

US EPA ARCHIVE DOCUMENT

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SHAUGHNESSEY NO.

3
REVIEW NO.

EE BRANCH REVIEW

DATE: IN 2/16/84 OUT 3/15/84

FILE OR REG. NO. 10182-EUP-GU

PETITION OR EXP. PERMIT NO.

DATE OF SUBMISSION 1/10/84

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TYPE PRODUCT(S): I, D, H, E, N, R, S Herbicide/Plant Growth Regulator

DATA ACCESSION NO(S).

PRODUCT MANAGER NO. R. Taylor (25)

PRODUCT NAME(S) Parlay 50 WP

COMPANY NAME ICI Americas, Inc.

SUBMISSION PURPOSE Proposed EUP for use on ornamental and turf grasses
grown for seed

SHAUGHNESSEY NO. CHEMICAL & FORMULATION S.A.I.

125601 (ZRS, 3RS)-1-(4-chlorophenyl)-4,4-dimethyl-2-

(1H-1,2,4-triazol-1-yl) pentan-3-ol

50%

Pesticide Name: Paclobutrazol (Parlay)

100 Submission Purpose and Label Information

100.1 Submission Purpose and Pesticide Use

(Excerpted from EUP request)

***OBJECTIVES OF THE PROPOSED EXPERIMENTAL PROGRAM**

The objectives of the proposed experimental program are as follows:

A. To determine the effectiveness of PARLAY Plant growth regulator for increasing grass seed crop yields and reducing lodging under a variety of growing conditions. A list of species to be investigated follows:

- | | |
|--------------------|-----------------------|
| 1. Timothy | 6. Orchardgrass |
| 2. Chewings Fescue | 7. Annual Ryegrass |
| 3. Red Fescue | 8. Perennial Ryegrass |
| 4. Tall Fescue | 9. Kentucky Bluegrass |
| 5. Bentgrass | |

The following aspects are to be investigated:

1. Crop height control
2. Crop lodging control
3. Crop yield
4. Persistence of effect
5. Effect of rainfall or irrigation on activity
6. Degree of beneficial disease control
7. Timing of application relative to crop growth stage
8. Effect of nitrogen fertilization on efficacy
9. Effect of crop age on efficacy
10. Effect of soil type on efficacy
11. Varietal response to treatment application
12. Treatment effects on field burning requirements
13. Degree of biomass reduction
14. Effect of varying concentrations of nonionic surfactants or crop oils on efficacy
15. Effect on dicot weeds
16. Tank mixes with other plant growth regulators or pesticides
17. Effect of gallonage and spray pressure on efficacy
18. Evaluation of seed quality at harvest
19. Evaluation of yield parameters at harvest
20. Crop residue
21. Soil persistence

B. To evaluate the phytotoxicity of PARLAY at rates up to 4.0 lb ai/A (4 times the maximum proposed use rate). Such rates will only be used on small plots."

100.2 Formulation Information (excerpted from label)

*ACTIVE INGREDIENT	
(2 RS, 3 RS,) -1-(4-chlorophenyl)-4,4-dimethyl-2-(1H-1,2,4-triazol-1-yl)pentan-3-ol.....	50%
INERT INGREDIENT.....	50%
TOTAL.....	100%

100.3 Application Methods, Directions, Rates

*APPLICATION

This product must be used in accordance with the written recommendation provided by your ICI Americas Inc. representative.

Apply specified dosage per acre following seedhead initiation up to and including floret initiation. Best results are obtained at floret initiation. Rainfall or irrigation is required to induce activity. Applications should be timed to coincide with rainfall or irrigated within three to five days.

Grass Seed Crops to be Evaluated

<u>Crop</u>	<u>Broadcast Rate (lb ai/A)</u>	<u>Minimum Spray Volume (gal)</u>	
		<u>Ground</u>	<u>Air</u>
Chewing Fescue	0.125-1.0	5.0	1.0
Red Fescue			
Tall Fescue			
Bentgrass			
Orchardgrass			
Annual Ryegrass			
Perennial Ryegrass			
Kentucky Bluegrass			

REMARKS AND PRECAUTIONS

Preliminary results indicate that delayed rainfall, five to seven days following application will not reduce overall activity. If PARLAY is applied during periods of drought, results may be unsatisfactory.

Do not exceed 1.0 lb ai/A per year except for phytotoxicity testing at 4.0 lb ai/A (4X) per year.

Do not exceed two applications per year. Make second application 1 to 8 weeks after first application.

Do not graze treated fields or use any part of crop or crop waste for feed or bedding purposes.

Do not plant food or forage crops on treated land within eighteen months after application."

100.4 Target Organisms

There are no target organisms per se. This product is to control the growth of the crop.

100.5 Precautionary Labeling (excerpt from label)

*ENVIRONMENTAL HAZARDS

Do not contaminate water by cleaning equipment or disposal of wastes.

In case of a significant spill, call CHEMREC 800/424-9300."

101 Hazard Assessment

101.1 Discussion

This submission is a request for an experimental use permit for Parlay 50WP Plant Growth Regulator for use on ornamental and turf grasses grown for seed. This permit is requested for two years on 5,000 acres with an average application rate of 0.75 pounds of active ingredient (a.i.) per acre, thus, 7500 pounds of a.i. for use on 10,000 acres. As illustrated below the 5000 acres to be treated are distributed among 5 states the majority of which is in Oregon:

Parlay EUP Program

<u>Seed Crops</u>	<u>Method of Application</u>	<u>No. of Applications</u>	<u>Application Interval</u>	<u>Duration</u>		<u>Application Rates</u>
				<u>Begin</u>	<u>End</u>	
Timothy	Foliar Spray (ground, air)	2 max.	2-6 wks.	3/84	3/86	0.125 to 1.0 lb ai/A in phytotoxicity tests)
Chewing Fescue						
Red Fescue						
Tail Fescue						
Bentgrass						
Orchardgrass						
Annual Ryegrass						
Perennial Ryegrass						
Kentucky Bluegrass						

<u>States</u>	<u>Approximate No. of Trials per Year</u>	<u>Acres Required Per Year</u>	<u>Amount of Parlay Required per Year (lb ai)</u>
Oregon	110	3400	2550
Washington	15	600	450
Idaho	15	600	450
Minnesota	7	300	225
Missouri	3	100	75
Totals	150	5000	3750

101.2 Likelihood of Adverse Effects of Non-target Organisms

Exposure

The maximum expected concentrations expected on food items for terrestrial wildlife were estimated by use of the article of Hoerger and Kenaga (1972) and Kenaga (1973).

Residues in Food Items

<u>Vegetation Type/ Insect/Soil Surface</u>	<u>Residues from 1.0 lb a.i./A</u>
Sparse foliage (short grasses)	240 ppm
Long grasses	110 ppm
Leafy situations	125 ppm
Dense foliage/ small insects	58 ppm
Pods/seeds/large insects	12 ppm
Fruits	7 ppm
Soil (0.1 inch)	22 ppm

The estimated environmental concentrations (EEC) expected in 6" acre-layer of water are from both direct application and runoff were calculated as follows:

Formula:

$$EEC^1/(ppb) = \frac{A \text{ (pesticide loading to the body of water)}}{B \text{ (weight of the water)}}$$

A = maximum application rate (lbs a.i./A) x size of drainage basin (A) x % runoff (decimal)

B = surface area of body of water (A) x average depth (ft) x 43,560 ft²/A x 62.36 lbs/ft³

Therefore, if -- application rate = 1 lbs a.i./A

-- drainage basin = 1A

-- % runoff = 1 (100% for direct application)

-- surface area = 1A

-- average depth = 0.5 ft (6 inches)

$$\text{Then } EEC \text{ (ppb)} = \frac{1 \text{ lbs a.i./A} \times 1A \times 1 \text{ (direct application)}}{1A \times 0.5 \text{ ft} \times 43,560 \text{ ft}^2/A \times 62,36 \text{ lbs/ft}^3}$$

$$EEC \text{ (direct application)} = 736 \text{ ppb}$$

$$EEC \text{ (1\% runoff)} = 7.36 \text{ ppb}$$

Hence, the estimated concentration expected in water from runoff is 7.36 ppb. The concentration expected from spray drift would be some portion of the 736 ppb. Due to the low application height for turf, the interception by the turf, and volatilization of the spray. The distance of the drift would be expected to be minimal. Unless, the pond is extremely close to the application area. In view of this and the limited number of acres involved in this EUP, spray drift need not be further defined.

¹/This EEC method was devised by Dr. DeWitt of Patuxent Wildlife Research Center.

5

Terrestrial Wildlife

The hazard to terrestrial wildlife appears to be minimal. The dietary LC50 values for birds range from > 5000 mg/kg for Bobwhite Quail to > 20,000 mg/kg for Mallard Ducks. As shown above in the table of food items, the highest concentration expected is 240 ppm for short grass.

Since the diets of exposed avian populations would be expected to have some variety, the estimated dietary concentrations would be expected to be less than 240 ppm. Mammalian species are more sensitive. The oral LD50 for the mouse is 490 mg/kg as compared to the Mallard Duck value of > 7913 mg/kg. The estimated LC50 for the mouse is as follows:

Formula: $LC_{50} = \frac{\text{Mouse LD}_{50} / 5 \text{ day feeding period}}{\text{Portion of body weight consumed in food}}$

Assumptions:

- 1. Mouse LD50 = 490 mg/kg
- 2. Feeding period = .5 days
- 3. Food consumed/day = 3 grams
- 4. Mouse body weight = 20 grams

$LC_{50} = \frac{490 \text{ mg/kg} / 5 \text{ days}}{3 \text{ g. food consumed/day} / 20 \text{ g. body wt.}}$

LC50 = 653 ppm for the mouse

Comparing this concentration to the maximum expected residue of 240 ppm, it appears the minimum hazard is expected would be expected or mammalian species.

Aquatic Wildlife

Two sources of water contamination were identified in the above exposure section: spray drift and runoff. Due to the low application height for turf, minimal drift would be expected except where the turf and pond share the same border. Runoff contribution would also be expected to be minimal in light of the aquatic toxicity values of paclobutrazol. The bluegill and rainbow trout LC50 values were 23.6 and 27.8 mg/l, respectively.

Only the 48 hour LC50 Daphnia value, 33.2 ug/l, came near the EEC calculated for runoff. The runoff value of 7.36 ppb is less than 1/4th this invertebrate LC50. This margin would be expected to be adequate for this experimental use program.

101.3 Endangered Species Considerations

Minimal hazard is expected for endangered species. The turf grown for seed is not expected to be associated with endangered plants or animals.

101.4 Adequacy of Toxicity Data

All of the six basic studies have been submitted. The avian LD₅₀ did not meet the guideline requirements. Prior to registration this study will be required. In addition the environmental fate data is needed. Based on the environmental fate data, further chronic aquatic studies may be required.

102 Classification

Deferred in the above data is submitted.

103 Conclusions

EEB had completed the proposed experimental use permit risk assessment for the use of paclobutrazol on grass seed crops. Based upon the available data EEB concludes that the proposed use provides for a minimal risk to non-target organisms.

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