

SHAUGHNESSEY NO.
111601

REVIEW NO.

EEB BRANCH REVIEW

DATE: IN 6-22-84 OUT AUG 6 1984

FILE OR REG. NO. 707-145, 707-174

PETITION OR EXP. PERMIT NO.

DATE OF SUBMISSION 6-14-84

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EEB ESTIMATED COMPLETION DATE 8-20-84

RD ACTION CODE/TYPE OF REVIEW 305/Amendment

TYPE PRODUCT(S): I, D, H, F, N, R, S Herbicide

DATA ACCESSION NO(S).

PRODUCT MANAGER NO. R. Mountfort (23)

PRODUCT NAME(S) Goal 1.6E 707-174

Goal 2E 707-145

COMPANY NAME Rohm and Haas Company

SUBMISSION PURPOSE Proposed Registration of Aerial Application

to Cotton Fallow Beds in California and

Arizona

SHAUGHNESSEY NO. CHEMICAL, & FORMULATION % A.I.

111601 Oxyfluorfen

(1)

Goal 1.6E

100 Submission Purpose and Label Information

100.1 Submission Purpose

With this submission Rohm and Haas proposes to add to existing cotton labels. The existing labels permit ground application of Goal 1.6E and Goal 2E to cotton fallow fields. This label change would permit aerial application at the ground application rates to fallow cotton fields in Arizona and California. In addition Rohm and Haas submitted a field drift monitoring study.

100.2 Formulation Information

Goal 1.6E is 19.4% oxyfluorfen
Goal 2E is 22.6% oxyfluorfen

100.3 Application Methods, Directions and Rates

Apply Goal 1.6E at 1.25 to 2.5 pints (0.25 to 0.5 lb. a.i.) per acre. Aerial application should be made at a height of 6 to 10 feet above the soil surface.

Apply Goal 2E at 1 to 2 pints (0.25 to 0.5 lb. a.i.) per acre. Aerial application should be made at a height of 6 to 10 feet above the soil surface.

Note that this is a fallow bed treatment which means the soil surface should be smooth and free of crop debris and weed trash. In other words this is application to bare soil.

100.4 Target Organism

Weeds

100.5 Precautionary Labeling

The general labels (1.6E and 2E) both state:

"Do not apply directly to water. Do not contaminate water by cleaning of equipment or disposal of wastes.

This product is highly toxic to aquatic invertebrates, aquatic plants, wildlife and fish. Use with care when applying in areas frequented by wildlife or adjacent to any body of water or wetland area. Do not apply when weather conditions favor drift or erosion from target areas"

The supplemental labeling for both formulations states:

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"Do not apply when wind direction is not stable, when inversion conditions exist, or when wind velocity exceeds 10 mph"

The latter statement is to protect desirable vegetation but could, if followed, protect non-target organisms.

101 Hazard Assessment

101.1 Discussion

These formulations (1.6E and 2E) are presently registered on cotton at the proposed use rates. This label change would not result in an increase in acreage subject to treatment.

101.2 Likelihood of Adverse Effects to Non-target Organisms

In EEB's previous review (6/30/81) the hazards of using goal on cotton were partially assessed. That review stated that using goal on cotton could have:

1. Chronic adverse effects to fish;
2. Acute effects on clams or molluscs; and
3. Adverse effects on endangered species.

The hazard assessment could not be completed because field monitoring data were lacking.

Since then the field study was submitted. It was categorized as supplemental because pertinent information was lacking. Even though it did not fulfill the requirement, the study showed that if oxyfluorfen gets into the water, it will occur in the sediment and not in the water column. The missing information has been identified in a previous review; Rohm and Haas has been notified of these data requirements. When the information is provided and if the study validation category is upgraded, the hazard assessment for the use of goal on cotton will be completed.

This proposal is to use aerial application on fallow cotton fields in Arizona and California. A field drift study was conducted and submitted, see attached DER. In summary, this field study showed that when applied aerially, goal will drift substantially to 100 meters. Extrapolations from the results of that field study suggest that residues from drift in water 100 meters downwind from an aerially treated field could exceed the oyster embryolarvae 48-hr LC50^{1/}, the fish MATC, and 1/20th the fish LC50. It is therefore assumed that this new use would increase exposure to non-target organisms.

^{1/} Even though the embryolarvae study did not provide a statistically estimated LC50, EEB will use the 32 ppb level as the LC50 for this hazard assessment. Furthermore, this value will be used for freshwater mussels also.

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Extrapolation Rationale: The field drift study "measured" damage to plants from the drift. The damage to observed plants was rated on a numerical scale of 1 to 10 where 1 is no damage and 10 is death to plant. In this review, these categories at the various distances were used to develop percentages.

Distance (meters)	$\bar{X}$ Damage	Percent of Direct Application	Concentration (ppb)		
			6"	1'	3'
0	7.5	100%	367.5*	183.8	61.3
25	6.5	87%	319.7	159.9	79.9
50	6	80%	294.0	147.0	49.0
100	4	57%	209.5	104.7	34.9
200	0.95	13%	47.8	23.9	7.9

*Taken from monograph using direct application of 0.5 lbs. a.i. per acre to 6 inches of water.

This assumes the 7.5 rating at 0 meters is a maximum or direct application. The concentrations are applicable to a standing water column with no dilution from current. In instances where the aquatic habitat was shallow and very close to the treated area, residue levels would be high enough for fish to experience adverse acute effects. However, since oxyfluorfen tends to bind to sediment, the exposure in the water column would be short-term. The contaminant would build up in the top layer of the sediment (about 1 cm) at around 3 ppm.

6" X 2.5 cm in an inch = 15 cm in 6 inches
209 ppb in 6" X 15 cm = 3100 ppb or 3.1 ppm

Bottom-feeding fish and benthic organisms such as mussels would be exposed to this levels. Note that this value is an estimation from an extrapolation and is not validated by measurements in the field. As such it is subject to broad interpretation. Furthermore, this is based on a worst case scenario of standing water where all the residues go straight to the bottom in a few days. In flowing water, dilution would significantly reduce these concentrations.

Based on the above discussion, it is assumed that aerial application will cause acute and chronic exposure to more nontarget organisms than with just ground application. However, these hazardous levels are dependent on drift and the factors that affect drift such as wind direction and meteorological conditions. Thus this exposure would not be expected to be continual in any one aquatic habitat. The risks to nontarget organisms are, therefore, not considered significant.

101.3 Endangered Species Considerations

This new use is not likely to have an effect on avian, mammalian or reptilian endangered species because of the low toxicity of goal to birds and mammals. The toxicity of goal to reptiles is

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According to the biological opinion the USFWS Office of Endangered Species provided for the cotton cluster review, there are no aquatic endangered species that could be affected by pesticides applied to cotton in Arizona and California. Therefore this new use will not have an adverse effect on any aquatic endangered species.

101.4 Adequacy of Toxicity Data

The available data were adequate to perform this hazard assessment.

101.5 Adequacy of Labeling

The environmental hazard caution statement that is now on the label is sufficient.

103 Conclusions

EEB has completed an incremental risk assessment (3(c)(7)finding) of the proposed conditional registration to aerially apply goal to cotton in California and Arizona. Based on available data EEB concludes that the proposed use provides for some increase in exposure to nontarget organisms but no significant increase in acute or chronic risks.

Daniel Rieder 8/6/84
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Wildlife Biologist
Section 2

Norm Cook 8.6.84
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Hazard Evaluation Division

DATA EVALUATION REPORT

1. CHEMICAL: Goal
2. FORMULATION: 1.6 Herbicide

Shaughnessy Number: 111601

3. CITATION: Holmdal, Jay A. 1984. Field Drift Loss Studies from Aerial Application by Goal Herbicide. An unpublished study prepared by Rohm and Haas Company. Data Acc. #253548
4. REVIEWER: Daniel Rieder
Wildlife Biologist
EEB/HED
5. REVIEW DATE: 6/28/84
6. TEST TYPE: Field drift monitoring
7. RESULTS:

The study was designed to determine if aerial application would result in drift from treated area and cause adverse effects to plants outside the treated area. Goal was applied under three different scenarios:

1. wind 1-5 mph
2. wind 6-10 mph
3. wind >10 mph

Based on visual injury to test plants, drift was worse in the 6-10 mph situation. Drift occurred in all scenarios to some extent.

8. CONCLUSION:

This test provides information that can be used in a hazard assessment. It shows that Goal will drift 100 to 150 meters following typical aerial application. The problem with the study is that it does not tell how much Goal actually drifted from the treated area.

Methods

Three field drift loss studies were conducted as part of research for an EUP. Applications were made either on January 31, or February 1, 1984. Environmental data were recorded during applications. Wind speed, air temperature and relative humidity were collected two meters above soil surfaces. A ground level smoke column was used at target site prior to and during application to determine atmospheric stability.

Goal was applied by air during three different wind speed conditions: 1 to 5 mph (Experiment No. 818407); 6 to 10 mph (Exp. No. 858406); and greater than 10 mph (Exp. No. 818406).

<u>Exp. No.</u>	<u>Date</u>	<u>California County</u>	<u>Acres</u>	<u>Air Temp.</u>	<u>Wind Speed</u>	<u>Wind Direction</u>	<u>Type Aircraft</u>
818407	1/31/84	Kern	55	78°F	5 mph	NW	Fixed
858406	2/1/84	Fresno	75	63°F	5-10	SE	Fixed
818406	1/31/84	Kern	53	78°F	12	N	Rotary

Goal 1.6E herbicide was aerially applied at maximum use rate of 2.5 pints (0.5 lb. active) per acre. Triton AG-98 low foam spray adjuvant was used.

Extent of pesticide exposure from drift was determined by bioassay. Lettuce was chosen as an indicator plant because it responds quickly to Goal herbicide. On the day of the test, lettuce transplants 4 to 8 inches in height and in good health. Two sets of controls were used, one remained at the greenhouse, the other stayed in the transport vehicle.

About 1 hour before application the flats of lettuce, each containing 6 plants, were set in nontarget areas adjacent to the intended application sites. Downwind and upwind bioassay plants were placed in a straight line parallel to the wind direction extending in both directions from the treated field. Plants were also placed in a straight line out from the side of the treated area at a 90° angle from the wind direction. See figure 1. On the downwind side plants were spaced at 25, 50, 100, 200, 400 and 800 meters, two flats (10 meters apart) at each interval. To the sides and upwind plants were spaced at 25, 50, 100, and 200 meters from the field.

Flight direction during application was perpendicular to the wind direction.

After application, plants were left for 1 1/2 hour. Then they were collected and carried to the greenhouse and maintained 3 days under optimum growing conditions. At that time visual ratings of herbicide injury were made on a scale of 0 (no injury) to 10 (complete death).

Results

Drift occurred at all wind speeds but was greatest at 6-10 mph. See tables 1, 2 and 3.

Discussion

The researcher explained that the reason for more drift at 6-10 mph than at >10 mph was that the helicopter flew lower and slower. This resulted in less droplet breakup and reduced drift.

Reviewers Evaluation

The study results are of limited value because there is no measurement of the amount of Goal which drifts. It does show that when applied by fixed wing aircraft in 6-10 mph wind, Goal will drift up to 100 meters; enough to cause obvious plant injury.

Conclusion:

Category: Supplemental

Rationale: The study does not provide quantitative information on the amount of oxyfluorfen that actually drifted from the treated area.

Repairability: This study is not upgradeable.

RIN 0637-00

EFED Review - Oxyfluorfen

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Pages 1 through 12 are not included.

The material not included contains the following type of information:

- ☐ Identity of product inert ingredients.
- ☐ Identity of product impurities.
- ☐ Description of the product manufacturing process.
- ☐ Description of quality control procedures.
- ☐ Identity of the source of product ingredients.
- ☐ Sales or other commercial/financial information.
- ☐ A draft product label.
- ☐ The product confidential statement of formula.
- ☐ Information about a pending registration action.
- ☒ FIFRA registration data.
- ☐ The document is a duplicate of page(s) .
- ☐ The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

ROHM AND HAAS COMPANY

INDEPENDENCE MALL WEST

PHILADELPHIA, PENNSYLVANIA 19105



EPA Reg. No. 707-145-AA
EPA Est. No. 707-PA-1

Supplemental Labeling for Aerial Application of GOAL^R 2E Herbicide on Fallow Beds

For use only in California and Arizona

TREATMENTS MUST BE MADE OCTOBER 1 THROUGH FEBRUARY 15.

DIRECTIONS FOR USE

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

NOTICE: Before using this product, read the entire Precautionary Statements, Conditions of Sale and Warranty, Directions for Use, Use Precautions and Storage and Disposal Instructions on back panel and attached use directions. If the conditions of Sale and Warranty are not acceptable, return the product unopened within thirty days of purchase to the place of purchase.

GENERAL INFORMATION

GOAL 2E is effective as a preemergence and/or postemergence herbicide when used alone or in a tank mix combination with Roundup^R or paraquat (Gramoxone^R or Ortho^R paraquat) for the control of winter annual broadleaf weeds in fallow beds. Do not apply within 14 days of planting. The fallow beds should be worked with a Lilliston, or similar incorporation tool, to a depth of at least 2 inches prior to planting. It is important to thoroughly break the soil surface prior to planting; weed control should not be expected following breaking of the soil surface.

EXERCISE EXTREME CARE TO AVOID HERBICIDE CONTACT WITH ANY DESIRABLE DORMANT OR NON-DORMANT CROP, PLANT, TREE OR VEGETATION AS SEVERE INJURY MAY RESULT.

Cotton can be planted 14 days or more following a GOAL 2E herbicide fallow bed application.

GOAL 2E HERBICIDE USED ALONE DOSAGE

GOAL 2E herbicide used at 1.0 to 2.0 pints (0.25 to 0.5 lb. active) per broadcast acre. The lower rate (1.0 pints per acre) should provide postemergence control of susceptible weeds (up to 4 leaf stage) and provide up to 4 weeks of preemergence control of susceptible weeds. The higher rate (2.0 pints per acre) should provide postemergence control of susceptible weeds (up to 6 leaf stage) and preemergence control of susceptible weeds for up to 8 weeks. Best preemergence control is achieved when preirrigation or rainfall occurs within 3 or 4 weeks following application.

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WEEDS CONTROLLED

GOAL 2E herbicide should provide preemergence and postemergence control of the following weeds when used at recommended dosages and weed stage.

CHEESEWEED (MALVA)	Malva parviflora
FIDDLENECK, COAST	Amsinckia intermedia
FILAREE, BROADLEAF	Erodium botrys
FILAREE, REDSTEM	Erodium cicutarium
GROUNDSEL, COMMON	Senecio vulgaris
HENBIT	Lamium amplexicaule
LETTUCE, MINERS	Montia perfoliata
MUSTARD, BLACK	Brassica nigra
NETTLE, BURNING	Urtica urens
REDMAIDS	Calandrinia caulescens
ROCKET, LONDON	Sisymbrium irio
SOWTHISTLE, ANNUAL	Sonchus oleraceus

GOAL 2E is a contact herbicide, therefore, coverage is essential for acceptable postemergence control. If dense weed populations, oversized weed seedlings, volunteer grains, annual grasses or unfavorable environmental conditions exist, a tank mixture of GOAL 2E herbicide with Roundup or paraquat for postemergence control is recommended.

AERIAL APPLICATION

GOAL 2E herbicide should be applied using swirl jet or hollow cone nozzles and a spray pressure below 40 psi to deliver a minimum of 10 gallons of water per acre. Application should be made at a height of 6 to 10 feet above the soil surface. It is suggested that the nozzles on the spray booms should not be placed any closer to the wing or rotor tips than 3/4 of the span; this will minimize the formation of spray or wing tip vortice roll. Nozzles should be spaced and positioned to produce a uniform spray pattern and to minimize or eliminate the formation of droplets 100 microns or less in diameter.

AVOID DRIFT:

WHEN APPLYING TO FALLOW BEDS, EXTREME CARE MUST BE EXERCISED TO PREVENT SPRAY DRIFT WHICH COULD RESULT IN DAMAGE TO OTHER CROPS AND DESIRABLE VEGETATION. USE THE FOLLOWING GUIDELINES WHEN AERIAL APPLICATIONS ARE TO BE MADE:

1. Do not apply when the wind direction is not stable, when inversion conditions exist, or when wind velocity exceeds 10 mph.
2. When wind speeds are 5 mph or less, maintain a minimum downwind buffer zone of at least 1/2 mile from all crops and desirable vegetation, except the following:

Maintain a minimum downwind buffer zone of:

- . 150 feet from dormant treefruit, dormant vines and overwintering beets.
 - . 650 feet from garlic, jojoba, legumes, onions, pastures, small grains, seedling sugarbeets, and vegetable fallow beds.
3. When wind speeds are between 5 to 10 mph, downwind buffer zones in excess of those listed above are suggested.
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4. For upwind and side borders, maintain a minimum buffer zone of 150 feet from any vegetable fallow bed, crop, or desirable vegetation.

The use of a drift control agent may reduce drift hazard; however, the drift control agent may also decrease the weed control activity. The user will assume all risks as a result of using a drift control agent.

IMPORTANT:

Aerial applicators must be familiar with the EPA registered label and follow the use precautions. Spraying GOAL 2E herbicide in a manner other than as recommended is done at the user's risk. Users are responsible for all loss or damage which results from such spraying. In addition, aerial applicators should follow all applicable state and local regulations and ordinances. In interpreting the label and local regulations, the most restrictive situations should apply to avoid drift hazards.

MIXING DIRECTIONS

Fill the spray tank at least one-third full of clean water and add the recommended amount of GOAL 2E herbicide while the pump and agitator are running. Complete filling of the spray tank with water and then add 1 quart of TRITON AG-98 or comparable 80% active nonionic surfactant, cleared for use on growing crops, per 100 gallons of spray. Maintain agitation until spraying is complete.

CULTURAL CONSIDERATIONS

In order for GOAL 2E herbicide to provide maximum preemergence activity, the bed or soil surface should be smooth and free of crop and weed trash (decaying leaves, clippings, dead weeds, etc.).

For best preemergence activity, preirrigation or rainfall should occur within 3 or 4 weeks after application. Cultural practices which result in redistribution or disturbance of the soil surface after treatment will decrease the herbicidal effectiveness of GOAL 2E. The best results from GOAL 2E herbicide are from applications to established beds or soil surfaces which are left undisturbed during the time period for which weed control is desired.

GOAL 2E HERBICIDE - TANK MIXES DOSAGE

GOAL 2E herbicide can be tank mixed with paraquat or Roundup to obtain postemergence control of annual grassy weeds. Tank mix 1.0 to 2.0 pints (0.25 to 0.5 lb. active) of GOAL 2E herbicide with 1 to 2 quarts (0.5 to 1.0 lb. active) of paraquat or 0.5 to 1.0 pint (0.25 to 0.5 lb. active) of Roundup for each acre treated. Refer to the "Preplant or Preemergence Uses" Section on the Ortho paraquat CL label or the Gramoxone label or the "Fallow and Reduced Tillage System" Section on the Roundup label for specific use directions and restrictions. Apply at the recommended rates and growth stages to susceptible weed species in a manner described on the respective labels.

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TANK MIXING DIRECTIONS

Fill the spray tank at least one-third full of clean water and add the recommended amounts of GOAL 2E herbicide and paraquat or Roundup while the pump and agitator are running. Complete filling of the spray tank with water. Add 1 quart of TRITON AG-98 or comparable 80% active nonionic surfactant, cleared for use on growing crops, per 100 gallons of spray. Maintain agitation until spraying is complete.

FALLOW BED - SPECIFIC USE RESTRICTIONS

- . Read and observe all label directions before using. When tank mixing, always read all individual manufacturers' labels. In interpreting all labels for the tank mixture, the most restrictive situations must apply.
- . DO NOT AERIALY APPLY GOAL 2E HERBICIDE (EITHER ALONE OR IN ANY COMBINATION RECOMMENDED ON THIS LABEL) TO FALLOW BEDS BEFORE OCTOBER 1 OR AFTER FEBRUARY 15.
- . Do not apply more than 2.0 pints (0.5 lb. active) of GOAL 2E herbicide per acre, per fallow season.
- . Do not apply GOAL 2E herbicide within 14 days of planting.
- . Do not rotate to any crops other than cotton or soybeans for 10 months following a GOAL 2E herbicide fallowbed application.
- . Do not contaminate irrigation water or water used for domestic purposes.
- . Do not use any plants treated with GOAL 2E herbicide for feed or forage.
- . Do not feed or allow animals to graze on any areas treated with GOAL 2E herbicide.
- . GOAL 2E herbicide should be applied only by ground application equipment except as specifically directed on this label or on other approved Rohm and Haas Company supplemental labeling.
- . Do not apply when weather conditions favor drift. Avoid drift to all non-target areas. GOAL 2E herbicide is phytotoxic to plant foliage.
- . Thoroughly flush spray equipment (tank, pump, hoses and boom) with clean water before and after each use. Residual GOAL 2E herbicide remaining in spray equipment may damage other crops. To assist removal of GOAL herbicide residues in spray equipment, TRITON AG-98 or TRITON CS-7 may be added at the rate of 1 quart per 100 gallons of water during flushing.

- . Use GOAL 2E herbicide only for recommended purposes and at recommended rates.
- . Do not treat ditch banks or waterways with GOAL 2E herbicide.

GOAL^R 2E and TRITON AG-98 are registered trademarks of Rohm and Haas Company.

GRAMOXONE^R is a registered trademark of ICI Americas Inc.

ROUNDUP^R is a registered trademark of Monsanto Company.

ORTHO^R is a registered trademark of the Chevron Chemical Company.

CONDITIONS OF SALE AND WARRANTY

Rohm and Haas warrants that the product conforms to its chemical description and is reasonably fit for the purpose stated on the label only when used in accordance with label directions under normal conditions of use. ROHM AND HAAS MAKES NO OTHER EXPRESS OR IMPLIED WARRANTIES EITHER OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE. Crop injury, ineffectiveness or other unintended consequences resulting from such factors as failure to follow label directions, weather or soil conditions, presence of other materials, disease, pests, drift to other crops or property, handling, storage and manner of use are beyond the control of Rohm and Haas and Seller. All such risks will be assumed by the Buyer or User. In no case will Rohm and Haas or Seller be held liable for consequential, special or indirect damages resulting from the use or handling of this product.

JAH:ew
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ROHM AND HAAS COMPANY

INDEPENDENCE MALL WEST

PHILADELPHIA, PENNSYLVANIA 19105



EPA Reg. No. 707-174-AA
EPA Est. No. 707-PA-1

Supplemental Labeling for Aerial Application of GOAL^R 1.6E Herbicide on Fallow Beds

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GENERAL INFORMATION

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EXERCISE EXTREME CARE TO AVOID HERBICIDE CONTACT WITH ANY DESIRABLE DORMANT OR NON-DORMANT CROP, PLANT, TREE OR VEGETATION AS SEVERE UNJURY MAY RESULT.

Cotton can be planted 14 days or more following a GOAL 1.6E herbicide fallow bed application.

GOAL 1.6E HERBICIDE USED ALONE DOSAGE

GOAL 1.6E herbicide used at 1.25 to 2.5 pints (0.25 to 0.5 lb. active) per broadcast acre. The lower rate (1.25 pints per acre) should provide postemergence control of susceptible weeds (up to 4 leaf stage) and provide up to 4 weeks of preemergence control of susceptible weeds. The higher rate (2.5 pints per acre) should provide postemergence control of susceptible weeds (up to 6 leaf stage) and preemergence control of susceptible weeds for up to 8 weeks. Best preemergence control is achieved when preirrigation or rainfall occurs within 3 or 4 weeks following application.

WEEDS CONTROLLED

GOAL 1.6E herbicide should provide preemergence and postemergence control of the following weeds when used at recommended dosages and weed stage.

CHEESEWEED (MALVA)	Malva parviflora
FIDDLENECK, COAST	Amsinckia intermedia
FILAREE, BROADLEAF	Erodium botrys
FILAREE, REDSTEM	Erodium cicutarium
GROUNDSEL, COMMON	Senecio vulgaris
HENBIT	Lamium amplexicaule
LETTUCE, MINERS	Montia perfoliata
MUSTARD, BLACK	Brassica nigra
NETTLE, BURNING	Urtica urens
REDMAIDS	Calandrinia caulescens
ROCKET, LONDON	Sisymbrium irio
SOWTHISTLE, ANNUAL	Sonchus oleraceus

GOAL 1.6E is a contact herbicide, therefore, coverage is essential for acceptable postemergence control. If dense weed populations, oversized weed seedlings, volunteer grains, annual grasses or unfavorable environmental conditions exist, a tank mixture of GOAL 1.6E herbicide with Roundup or paraquat for postemergence control is recommended.

AERIAL APPLICATION

GOAL 1.6E herbicide should be applied using swirl jet or hollow cone nozzles and a spray pressure below 40 psi to deliver a minimum of 10 gallons of water per acre. Application should be made at a height of 6 to 10 feet above the soil surface. It is suggested that the nozzles on the spray booms should not be placed any closer to the wing or rotor tips than 3/4 of the span; this will minimize the formation of spray or wing tip vortice roll. Nozzles should be spaced and positioned to produce a uniform spray pattern and to minimize or eliminate the formation of droplets 100 microns or less in diameter.

AVOID DRIFT:

WHEN APPLYING TO FALLOW BEDS, EXTREME CARE MUST BE EXERCISED TO PREVENT SPRAY DRIFT WHICH COULD RESULT IN DAMAGE TO OTHER CROPS OR DESIRABLE VEGETATION. USE THE FOLLOWING GUIDELINES WHEN AERIAL APPLICATIONS ARE TO BE MADE:

1. Do not apply when the wind direction is not stable, when inversion conditions exist, or when wind velocity exceeds 10 mph.
2. When wind speeds are 5 mph or less, maintain a minimum downwind buffer zone of at least 1/2 mile from all crops and desirable vegetation, except the following:.

Maintain a minimum downwind buffer zone of:

- . 150 feet from dormant treefruit, dormant vines and overwintering beets.
 - . 650 feet from garlic, jojoba, legumes, onions, pastures, small grains, seedling sugarbeets, and vegetable fallow beds.
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3. When wind speeds are between 5 to 10 mph, downwind buffer zones in excess of those listed above are suggested.
4. For upwind and side borders, maintain a minimum buffer zone of 150 feet from any vegetable fallow bed, crop, or desirable vegetation.

The use of a drift control agent may reduce drift hazard; however, the drift control agent may also decrease the weed control activity. The user will assume all risks as a result of using a drift control agent.

IMPORTANT:

Aerial applicators must be familiar with the EPA registered label and follow the use precautions. Spraying GOAL 1.6E herbicide in a manner other than as recommended is done at the user's risk. Users are responsible for all loss or damage which results from such spraying. In addition, aerial applicators should follow all applicable state and local regulations and ordinances. In interpreting the label and local regulations, the most restrictive situations should apply to avoid drift hazards.

MIXING DIRECTIONS

Fill the spray tank at least one-third full of clean water and add the recommended amount of GOAL 1.6E herbicide while the pump and agitator are running. Complete filling of the spray tank with water and then add 1 quart of TRITON AG-98 or comparable 80% active nonionic surfactant, cleared for use on growing crops, per 100 gallons of spray. Maintain agitation until spraying is complete.

CULTURAL CONSIDERATIONS

In order for GOAL 1.6E herbicide to provide maximum preemergence activity, the bed or soil surface should be smooth and free of crop and weed trash (decaying leaves, clippings, dead weeds, etc.).

For best preemergence activity, preirrigation or rainfall should occur within 3 or 4 weeks after application. Cultural practices which result in redistribution or disturbance of the soil surface after treatment will decrease the herbicidal effectiveness of GOAL 1.6E. The best results from GOAL 1.6E herbicide are from applications to established beds or soil surfaces which are left undisturbed during the time period for which weed control is desired.

GOAL 1.6E HERBICIDE - TANK MIXES DOSAGE

GOAL 1.6E herbicide can be tank mixed with paraquat or Roundup to obtain postemergence control of annual grassy weeds. Tank mix 1.25 to 2.5 pints (0.25 to 0.5 lb. active) of GOAL 1.6E herbicide with 1 to 2 quarts (0.5 to 1.0 lb. active) of paraquat or 0.5 to 1.0 pint (0.25 to 0.5 lb. active) of Roundup for each acre treated. Refer to the "Preplant or Preemergence Uses" Section on the Ortho paraquat CL label or the Gramoxone label or the "Fallow and Reduced Tillage System" Section on the Roundup label for specific use directions and restrictions. Apply at the recommended rates and growth stages to susceptible weed species in a manner described on the respective labels.

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TANK MIXING DIRECTIONS

Fill the spray tank at least one-third full of clean water and add the recommended amounts of GOAL 1.6E herbicide and paraquat or Roundup while the pump and agitator are running. Complete filling of the spray tank with water. Add 1 quart of TRITON AG-98 or comparable 80% active nonionic surfactant, cleared for use on growing crops, per 100 gallons of spray. Maintain agitation until spraying is complete.

FALLOW BED - SPECIFIC USE RESTRICTIONS

- . Follow General Use Restrictions listed on the GOAL 1.6E herbicide label.
- . Read and observe all label directions before using. When tank mixing, always read all individual manufacturers' labels. In interpreting all labels for the tank mixture, the most restrictive situations must apply.
- . DO NOT AERIALY APPLY GOAL 1.6E HERBICIDE (EITHER ALONE OR IN ANY COMBINATION RECOMMENDED ON THIS LABEL) TO FALLOW BEDS BEFORE OCTOBER 1 OR AFTER FEBRUARY 15.
- . Do not apply more than 2.5 pints (0.5 lb. active) of GOAL 1.6E herbicide per acre, per fallow season.
- . Do not apply GOAL 1.6E herbicide within 14 days of planting.
- . Do not rotate to any crops other than cotton or soybeans for 10 months following a GOAL 1.6E herbicide fallowbed application.

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ROUNDUP^R is a registered trademark of Monsanto Company.

ORTHOR^R is a registered trademark of the Chevron Chemical Company.

CONDITIONS OF SALE AND WARRANTY

Rohm and Haas warrants that the product conforms to its chemical description and is reasonably fit for the purpose stated on the label only when used in accordance with label directions under normal conditions of use. ROHM AND HAAS MAKES NO OTHER EXPRESS OR IMPLIED WARRANTIES EITHER OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE. Crop injury, ineffectiveness or other unintended consequences resulting from such factors as failure to follow label directions, weather or soil conditions, presence of other materials, disease, pests, drift to other crops or property, handling, storage and manner of use are beyond the control of Rohm and Haas and Seller. All such risks will be assumed by the Buyer or User. In no case will Rohm and Haas or Seller be held liable for consequential, special or indirect damages resulting from the use or handling of this product.

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