8-28-86

159

Shaughnessy #: 128701

Date out of EAB: AUG 28 1986

Signature: for SMC

To: R. Mountfort
Product Manager # 23
Registration Division (TS-767)

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

JCR

Attached please find the EAB review of:

Reg./File No.: 8340-RI

Chemical: Fenoxaprop-ethyl

Type Product: Herbicide

Product Name: ACCLAIM

Company Name: Hoechst

Submission Purpose: Exposure Assessment

Date In: 24 March '86

Action Code: 121

Date Completed: 1 July '86

EAB # 6461

Monitoring Requested: _____

TAIS (level II) Days

Monitoring Voluntarily Done _____

2

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

_____ Benefits and Use Division

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

MAR 18 1986

Subject: Exposure to Whip Herbicide (Fenoxyprop-Ethyl)

To: Richard Mountfort
Registration Division (TS-767)

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

From: Harold R. Day, Chemist HRD
SRS, EAB, HED (TS-769)

Thru: Chief, SRS, EAB, HED (TS-769) JCR

As you requested we have provided a quick estimate for the exposure to Whip from its use on soybeans. This study was done for American Hoechst by Orius Associates, Inc.

The entire completed study was reviewed by Dynamac Corporation. They summarized the data. We are in the process of comparing the actual study with the Dynamac review. Preliminary indications are that the review is a good summary of the study.

We have therefore extracted some of the summary exposure data and tabulated it below as a preliminary indication of exposure. The Dynamac study is attached for reference.

Summary of Exposure to Whip*

Job Category	Hours/ Day	Exposure mg/hr** Inhalation	Exposure mg/hr** Dermal	Exposure mg/kg/day*** Inhalation	Exposure mg/kg/day*** Dermal
Mixer/Loader	0.5	0.005	7	0.00004	0.05
Applicator	6	0.002	0.2	0.0002	0.02

* Whip use per acre is only 0.2 lb ai/acre (maximum recommended rate). This is low compared to most herbicides and may account for the relatively low exposure.
**Data from pp. 8-9 of Dynamac Report. The dermal values are for hands which is the primary dermal exposure route. Whole body exposure (other than hands) was measured only on a whole day basis (result 0.005 mg-0.0001 mg/kg/day) and is not significant compared to hand exposure.
***This summary includes the following assumptions:
-70 kg person
-0.5 hour mixing time/day
-6 hours of spraying/day

These numbers used represent mean values; the range for dermal exposure in mg/hr is: mixer/loaders is 0.25-11.5, applicators 0.001-0.5.

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1.0 Introduction

American Hoechst Corporation is seeking to register Acclaim 1EC as a herbicide that controls grasses. The intended registered uses would be for sod farms, commercial and residential turf, and rights-of-way. The active ingredient in Acclaim is fenoxaprop-ethyl at a concentration of 1.0 lb per gallon.

It is being regulated as a teratogen. The exposure assessment for Acclaim will assume a 60 kg individual and will not be adjusted for the dermal absorption of fenoxaprop-ethyl. The exposure assessment will assume the use of no protective clothing since with the exception of eye protection, no protective clothing is required on the proposed labeling.

2.0 Usage Data

The Benefits and Use Division has provided data estimating the typical usage of Acclaim should it be registered (Keitt, G.W., Use Data for Exposure Analysis of Fenoxaprop-ethyl (Acclaim 1EC) on Turf, memorandum dated 30 May 1986). Acclaim would be applied to sod farms by ground boom tractor. Based on standard practices on sod farms, users of Acclaim would be expected to spray 20 acres a day over a four hour period. It is possible that 40 acres could be treated over a 8 hour period. The label application rates range from 0.12 to 0.35 lbs a.i./acre with 0.24 lbs a.i./acre estimated to be typical. Typically a total of (0.24 lbs a.i./acre x 20 acres/day) 4.8 lbs a.i. would be handled daily although a maximum of (0.35 lbs a.i./acre x 40 acres) 14 lbs a.i. may be handled.

The application of Acclaim to commercial turf would be done using back pack sprayers to small areas. In unusual situations large areas may need to be treated. In the situation a truck mounted hand held spray gun would be used. The back pack sprayer would typically treat 0.18 acres/day but could treat up to 0.3 acres/day. The typical application rate is 0.17 lbs a.i./acre with a maximum of 0.35 lbs a.i./acre. Under these usages a total of 0.031 lbs a.i. would typically be used daily but a maximum of 0.11 lbs a.i. is possible. The treatment of large areas would likely be at 0.24 lbs a.i./acre with 0.35 lbs ai./acre being the maximum. The treatment of 5 acres would require four hours. A total of 1.2 lbs a.i. would typically be handled with a maximum of 1.75 lbs a.i. possible.

Homeowners would use backpack sprayers for treatment of home lawns. Most individuals would treat under 3,000 ft^2 and generally the treatment would be spot treatment. The typical application rate would be 0.17 lbs a.i./acre to 0.03 acres with a maximum of 0.35 lbs a.i./acre to 0.09 acres. The homeowner would typically handle 0.0051 lbs a.i./day but could handle up to 0.034 lbs a.i./day.

The use of Acclaim to highway rights-of-way would occur at 0.12 to 0.35 lbs a.i./acre. The herbicide would be applied by a ground boom attached to a tank truck. A total of 80 acres would be treated a day based on a 33 mile long 20 foot strip. A total of 9.6 to 28 lbs a.i. would be used daily based on the 80 acres/day.

3.0 Surrogate Exposure Data

The British Agrochemicals Association Limited (BAAL) conducted a study on the application of 2,4-D to grassland (Spray Operator Safety Study, 1983, Alembic House, 93 Albert Embankment, London, SE1 7TU). During this study 2,4-D was applied by ground boom from open tractor cabs and by back pack spray. The dermal collection pads were placed exterior to a tyvek suit worn by the study participants. EAB has reduced the dermal exposure by 50% to body parts that would be covered by short sleeve shirts and long pants. The use of protective gloves is not assumed. The dermal exposures based on the BAAL study are presented in Table 1 for mixing/loading and Table 2 for application. The mixer/loader is estimated to receive and exposure of 5.5 mg/lb a.i. for large tank mixing/loading and 36 mg/lb a.i. for loading knapsack sprayers. The ground boom applicators received an exposure of 1.8 mg/lb a.i. and Knapsack sprayers received an exposure of 63 mg/lb a.i. sprayed.

4.0 Exposure to Acclaim

Daily Exposure to Acclaim is estimated as follows:

Sod Farms:

Typical - Mixer/loader: 5.5 mg/lb a.i. x 4.8 lbs a.i./day ÷ 60 kg = 0.44 mg/kg/day
Applicator: 1.8 mg/lb a.i. x 4.8 lbs a.i./day ÷ 60 kg = 0.14 mg/kg/day
Combined: 0.44 mg/kg/day + 0.14 mg/kg/day = 0.58 mg/kg/day

Maximum: Mixer/loader: 5.5 mg/lb a.i. x 14 lbs a.i./day ÷ 60 kg = 1.3 mg/kg/day
Applicator: 1.8 mg/lb a.i. x 14 lbs a.i./day ÷ 60 kg = 0.42 mg/kg/day
Combined: 1.3 mg/kg/day + 0.42 mg/kg/day = 1.7 mg/kg/day

Commercial Turf: Large Acreage

Typical - Mixer/loader: 5.5 mg/lb a.i. x 1.2 lbs a.i./day ÷ 60 kg = 0.11 mg/kg/day
Applicator: 63 mg/lb a.i. x 1.2 lbs a.i./day ÷ 60 kg = 1.3 mg/kg/day
Combined: 0.11 mg/kg/day + 1.3 mg/kg/day = 1.4 mg/kg/day

Maximum: Mixer/loader: 5.5 mg/lb a.i. x 1.75 lbs a.i./day ÷ 60 kg = 0.16 mg/kg/day
Applicator: 63 mg/lb a.i. x 1.75 lbs a.i./day ÷ 60 kg = 1.8 mg/kg/day
Combined: 0.16 mg/kg/day + 1.8 mg/kg/day = 2.0 mg/kg/day

Commercial Turf: Small Acreage

Typical - Mixer/loader: 36 mg/lb a.i. x 0.031 lbs a.i./day ÷ 60 kg = 0.019 mg/kg/day
Applicator: 63 mg/lb a.i. x 0.031 lbs a.i./day ÷ 60 kg = 0.033 mg/kg/day
Combined: 0.019 mg/kg/day + 0.033 mg/kg/day = 0.052 mg/kg/day

Maximum: Mixer/loader: 36 mg/lb a.i. x 0.11 lbs a.i./day ÷ 60 kg = 0.066 mg/kg/day
Applicator: 63 mg/lb a.i. x 0.11 lbs a.i./day ÷ 60 kg = 0.12 mg/kg/day
Combined: 0.066 mg/kg/day + 0.12 mg/kg/day = 0.19 mg/kg/day

Homeowner:

Typical - Mixer/loader: 36 mg/lb a.i. x 0.0051 lbs a.i./day ÷ 60 kg = 0.0031 mg/kg/day
Applicator: 63 mg/lb a.i. x 0.0051 lbs a.i./day ÷ 60 kg = 0.0054 mg/kg/day
Combined: 0.0031 mg/kg/day + 0.0054 mg/kg/day = 0.0085 mg/kg/day

Maximum: Mixer/loader: 36 mg/lb a.i. x 0.034 lbs a.i./day ÷ 60 kg = 0.020 mg/kg/day
Applicator: 63 mg/lb a.i. x 0.034 lbs a.i./day ÷ 60 kg = 0.036 mg/kg/day
Combined: 0.020 mg/kg/day + 0.036 mg/kg/day = 0.056 mg/kg/day

Rights-of-way:

Typical - Mixer/loader: 5.5 mg/lb a.i. x 9.6 lbs a.i./day ÷ 60 kg = 0.88 mg/kg/day
Applicator: 1.8 mg/lb a.i. x 9.6 lbs a.i./day ÷ 60 kg = 0.29 mg/kg/day
Combined: 0.88 mg/kg/day + 0.29 mg/kg/day = 1.2 mg/kg/day

Maximum: Mixer/loader: 5.5 mg/lb a.i. x 28 lbs a.i./day ÷ 60 kg = 2.6 mg/kg/day
Applicator: 1.8 mg/lb a.i. x 28 lbs a.i./day ÷ 60 kg = 0.84 mg/kg/day
Combined: 2.6 mg/kg/day + 0.84 mg/kg/day = 3.4 mg/kg/day

5.0 Discussion

I have reviewed the proposed label language for Acclaim and am concerned about some of the intended uses. The hazard section of the label states that Acclaim "may cause substantial but temporary eye injury." Goggles or a face shield are required. I question the granting of the registration of this product for home use. Home owners generally are not properly trained in the safe handling of pesticides and would not be expected to own face shields or goggles. I believe home owner use of this product will lead to incidences of substantial eye injury. I strongly recommend not registering this product for home use. I also would require the use of protective gloves during mixing and loading of the concentrate.

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

Table 1. Mixer/Loader Exposure to 2,4-D

Body Part	Dermal Exposure (mg/operation) Tank Mixer (n=18)	Loading Knapsack (n=8)
Front Torso	1.4	0.21
Back Torso	0.15	0.12
Arms	7.5	0.35
Hands	135	9.8
Thighs	1.8	0.22
Lower Legs	3.2	0.32
Total Exposure	149	11
Lbs a.i. handled	27	0.31
Exposure (mg/lb a.i.)	5.5	36

Table 2. Applicator Exposure to 2,4-D

Body Part	Dermal Exposure (ug/g 2,4-D applied) Ground Boom (n=18)	Knapsack (n=12)
Head	0.041	2.3
Front Torso	0.059	1.4
Back Torso	0.030	2.2
Arms	0.34	2.0
Hands	3.2	44
Thighs	0.10	8.3
Lower Legs	0.19	78
Total (ug/g applied)	3.96	138
Total (mg/lb a.i. applied)	1.8	63