to "PESTICIDE STORAGE"

In the section "CONTAINER DISPOSAL", add the word "by" to the phrase "...in a sanitary landfill, or (by) incineration, or...."

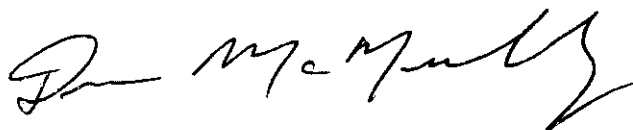
6. In Option 2, Spray Preparation for Embark..., item 3, in the second sentence change the word "of" to "for" or "with"

One copy of the label stamped "Accepted with comments" is enclosed for your information.

Please submit one copy of the final printed label before the product is released for shipment.

If you have any questions, please contact Robert Westin by phone at (703) 305-5721 or via email at [westin.robert@epa.gov](mailto:westin.robert@epa.gov).

Sincerely,



Dennis McNeilly  
Acting Product Manager (22)  
Fungicide Branch  
Registration Division (7505C)

enclosure

# EMBARK<sup>®</sup> 2-S PLANT GROWTH REGULATOR

**Reduces Frequency of Mowing and Trimming  
of Certain Grasses and Ornamentals**

**ACTIVE INGREDIENT:**

\*\*Diethanolamine salt of mefluidide\*(N-[2,4-dimethyl-5-  
[[[(trifluoromethyl)-sulfonyl]amino]phenyl]acetamide) ..... 28.0%

INERT INGREDIENTS: ..... 72.0%

**TOTAL** 100.00%

\*U.S. Patent Nos. 3,639,474; 3,894,078; 4,013,444.

\*\*Equivalent to 2.0 lbs. (21% by weight) (N-[2,4-dimethyl-5-[[[(trifluoromethyl)sulfonyl]amino]phenyl]acetamide) per gallon.

**ACCEPTED  
with COMMENTS  
In EPA Letter Dated:  
MAY 8 2003**

**KEEP OUT OF REACH OF CHILDREN**

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

**CAUTION**

See other panels for additional Precautionary Statements and First Aid.

*changed from "Statement  
of Product  
Characteristics  
Statement"*

**NET CONTENTS: (1, 2.5, 5, 15, 30, and 55) GALLONS**

686/ AP..... *changed from "CG 2495"*

EPA REG. NO. 2217-759

EPA EST. NO. 2217-KS-2

MANUFACTURED BY:

**Gordon Corporation**

*An Employee-Owned Company*  
1217 West 12th Street  
Kansas City, Missouri 64101

Telephone: 1-800-821-7925

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**READ THE ENTIRE LABEL FIRST. OBSERVE ALL PRECAUTIONS AND FOLLOW DIRECTIONS CAREFULLY.**

### PRECAUTIONARY STATEMENTS

#### Hazards to Humans & Domestic Animals

**CAUTION:** Harmful if swallowed or absorbed through the skin. Avoid breathing spray mist. Avoid contact with skin, eyes or clothing. Wear protective clothing including rubber gloves when handling.

changed From "STATEMENT OF PRACTICAL TREATMENT"

Per  
PRN  
2001-1

#### First Aid

If in eyes:	<ul style="list-style-type: none"><li>• Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li><li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li><li>• Call a poison control center or doctor for treatment advice.</li></ul>
If on skin or clothing:	<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 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 do so by a poison control center or doctor.</li><li>• Do not give anything by mouth to an unconscious person.</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 treatment advice.</li></ul>
Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact 1-877-800-5556 for emergency medical treatment advice.	

Per  
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### ENVIRONMENTAL HAZARDS:

Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwater. Do not allow spray to drift onto nontarget crops or vegetation.

"s" deleted

### OPTION 1

#### DIRECTIONS FOR USE

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

Not for use on turf being grown for sale or other commercial use as sod, or for commercial seed production, or for research purposes.

#### STORAGE AND DISPOSAL

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

**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.

Embark® 2-S Plant Growth Regulator (PGR) may be applied to various species of turfgrass, ground covers, ornamental shrubs and trees in public, commercial, or industrial areas for reducing the frequency of mowing and trimming.

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

**SPRAY EQUIPMENT:**

The following spray equipment is recommended for:

**Ornamentals and Groundcovers:** Use a power sprayer equipped with hand-held spray gun or vehicular-mounted equipment that will deliver sufficient spray to penetrate dense foliage and provide thorough coverage of all parts of shrubs or plants.

**Turfgrasses and Low Maintenance Grasses:** Use conventional power spray equipment fitted with a spray boom, off-center nozzles, or handgun. Hand-pump sprayers are suitable for edging or spot treatments.

**MIXING:**

Pour the required amount of Embark® 2-S PGR into the spray tank containing approximately one-half the required amount of water. Fill the tank as required with water and spray as recommended. Minimal agitation in the spray tank is necessary.

**CALIBRATION:**

It is essential that spray equipment is properly adjusted and calibrated to assure proper dosage and uniform spray coverage. Follow the spray equipment manufacturer's directions for cleaning, adjusting pressure and selecting appropriate nozzles.

**RINSING:**

Triple rinse the Embark® 2-S PGR container with water and pour the rinse solution into the spray tank prior to spraying. Do not use spray equipment for other purposes until thoroughly cleaned. Flush spray equipment with plenty of water immediately after use to avoid contamination of later sprays.

**- TURFGRASS -****- RECOMMENDED APPLICATIONS -****RECOMMENDED USE AREAS:**

Embark® 2-S PGR may be applied to specified turfgrasses in commercial and public areas such as:

- ◆ **COMMERCIAL-INDUSTRIAL:** Highway rights-of-way, utility rights-of-way, buildings, industrial parks, tank farms, airports.
- ◆ **PUBLIC:** Schools, libraries, hospitals, cemeteries, golf courses, parks, roads, walkways, condominiums, and apartment complexes.
- ◆ **UNCULTIVATED AGRICULTURAL AREAS:** Around farm buildings, storage sheds, implement storage sheds, implement storage areas, and roadsides.

**MOWING:**

**When mowing after application:** For an evenly trimmed appearance grass may be mowed 3 to 7 days after Embark® 2-S PGR is applied.

**When mowing before application:** Grass may be mowed up to two days before applying Embark® 2-S PGR. Clippings and other debris should be removed before spraying. If mowing removes most of the green leaf tissue, spraying should be delayed until sufficient new growth develops to assure product absorption into green leaves.

**When mowing is not desired or practical:** Apply Embark® 2-S PGR in the spring, after green-up, but before mowing is necessary, thus avoiding mowing until growth regulation wears off.

**TANK MIXING WITH HERBICIDES:**

Embark® 2-S PGR may be tank mixed with one of the following herbicides to control broadleaf weeds:

HERBICIDE	MAXIMUM RATE
Trimec® Classic Broadleaf Herbicide	4 pints of product/acre
2,4-D low volatile ester and amine salt formulations	2 lbs. active ingredient/acre
MCPP in amine salt formulations	2 lbs. active ingredient/acre

## **ROADSIDE, LOW MAINTENANCE GRASSES AND UNCULTIVATED AGRICULTURAL AREAS:**

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Maximum benefits, including season long seedhead suppression of cool season grasses, can be attained by applying 2 pints/acre of Embark® 2-S PGR with surfactant after uniform grass green-up until approximately 2 weeks before seedhead appearance. Embark® 2-S PGR applications will give vegetative growth suppression for up to 8 weeks; however, a mowing will be necessary to eliminate escape seedheads which have not emerged. If temporary discoloration of turf occurs and is objectionable, reduce the 2 pint rate to 1½ pints/acre. For roadside and low maintenance turf in California, follow the recommended rates according to the California rate table.

### **SURFACTANTS:**

The use of a nonionic surfactant (except Calif.) is recommended to increase the extent and consistency of turfgrass regulation on roadside and low maintenance turf only. The recommended surfactant rate is 0.25 to 0.5% V/V (1 to 2 quarts/100 gallons of spray solution). Temporary, slight discoloration of turf may increase with the use of a surfactant.

### **LIMITATIONS ON TURFGRASS:**

Do not apply Embark® 2-S PGR to golf greens. Do not apply to turf areas within 4 growing months after seeding and do not reseed within 3 days following application (except Calif. where reseeding may not occur within 2 weeks). Turf treated with Embark® 2-S PGR may appear less dense and temporarily discolored when compared with untreated, actively growing turf. However, with increasing time, turf may appear darker green than untreated areas. Optimum results may not be obtained if rainfall or overhead irrigation occurs within 8 hours following application. Do not allow animals to graze on treated areas.

### **RECOMMENDATIONS:**

Embark® 2-S PGR, applied to turfgrass, reduces mowing requirements for 6 weeks following treatment by regulating growth and preventing seedhead formation. Apply Embark® 2-S PGR uniformly to green, actively growing turf. For season long seedhead suppression of cool season grasses, apply no later than when the seedhead can be felt at the base of the stem (approximately 2 weeks prior to seedhead appearance). Do not apply to closely mowed areas, where most of the green growth has been cut. Remove excessive grass clippings and leaves prior to treatment. Avoid spray overlaps that will increase dosage above those recommended. Embark® 2-S PGR may be applied more than once per season, however, wait at least 6 weeks between applications. In turfgrass renovation programs, areas treated with Embark® 2-S PGR may be reseeded 3 days following application (except Calif. where reseeding may not occur within 2 weeks).

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"PGR for Turfgrass" deleted

### APPLICATION RATE TABLE FOR TURFGRASS

Species	Recommended Rates of Embark® 2S <sup>1</sup>		Remarks
	Per Acre in 15-150 Gals./Water <sup>1</sup>	Fl. Oz. Per 1000 Sq.Ft. <sup>1</sup>	
Annual Bluegrass <sup>2</sup> ( <i>Poa annua</i> ) - (seedhead suppression only)	½ pint	⅓ fl.oz.	<b>For seedhead suppression only:</b> Apply after uniform green-up but before the first appearance of seedheads. Applications after first seedhead appearance will suppress seedheads which have not emerged.
Kentucky & Annual Bluegrass, Tall, Red & Chewing Fescues, Perennial Ryegrass, Timothy, Reed Canarygrass, Quackgrass, Kikuyugrass, Crested Wheatgrass <sup>2</sup> , Orchardgrass <sup>2</sup> , Smooth Bromegrass <sup>2</sup> , Centipedegrass	1½ pints	⅔ fl.oz.	For those grasses recommended at 1½ pint rate, a slightly longer period of growth regulation can be attained with a 2 pint/acre rate. If temporary discoloration of turf occurs and is objectionable reduce the 1½ pint rate to 1 pint/acre.
St. Augustinegrass	1 pint	⅔ fl.oz.	
Common Bermudagrass	4 pints	1½ fl.oz.	
<sup>1</sup> The amount of water used to give adequate and uniform spray coverage is dependent on the type of spray equipment used.			
<sup>2</sup> Except California.			

#### CALIFORNIA USE ONLY

Species	Recommended Rates of Embark® 2S		Remarks
	Per Acre in 15-150 Gals./Water <sup>1</sup>	Fl. Oz. Per 1000 Sq.Ft. <sup>1</sup>	
Kentucky & Annual Bluegrass, Tall, Red & Chewing Fescues, Perennial Ryegrass, Timothy, Reed Canarygrass, Quackgrass, Centipedegrass, Kikuyugrass	1½ pints	⅔ fl.oz.	For grasses recommended at the 1½ pint rate, reduce the rate to 1 pint/acre if temporary discoloration of turf occurs and is objectionable. In turfgrass renovation programs, areas treated with Embark® 2-S PGR may be reseeded 2 weeks following application.
St. Augustinegrass	1 pint	⅔ fl.oz.	
Common Bermudagrass	4 pints	1½ fl.oz.	
<b>Native Grasses &amp; Broadleaf Vegetation Grasses:</b> Wild Barley, Red Brome, Ripgut Brome, Wild Oats  <b>Broadleaves:</b> Cheeseweed, Sour Clover, Fiddleneck, Redstem Filaree, Black Mustard	2 pints	⅔ fl.oz.	For native grass and broadleaf vegetation, areas with high soil fertility may require up to 4 pints/acre.
<sup>1</sup> The amount of water used to give adequate and uniform spray coverage is dependent on the type of spray equipment used.			

## - ORNAMENTALS AND GROWDCOVERS -

### RECOMMENDED USE-AREAS:

Embark® 2-S PGR may be applied to specified ornamentals and groundcovers in commercial and public areas such as:

- **COMMERCIAL-INDUSTRIAL:** Highway rights-of-way, utility rights-of-way, buildings, industrial parks, tank farms, airports.
- **PUBLIC:** Schools, libraries, hospitals, cemeteries, golf courses, parks, roads, walkways, condominiums, office and apartment complexes.

### LIMITATIONS:

Avoid spray drift on nontarget foliage. Avoid drift on food crops. Do not wash foliage for at least 8 hours after application. If rain occurs within 8 hours, dilution of spray may occur. Do not apply to plants that are stressed, diseased, or otherwise unhealthy. Do not apply to plants grown in containers. Before using Embark® 2-S PGR on ornamentals, thoroughly clean spray tank to remove any broadleaf herbicide that may be present.

### RECOMMENDATIONS:

Embark® 2-S PGR applied as a full cover spray to specified ornamental shrubs, hedges, trees and groundcovers reduces trimming and pruning for up to 8 weeks.

### RECOMMENDED RATES OF EMBARK® 2-S PGR FOR ORNAMENTALS THROUGHOUT THE U.S. *changed from "Fluid"*

Species	Pints per 100 Gallons of Water	Fl. Oz. Per Gallon of Water	Remarks
<b>Groundcover:</b> African Daisy, Capeweed, Iceplant, English Ivy, Algerian Ivy <b>Shrubs and Trees:</b> Acacia, Bottlebrush, Brazilian Pepper Tree, Carob, Ficus, Hibiscus, Burford Holly, Japanese* Ligustrum, Melaleuca, Oleander, Photinia, Pittosporum, Podocarpus, Privet ( <i>Ligustrum sp.</i> ), Pyracantha, Raphiolepis, Viburnum, Xylosma	4 pints	$\frac{2}{3}$ fl.oz.	For growth regulation, apply Embark® 2-S PGR as a full cover spray with foliage penetration to the drip point. Applications should be made to healthy, actively growing plants 7 to 14 days after pruning or trimming. Once the plant resumes active growth, pruning and repeat applications may be made.
Ornamental Olive Trees	1 pint	$\frac{1}{6}$ fl.oz.	For fruit suppression of olive trees, apply Embark® 2-S PGR as a full cover spray at prebloom (tight bud stage) through the 5% bloom stage. See note.
*except California			

**NOTE:** Embark® 2-S PGR will reduce or eliminate undesirable fruit from olive trees. Two foliar applications are recommended during the prebloom or tight bud stage through the 5% bloom stage of the trees. Mix 1 pint of product per 100 gallons of water per application. The interval between the first and the second applications ( $\pm$  2 weeks) may vary between seasons and will be determined by the local environmental conditions. Full cover sprays are required, and all surfaces of the leaves and flower buds should be sprayed to the drip point. Flowers that have pollinated will set fruit. Spray volumes will depend on tree size. Generally, trees 20 to 30' in height may require 10 to 15 gallons of spray solution per tree.



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# **LIMITED WARRANTY AND DISCLAIMER.**

The manufacturer warrants only that the chemical composition of this product conforms to the ingredient statement given on the label, and that the product is reasonably suited for the labeled use when applied according to the Directions for Use.

THE MANUFACTURER NEITHER MAKES NOR INTENDS ANY OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE EXPRESSLY DISCLAIMED. This limited warranty does not extend to the use of the product inconsistent with label instructions, warnings or cautions, or to use of the product under abnormal conditions such as drought, excessive rainfall, tornadoes, hurricanes, etc. These factors are beyond the control of the manufacturer or the seller. Any damages arising from a breach of the manufacturer's warranty shall be limited to direct damages, and shall not include indirect or consequential damages such as loss of profits or values, except as otherwise provided by law.

The terms of this Limited Warranty and Disclaimer cannot be varied by any written or verbal statements or agreements. No employee or agent of the seller is authorized to vary or exceed the terms of this Limited Warranty and Disclaimer in any manner.

Embark<sup>®</sup> and Trimec<sup>®</sup> are registered trademarks of PBI/GORDON CORPORATION.

----- END OF OPTION I -----

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<b>OPTION 2</b>
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**Proposed Alternate Brand Name For This Option Only:** Embark

# EMBARK® 2-S IVM

## Plant Growth Regulator



### DIRECTIONS FOR USE

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

Not for use on turf being grown for sale or other commercial use as sod, or for commercial seed production, or for research purposes.

### STORAGE AND DISPOSAL

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

**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.

Embark® 2-S PGR can be incorporated into highway vegetation management programs to eliminate seedhead production and to reduce the mowing requirements. Embark® 2-S PGR may be applied to six species of established cool season grasses in noncropland sites. Embark® 2-S PGR may be useful in the following noncropland areas:

- ♦ **Highway rights-of-way:** (principal, interstate, state, and county highways), interchange ramps, waysides, service areas, and unpaved roads
- ♦ **Municipal, state, and federal lands such as:** airports, military installations, schools/universities, libraries, and hospitals
- ♦ **Commercial/Industrial areas including:** industrial parks, tank farms, plant sites, storage areas, fencerows, and utility rights-of-way.

Embark® 2-S PGR inhibits the growth of tall fescue, Kentucky bluegrass, perennial ryegrass, smooth brome grass, orchardgrass, and reed canarygrass. Mixed stands of these coarse textured species may respond unevenly to applications of Embark® 2-S PGR and the tank mixtures. All established perennial grasses should be at least one year old.

## - SPRAY EQUIPMENT AND MIXING INSTRUCTIONS -

### ***Spray Equipment:***

Use conventional power spray equipment with bypass or mechanical agitation and fitted with a spray boom, off-center nozzles, or a spray gun.

It is essential that spray equipment is properly adjusted and calibrated to assure proper dosage and uniform spray coverage. Follow the spray equipment manufacturer's directions for cleaning, adjusting pressure and selecting appropriate nozzles.

### ***Spray Volumes:***

Spray volumes of 15 to 150 gallons per acre are recommended. Uniform application is essential. Avoid spray overlaps that will increase the dosage above those recommended.

### ***Surfactants and Spray Colorants:***

The use of a nonionic surfactant is recommended to increase the extent and consistency of the growth regulation. The suggested surfactant rate is 0.25 to 0.50% v/v or 1 to 2 quarts per 100 gallons of spray solution. Temporary, slight discoloration of the turf may increase with the use of a surfactant.

The use of Gordon's Spray Colorant is recommended to allow the applicator to make uniform applications.

### ***Spray Preparation for Embark® 2-S PGR alone:***

1. Pour the required amount of Embark® 2-S PGR into the spray tank containing approximately ½ the required amount of water.
2. When thoroughly mixed, add the measured amount of nonionic surfactant.
3. Add Gordon's Professional Spray Colorant to the spray tank to ensure the uniformity of the application. Refer to instructions <sup>For</sup> of this colorant for the proper concentration.
4. Fill the tank as required with water and spray as recommended.

### ***Spray Preparation for Tank Mixtures:***

Embark® 2-S PGR may be applied in combination with one or more of the specified herbicides or plant growth regulators. These tank mixtures must be used according to the most restrictive label limitations and precautions. No label dosage rate should be exceeded. Follow the labeling of each companion product for precautionary statements, directions for use, dosage rates, and application schedules. Tank mixture recommendations are for use only in states where the companion products and application site are registered.

Follow these guidelines and refer to the labeling of the companion product for further instructions.

1. Add ½ - ⅔ of the required amount of water into the spray tank.
2. Add the appropriate amount of the companion product (dispersible granules, ammonium salt formulations, or dimethylamine salt formulations) into the spray tank with agitation.
3. Pour the appropriate amount of Embark® 2-S PGR into the spray tank.
4. Continue agitation while adding the remainder of water and add the measured amounts of nonionic surfactant and spray colorant.
5. Continue agitation throughout the spraying operation.

### **SEEDHEAD SUPPRESSION:**

The application window or timing is critical for the optimum seedhead control.

Generally the application window for the best results will range from 2 to 3 weeks. The beginning of the application window for Embark® 2-S PGR occurs in the spring after full green-up with rapid vertical growth. The end of the application window occurs approximately 2 weeks prior to the seedhead appearance or when the seedhead can be felt at the base of the stem. Applications of Embark® 2-S PGR after the optimum window will result in reduced seedhead suppression.

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Embark® 2-S PGR must be applied prior to the seedhead appearance at the stem apex. Application of Embark® 2-S PGR after the seedhead emergence will suppress only the later forming seedheads.

Inconsistencies of seedhead suppression may occur with mixed stands. Different grass species may vary in the inflorescence development and in their responses to the plant growth regulators.

Refer to Table 1 for the application rates for seedhead suppression and refer to Table 2 for recommendations appropriate for California.

#### **VEGETATIVE GROWTH SUPPRESSION:**

Embark® 2-S PGR will provide growth inhibition for 6 to 8 weeks under favorable growing conditions. Apply Embark® 2-S PGR with a nonionic surfactant after full green-up of turfgrass in the spring. At the time of treatment, turf should have developed the desired appearance, the desired height, and sufficient leaf area for uptake.

Apply 24 - 32 fl. oz. (1½ - 2.0 pints) of Embark® 2-S PGR per acre with a nonionic surfactant to actively growing turf for growth suppression up to 8 weeks. If temporary discoloration of the turfgrass occurs and is objectionable, reduce the 2 pints of product rate to 1½ pints of product per acre. Refer to Table 1 for the recommended rates for tank mixtures applied to low maintenance turf. Refer to Table 2 for the recommendations appropriate for California.

Embark® 2-S PGR may be applied more than once per season, however follow an application interval of at least 6 weeks between applications.

#### **- CULTURAL RECOMMENDATIONS -**

##### **MOWING:**

1. **Mowing before application:** Grass may be mowed up to two days before applying Embark® 2-S PGR. Clippings and other debris should be removed before spraying. If mowing removes most of the green leaf tissue, spraying should be delayed until sufficient new growth develops to assure product absorption into green leaves.
2. **Mowing after application:** For an evenly trimmed appearance grass may be mowed 3 to 7 days after Embark® 2-S PGR is applied.
3. **When mowing is not desired or practical:** Apply Embark® 2-S PGR after full green-up in the spring, but before mowing is necessary.

##### **IRRIGATION AND RAINFALL:**

Optimum results may not be obtained if rainfall or overhead irrigation occurs within 8 hours following application.

##### **STRESSES:**

Applications of Embark® 2-S PGR to turfgrass that is stressed because of high air temperatures, drought, excessive soil water, diseases, or insects may cause temporary discoloration. Management practices to promote the health and vigor of the turfgrass should be continued on the treated areas.

##### **PRECAUTIONS AND LIMITATIONS:**

- ◆ Do not apply this product through any irrigation system.
- ◆ Turf treated with Embark® 2-S PGR may appear less dense and temporarily discolored when compared with untreated, actively growing turf.
- ◆ Do not allow animals to graze on treated areas.
- ◆ In turfgrass renovation programs, areas treated with Embark® 2-S PGR may be reseeded 3 days following application (except California where reseeding may not occur within 2 weeks).
- ◆ Do not apply to any body of water such as lakes, streams, rivers, canals, ponds, reservoirs, or bays. Also, do not apply to areas where water is present on the soil surface such as swamps, bogs, potholes, or marshes. However, it is allowable to treat seasonally dry swamps, bogs, potholes, or marshes, berms of ditches, and road shoulders.

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**Table 1.** Application Rate Recommendations for Embark® 2-S PGR and tank mixtures for six cool season turfgrasses established in noncropland sites.

Product Name	Amount of Product		Nonionic Surfactant, % vol/vol	Comments
	fl. oz./acre	ounces/acre		
A. TALL FESCUE				
1. Embark® 2-S	24 -32	----	0..25 - 0.50	Applications of 2 pints of product per acre will provide season long seedhead suppression and will provide vegetative growth suppression for up to 8 weeks. If turf discoloration is objectionable, reduce the application rate to 1½ pints of product per acre.
2. Embark® 2-S plus Event Grass Growth Regulator	8 4	----- -----	0.25	Apply after grasses are at 100 percent green-up and have at least two inches of vertical growth. On finer turfgrass areas where more uniform quality is desired, apply after two mowings. For seedhead suppression, apply prior to the time of seed stalk elongation.  Event may be used prior to or sequential to all currently registered herbicides EXCEPT there must be a three month interval of grass growth between applications of Event and sulfonylurea and imidazolinone herbicide applications.
3. Embark® 2-S plus Telar® Herbicide Dispersible Granule plus Hi-Dep® Herbicide, 4.0#/gal	12 - 16 ----- 64	----- 0.25 -----	0.25 - 0.50	<b>For the Northeast and Midwest Regions:</b> Do not apply this tank mixture to turf that is under stress from drought, insects, disease, cold temperatures or poor fertility, as injury may result. Do not apply to turf less than 1 year old. Do not exceed ½ ounce Telar® per acre within a 12 month period.
4. Embark® 2-S plus Telar® Herbicide Dispersible Granule	8 - 16 -----	----- 0.5	0.25	<b>For the Pacific Northwest Region:</b> Do not apply Telar® plus Embark® 2-S to turf that is under stress from drought, insects, disease, cold temperatures or poor fertility, as injury may result. Do not apply to turf less than 1 year old. Do not exceed ½ ounce Telar® per acre within a 12 month period.
5. Embark® 2-S plus Telar® Herbicide Dispersible Granule plus Banvel® Herbicide	12 - 16 ----- 8	----- 0.25 -----	0.25	Do not apply this combination to turf that is under stress from drought, insects, disease, cold temperatures or poor fertility, as injury may result. Do not apply to turf less than 1 year old. Do not exceed ½ ounce Telar® per acre within a 12 month period.
B. KENTUCKY BLUEGRASS				
1. Embark® 2-S	24 -32	----	0.25 - 0.50	Applications of 2 pints of product per acre will provide season long seedhead suppression and will provide vegetative growth suppression for up to 8 weeks. If turf discoloration is objectionable, reduce the application rate to 1½ pints of product per acre.

changed from "Application Rate Recommendations for Embark 2-S PGR and tank mixtures for six cool season grasses" 14/17

Table 1. Continued...

Product Name	Amount of Product		Nonionic Surfactant, % vol/vol	Comments
	fl. oz./acre	ounces/acre		
2. Embark® 2-S plus Event Grass Growth Regulator	8 4	----- -----	0.25	Apply after grasses are at 100 percent green-up and have at least two inches of vertical growth. On finer turfgrass areas where more uniform quality is desired, apply after two mowings. For seedhead suppression, apply prior to the time of seed stalk elongation.  Event may be used prior to or sequential to all currently registered herbicides EXCEPT there must be a three month interval of grass growth between applications of Event and sulfonylurea and imidazolinone herbicide applications.

**C. MIXTURES OF ESTABLISHED KENTUCKY BLUEGRASS AND TALL FESCUE**

1. Embark® 2-S	24 - 32	-----	0.25 - 0.50	Applications of 2 pints of product per acre will provide season long seedhead suppression and will provide vegetative growth suppression for up to 8 weeks. If turf discoloration is objectionable, reduce the application rate to 1½ pints of product per acre.
2. Embark® 2-S plus Event Grass Growth Regulator	8 4	----- -----	0.25	Apply after grasses are at 100 percent green-up and have at least two inches of vertical growth. On finer turfgrass areas where more uniform quality is desired, apply after two mowings. For seedhead suppression, apply prior to the time of seed stalk elongation.  Event may be used prior to or sequential to all currently registered herbicides EXCEPT there must be a three month interval of grass growth between applications of Event and sulfonylurea and imidazolinone herbicide applications.
3. Embark® 2-S plus Telar® Herbicide Dispersible Granules plus Hi-Dep® Herbicide, 4.0#/gal	12 - 16 ----- 64	----- 0.25 -----	0.25 - 0.50	<b>For the Northeast and Midwest Regions:</b> Do not apply this tank mixture to turf that is under stress from drought, insects, disease, cold temperatures or poor fertility, as injury may result. Do not apply to turf less than 1 year old. Do not exceed ½ ounce Telar® per acre within a 12 month period.
4. Embark® 2-S plus Telar® Herbicide Dispersible Granule	4 - 8 -----	----- 0.25	0.25	Do not apply Telar® plus Embark® 2-S to turf that is under stress from drought, insects, disease, cold temperatures or poor fertility, as injury may result. Do not apply to turf less than 1 year old. Do not exceed ½ ounce Telar® per acre within a 12 month period.
5. Embark® 2-S plus Escort Herbicide Dry Flowable	6 - 8 -----	----- 0.125 - 0.25	0.25	For growth suppression and seedhead inhibition of well established turf, apply this combination after at least 2-3 inches of new growth has emerged in the spring until seed stalk (boot) appearance.

**D. PERENNIAL RYEGRASS**

1. Embark® 2-S	24 - 32	-----	0.25 - 0.50	Applications of 2 pints of product per acre will provide season long seedhead suppression and will
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Table 1. Continued...

Product Name	Amount of Product		Nonionic Surfactant, % vol/vol	Comments
	fl. oz./acre	ounces/acre		
				provide vegetative growth suppression for up to 8 weeks. If turf discoloration is objectionable, reduce the application rate to 1½ pints of product per acre.
2. Embark® 2-S plus Event Grass Growth Regulator	8 4	----- -----	0.25	Apply after grasses are at 100 percent green-up and have at least two inches of vertical growth. On finer turfgrass areas where more uniform quality is desired, apply after two mowings. For seedhead suppression, apply prior to the time of seed stalk elongation.  Event may be used prior to or sequential to all currently registered herbicides EXCEPT there must be a three month interval of grass growth between applications of Event and sulfonylurea and imidazolinone herbicide applications.
3. Embark® 2-S plus Telar® Herbicide Dispersible Granule	8 - 12 -----	----- 0.25	0.25	<b>For the Northeast Region:</b> Do not apply Telar® plus Embark® 2-S to turf that is under stress from drought, insects, disease, cold temperatures or poor fertility, as injury may result. Do not apply to turf less than 1 year old. Do not exceed ½ ounce Telar® per acre within a 12 month period.
4. Embark® 2-S plus Telar® Herbicide Dispersible Granule	8 - 16 -----	----- 0.5	0.25	<b>For the Pacific Northwest Region:</b> Do not apply Telar® plus Embark® 2-S to turf that is under stress from drought, insects, disease, cold temperatures or poor fertility, as injury may result. Do not apply to turf less than 1 year old. Do not exceed ½ ounce Telar® per acre within a 12 month period.

**E. SMOOTH BROMEGRASS**

1. Embark® 2-S	24 - 32	-----	0.25 - 0.50	Applications of 2 pints of product per acre will provide season long seedhead suppression and will provide vegetative growth suppression for up to 8 weeks. If turf discoloration is objectionable, reduce the application rate to 1½ pints of product per acre.
2. Embark® 2-S plus Event Grass Growth Regulator plus Arsenal® Herbicide	8 4 1.5	----- -----	0.25	Apply after grasses are at 100 percent green-up and have at least two inches of vertical growth. On finer turfgrass areas where more uniform quality is desired, apply after two mowings. For seedhead suppression, apply prior to the time of seed stalk elongation.  Event may be used prior to or sequential to all currently registered herbicides EXCEPT there must be a three month interval of grass growth between applications of Event and sulfonylurea and imidazolinone herbicide applications
3. Embark® 2-S plus Telar® Herbicide Dispersible Granule	8 - 16 -----	----- 0.5	0.25	<b>For the Pacific Northwest Region:</b> Do not apply Telar® plus Embark® 2-S to turf that is under stress from drought, insects, disease, cold temperatures or poor fertility, as injury may result. Do not apply to turf less than 1 year old. Do not exceed ½ ounce Telar® per acre within a 12 month period.

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Table 1. Continued...

Product Name	Amount of Product		Nonionic Surfactant, % vol/vol	Comments
	fl. oz./acre	ounces/acre		
F. ORCHARDGRASS				
1. Embark® 2-S	24 - 32	-----	0.25 - 0.50	Applications of 2 pints of product per acre will provide season long seedhead suppression and will provide vegetative growth suppression for up to 8 weeks. If turf discoloration is objectionable, reduce the application rate to 1½ pints of product per acre.
2. Embark® 2-S plus Event Grass Growth Regulator plus Arsenal® Herbicide	8 4 1.5	----- -----	0.25	Apply after grasses are at 100 percent green-up and have at least two inches of vertical growth. On finer turfgrass areas where more uniform quality is desired, apply after two mowings. For seedhead suppression, apply prior to the time of seed stalk elongation.  Event may be used prior to or sequential to all currently registered herbicides EXCEPT there must be a three month interval of grass growth between applications of Event and sulfonylurea and imidazolinone herbicide applications.
3. Embark® 2-S plus Telar® Herbicide Dispersible Granule	8 - 16 -----	----- 0.5	0.25	<b>For the Pacific Northwest Region:</b> Do not apply Telar® plus Embark® 2-S to turf that is under stress from drought, insects, disease, cold temperatures or poor fertility, as injury may result. Do not apply to turf less than 1 year old. Do not exceed ½ ounce Telar® per acre within a 12 month period.
G. REED CANARYGRASS				
1. Embark® 2-S	24 - 32	-----	0.25 - 0.50	Applications of 2 pints of product per acre will provide season long seedhead suppression and will provide vegetative growth suppression for up to 8 weeks. If turf discoloration is objectionable, reduce the application rate to 1½ pints of product per acre.
2. Embark® 2-S plus Telar® Herbicide Dispersible Granule	8 - 16 -----	----- 0.5	0.25	<b>For the Pacific Northwest Region:</b> Do not apply Telar® plus Embark® 2-S to turf that is under stress from drought, insects, disease, cold temperatures or poor fertility, as injury may result. Do not apply to turf less than 1 year old. Do not exceed ½ ounce Telar® per acre within a 12 month period.



**Table 2. Application Rate Recommendations Appropriate for Use On Roadsides and Low Maintenance Turfgrass in California Only**

<b>Turfgrass</b>	<b>Amount of Product, pints/acre</b>	<b>Comments</b>
Kentucky Bluegrass Tall Fescue Perennial Ryegrass Reed Canarygrass	1½ pints	For grasses recommended at the 1½ pint rate, reduce the rate to 1 pint/acre if temporary discoloration of turf occurs and is objectionable. In turfgrass renovation programs, areas treated with Embark 2-S PGR may be reseeded 2 weeks following application.
<i><b>Native Grasses &amp; Broadleaf Vegetation Grasses:</b></i> Wild Barley, Red Brome, Ripgut Brome, Wild Oats  <i><b>Broadleaves:</b></i> Cheeseweed, Sour Clover, Fiddleneck, Redstem Filaree, Black Mustard	2 pints	For native grass and broadleaf vegetation, areas with high soil fertility may require up to 4 pints of product per acre.

#### **LIMITED WARRANTY AND DISCLAIMER.**

The manufacturer warrants only that the chemical composition of this product conforms to the ingredient statement given on the label, and that the product is reasonably suited for the labeled use when applied according to the Directions for Use.

THE MANUFACTURER NEITHER MAKES NOR INTENDS ANY OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE EXPRESSLY DISCLAIMED. This limited warranty does not extend to the use of the product inconsistent with label instructions, warnings or cautions, or to use of the product under abnormal conditions such as drought, excessive rainfall, tornadoes, hurricanes, etc. These factors are beyond the control of the manufacturer or the seller. Any damages arising from a breach of the manufacturer's warranty shall be limited to direct damages, and shall not include indirect or consequential damages such as loss of profits or values, except as otherwise provided by law.

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