

US EPA ARCHIVE DOCUMENT

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

14 JUL 1989

OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: EXPOSURE ASSESSMENT FOR THE APPLICATION OF ATRAZINE TO SORGHUM

TO: J. Andreasen  
Special Review Branch  
Special Review and Reregistration Division (H7505C)

FROM: Curt Lunchick *Curt Lunchick*  
Environmental Chemistry Review Section  
Non-Dietary Exposure Branch  
Health Effects Division (H7509C)

THRU: *Al Nielsen Jr*  
Michael Firestone, Section Head  
Environmental Chemistry Review Section  
Non-Dietary Exposure Branch  
Health Effects Division (H7509C)

THRU: Charles L. Trichilo, PhD., Chief  
Non-Dietary Exposure Branch  
Health Effects Division (H7509C)

Please find below the NDEB review of ....

HED Project #: 9-1762

RD or SRRD Record #: 247831

Caswell #: 63

Date Received: 07/12/89 Review Time: 2 days

Date Returned: 07/14/89

Deferral to: Biological Analysis Branch/BEAD

X Science Analysis & Coordination Branch

X TB - Insecticide/Rodenticide Support Section

       TB - Herbicide/Fungicide/Antimicrobial Support Section

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As per your request, the Non-Dietary Exposure Branch has conducted an exposure assessment for the use of atrazine on sorghum. Based on usage information provided by the Biological Analysis Branch/BEAD (Use Data for Exposure Analysis for the Application of Atrazine to Sorghum, Dennis Szuhay, 3 July 1989), atrazine may be applied to sorghum by ground boom application at 1.6 to 3.0 lbs a.i./acre. One application per year may occur to treated acreage. The average boom width is 30 ft and the typical acreage for sorghum is 135 acres per farm. BEAD estimated that 107 acres would be the typical daily acreage treated and would require 5.9 hours. The time required to treat 135 acres would be 7.4 hours and would be spread over two days. Based on the average application rate of 2.0 lbs a.i./acre, a mixer/loader would handle 214 lbs a.i./day and 270 lbs. a.i./yr.

The Non-Dietary Exposure Branch conducted an exposure assessment for ground boom application of atrazine to corn in January 1988 (EAB# 80077). Surrogate data were utilized in that assessment and as described the dermal exposure to mixer/loaders wearing long pants, long sleeved shirts, and chemical resistant gloves was estimated to be 0.93 mg/lb a.i. for open pour loading. Ground boom applicator dermal exposure was estimated to average 4.6 mg/hr at an application rate of 1.0 lbs a.i./acre. The applicator was assumed to be wearing long pants and long sleeved shirts. Inhalation exposure is negligible compared to dermal exposure.

Daily dermal exposure during mixing and loading would be:  
 $0.93 \text{ mg/lb a.i.} \times 214 \text{ lb a.i./day} \times 1/70 \text{ kg} = 2.8 \text{ mg/kg/day}$

Annual dermal exposure during mixing and loading would be:  
 $0.93 \text{ mg/lb a.i.} \times 270 \text{ lb a.i./yr} \times 1/70 \text{ kg} = 3.6 \text{ mg/kg/yr}$

The average daily exposure during application would be:  
 $4.6 \text{ mg/hr} \times 2 \times 5.9 \text{ hrs/day} \times 1/70 \text{ kg} = 0.78 \text{ mg/kg/day}$

The average annual exposure during application would be:  
 $4.6 \text{ mg/hr} \times 2 \times 7.4 \text{ hrs/yr} \times 1/70 \text{ kg} = 0.97 \text{ mg/kg/yr}$

Typically the private farmer will do both the mixing/loading and application of atrazine to sorghum. The combined daily and annual exposure to atrazine are estimated to be 3.6 mg/kg/day and 4.6 mg/kg/yr. The exposure estimates assume a 70 kg individual and have not been adjusted for dermal absorption. NDEB defers to Toxicology Branch I the adjustment of the dermal exposure estimates for the dermal absorption of atrazine.

cc: M. Copley/TB I  
E. Saito/SACB  
Correspondence File  
Atrazine File