

US EPA ARCHIVE DOCUMENT

Registration
File

Shaughnessy #: 125601

Due Date: 05/24/85

Init: SM

MAY 13 1985

To: R. Taylor
Product Manager #25
Registration Division (TS-767C)

From: Joseph C. Reinert, Ph.D., Chief
Special Review Section
Exposure Assessment Branch
Hazard Evaluation Division (TS-769C)

Attached please find the EAB review of...

Reg./File No.: 538-ENN, ENR, ROO, ROT, ROI

Chemical: Paclobutrazol

Type Product: Plant Growth

Product Name:

Company Name: ICI

Submission Purpose: Exposure Assessment

ACTION CODE: 161

Date In: 4/24/85

EAB #: 5556-5560

Date Completed: 5/13/85

TAIS (level II)

Days

1

Deferrals To:

Ecological Effects Branch

Residue Chemistry Branch

Toxicology Branch

1.0 INTRODUCTION

An applicator exposure assessment was submitted by ICI Americas Inc. concerning the use of five Scotts turf products containing the active ingredient paclobutrazol. The five products are granular formulations containing 0.20 to 1.38% active ingredient. The application rates range from 0.2 lbs a.i./acre with Scotts Turf Manager and Turf Manager II to 0.88 lbs a.i./acre with Scotts ProTurf Growth Regulator Plus Fertilizer. ICI Americas calculated applicator exposure for use of Scotts ProTurf Growth Regulator Plus Fertilizer using two surrogate studies. The surrogate studies were Freeborg, RP, Daniel, WH, and Konopinski, VJ. (1985) Applicator Exposure to Pesticides Applied to Turfgrass. Dermal Exposure Related to Pesticide Use published by the American Chemical Society. pp 287-295. and Everhart, LP and Holt, RF. (1982) Potential Benlate Fungicide Exposure during Mixer/Loader Operations, Crop Harvest, and Home Use. J. Agric. Food Chem. 30(2):222-227. ICI Americas Inc. concluded from their assessment of the surrogate data that dermal exposure to paclobutrazol would be 66 ug/kg based on a 60 kg applicator and the maximum application rate.

2.0 EAB ASSESSMENT

The Exposure Assessment Branch has reviewed both surrogates and has determined that they are scientifically valid. (See Section 5.0-Note to the PM) The Everhart and Holt study was conducted with Benlate, a wettable powder. The use of a wettable powder as a surrogate for a granular formulation is not acceptable and EAB will not use Everhart and Holt in its assessment. Furthermore, Everhart and Holt did not measure applicator exposure for a turf application.

The Freeborg, Daniel, and Konopinski study is sufficient to estimate mixing/loading and application exposure. In this study the exposure of a worker to granular diazinon was assessed. Dermal exposure was measured by attaching absorbant pads under the clothing of the chest, back, thighs, and ankles. Pads were wrapped outside the clothing around each wrist. A personal air sampler measured respiratory exposure. Diazinon was applied by rotary spreader to a lawn at a rate of 5.5 lbs a.i./acre. The worker performed both loading and application functions with an exposure time of 34 minutes. The dermal exposure was as follows:

a) Chest	910 ug
b) Back	390 ug
c) Forearms	1100 ug
d) Lower Legs	290 ug
e) Thighs	9300 ug

Exposure to the hands was not measured. For the purpose of this assessment the wrist exposure of 0.87 ug/cm² will be considered

representative of hand exposure. Hand exposure is therefore estimated to be 710 ug.

Total Dermal Exposure = 12,700 ug

Respiratory Exposure = $0.20 \text{ ug/l} \times 29.1/\text{min} \times 34 \text{ min} = 200 \text{ ug}$

The exposure to diazinon for a 60 kg person is estimated to be $13 \text{ mg}/34 \text{ minutes} \times 60 \text{ minutes/hr} \div 60 \text{ kg} = 0.38 \text{ mg/kg/hr}$.

3.0 USAGE INFORMATION¹

Paclobutrazol is commonly applied to home lawns, golfcourse turf, and playing fields. Turf Manager, Turf Manager II, and Turf Manager for St. Augustinegrass are suggested for home lawn use. The labels recommend two applications per year. The maximum recommended application rates are 0.063 lbs a.i./5000 ft² for summer treatment and 0.042 lbs a.i./5000 ft² for spring or fall treatment when Turf Manager for St. Augustinegrass is used. The average home lawn size can be expected to range from 5000 to 10,000 ft² with application times of 20 to 30 minutes for granular drop spreaders. The application time for granular rotary spreaders would be less.

Turf Growth Regulator plus Fertilizer-Sandy Soils (SS) and Turf Growth Regulator plus Fertilizer-Loam and Clay Soils (LCS) are suggested for professional application to golfcourse and playing field turf. Three annual applications are recommended. The LCS product has the highest application rates at 0.59 lbs a.i./acre in the spring and fall and 0.88 lbs a.i./acre in the summer. Golf course fairways and tees are treated by a tractor-mounted rotary granular spreader with the treatment time required to cover a 40 acre fairway area being 4.4 to 5.0 hours.

Either a tractor-mounted rotary spreader or a manually pushed rotary spreader would be used to apply paclobutrazol to a ball field. The average ball field contains 1.5 acres of turf to which paclobutrazol can be applied in 30 minutes manually and 12 minutes by tractor equipment.

4.0 EXPOSURE TO PACLOBUTRAZOL

Home Lawn:

Turf Manager, Turf Manager II, and Turf Manager for St. Augustinegrass are the formulations recommended for home lawn use. The maximum recommended application rate is 0.063 lb a.i./5000 ft². Diazinon was applied at 5.5 lbs a.i./acre (0.63 lb a.i./5000 ft²) in the surrogate study. Therefore the conversion ratio is $(0.063 \text{ lb paclobutrazol}/5000 \text{ ft}^2 \div 0.63 \text{ lb diazinon}/5000 \text{ ft}^2) 0.10$. The daily exposure to the homeowner loading and applying paclobutrazol is estimated to be: $380 \text{ ug/kg/hr} \times 0.10 \times 0.5 \text{ hr/day} = 19 \text{ ug/kg/day}$.

It is possible for the homeowner to apply the LCS product at the maximum recommended application rate of 0.88 lbs/acre.

¹ Pelletier, EN. Use Practice Information for Exposure Analysis-Paclobutrazol, Growth Regulator for Turf. Memorandum dated 4/26/85.

The conversion ratio is (0.88 lbs paclobutrazol/acre ÷ 5.5 lbs diazinon/acre) 0.16. The daily exposure to the homeowner loading and applying the LCS product would be $380 \text{ ug/kg/hr} \times 0.16 \times 0.5 \text{ hr/day} = 30 \text{ ug/kg/day}$.

Golf Course:

The LCS formulation may be applied to fairways and tees at the maximum recommended rate of 0.88 lbs a.i./acre. The conversion ratio from the surrogate study is 0.16. The daily exposure to loading and application on the golf course is $380 \text{ ug/kg/hr} \times 0.16 \times 5.0 \text{ hr/day} = 300 \text{ ug/kg/day}$.

Ball Field:

The LCS formulation is again suggested. The daily exposure to loading and application on ball fields is $380 \text{ ug/kg/hr} \times 0.16 \times 0.5 \text{ hr/day} = 30 \text{ ug/kg/day}$.

5.0 NOTE TO THE PM

Henceforth it is the policy of the Exposure Assessment Branch not to accept or review exposure assessments carried out by registrants on the basis of surrogate exposure studies unless such analyses have been specifically requested by EAB. The registrant should be so informed.


Curt Lunchick, Chemist
Special Review Section
Exposure Assessment Branch
Hazard Evaluation Division (TS-769C)