

US EPA ARCHIVE DOCUMENT

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To:

Product Manager # 16 (W. Miller)
Registration Division (TS-767)

From:

Joseph C. Reinert, Ph.D., Chief
Special Review Section 2
Exposure Assessment Branch
Hazard Evaluation Division (TS-769c)

Attached please find the EAB review of...

Reg./File No.: 241-238

Chemical: Terbufos

Type Product: Insecticide/Nematocide

Product Name: Counter

Company Name: American Cyanamid

Submission Purpose: Worker Exposure Study to Support Aerial Application
of Counter to Field Corn

ZBB Code: _____

ACTION CODE: 336

Date In: 3/18/85

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Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

4 pages

Assessment of American Cyanamid Farm Worker Exposure Study
to Terbufos (Counter 15 G) Applied Aerially to Field Corn

Introduction

Counter 15G (15G) is the trade name for a terbufos formulation produced by American Cyanamid Company. It is a granular formulation for application to field corn to control spider mites and the European corn borer. It functions as a systemic insecticide/nematocide. The registrant has submitted an exposure study (Project No 0402) to determine farmworker exposure from the aerial application of 15G.

It is applied to field corn at the rate of 6.7 lbs/acre (1 lb AI/acre). The 15G is incorporated in [REDACTED]

Use

Various workers were monitored for exposure during and after application. Respiratory and dermal exposure was estimated as well as blood and urine measurements. Additionally, granule drift and dislodgeable residues were determined. This report will address only the respiratory and dermal exposure.

Workers Monitored

The workers and their job functions and exposure times are summarized in the the following Table.

Function	Number	Time Exposed (minutes)	Number of Replicates
Flagger	1	15	1
Loader	1	5	1
Scout	3	30	2*

*NOT a true replicate; represents exposure at 3 and 7 days post application.

Dermal Exposure

Each person wore 12 patches--six inside and six outside (not overlapping) at the following locations: chest, back, leg calf, one thigh, one forearm, and one upper arm. Following exposure, the patches were frozen and sent to American Cyanamid for analysis. The patch size was 40.3 square cm.

INERT INGREDIENT INFORMATION IS NOT INCLUDED

Inhalation Exposure

Each worker was monitored for respiratory exposure by pulling air in a worker's breathing zone through a resin-filled trapping tube with the aid of an a monitoring pump. The sample (tubes) were frozen and later extracted at American Cyanamid laboratories.

Urine Sampling

The persons exposed were monitored for 15G residues in their urine which was collected periodically. The urine was also analyzed for creatinine which gives a good indication of daily urine output of the individuals monitored.

Blood Collection

Worker's blood was monitored for decreased cholinesterase activity.

Hand Exposure

Hand exposure was monitored by a 200 ml (each hand) wash with ethanol following the exposure period.

Wind Drift/Granule Distribution

Suspended pads (in potential drift area), ground pans in the crop area, and corn leaf samples were used to measure aerial drift in the application area.

Analytical Methods

The residues on the pads and other samples were analyzed by gas chromatography using a flame photometric detector. The sensitivity of the method is in the nanogram range.

Results

1. Ground pan placed between cotton rows yielded an average of 13 ug/square cm.
2. Pads placed 50 ft. from the crop edge yielded 0.05 ug/square cm.
3. All the resin-filled tubes showed no detectible 15G indicating no exposure (see conclusion section).

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4. The registrant claims total average exposure values for the persons monitored were:

Dermal Exposure

Flagger--0

Loader --331 ug/hr

Scout

3 days post treatment--381 ug/hr

7 days post treatment--250 ug/hr

Inhalation Exposure

Nondetectible for all samples.

Conclusions

1. This study is invalid with respect to inhalation exposure for all subjects and dermal exposure for the flagger and loader (see reasons below).

2. The flagger was in an enclosed vehicle during the flagging activity and was not really exposed to 15G. When this fact is considered, it is not surprising that they found zero residues. Also, the exposure time (15 min.) and number of replicates (1), is insufficient to draw a reliable exposure conclusions.

3. The loader activity was only five (5) minute duration and only one replicate was done. No inhalation exposure was noted which is probably due to insufficient volume of air sampling during the mixing activity. The highest volume of air sampled was 45 liters (scouts) which represents only 4.5% of the breathing rate (1 cubic meter/hr). A five minute exposure and one replicate is insufficient to judge dermal exposure in this situation.

4. The dermal scout exposure values are probably valid. The results are similar to data tabulated by Wolfe (1967) were a scout checking for cotton damage received 0.7 mg/hr exposure after treatment with parathion. This is similar to the 0.4 and 0.3 mg/hr found in this study. Insufficient air was sampled to provide an estimate of respiratory exposure; therefore inhalation measurements for scouts ~~in~~ invalid.

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