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SCIENTIFIC SERVICES

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

AUG 3 1992

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

MEMORANDUM

SUBJECT: IN-DEPTH REVIEW OF POSTAPPLICATION/REENTRY STUDY UNDER
SUBDIVISION K GUIDELINE REQUIREMENTS TO SUPPORT THE
REREGISTRATION OF LINURON-E.I. DUPONT DENEMOURS AND
COMPANY, INC. (HED Project #1-2342)

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Please find the OREB review of

DP Barcode: D168658

Pesticide Chemical Code: 035506

EPA Req. No.: N/A

EPA MRID No.: 403418-01

Review Time: 5 Days

PHED: No

1.0 INTRODUCTION

OREB has reviewed the study "Exposure of Asparagus Harvesters to Lorox (linuron) Herbicide in California, 1986" [MRID 403418-01] conducted by Orius Associates, Inc. on behalf of E.I. Dupont DeNemours and Co. Inc. Linuron is an herbicide registered for use on terrestrial food and non-food crops to control broadleaf weeds and annual grasses. Linuron is primarily applied as a preemergent or postemergent directed spray, and can be applied to actively growing asparagus spears. When harvesting, workers use knives to cut the asparagus spear slightly below the soil surface. As a result, the asparagus harvester is exposed to linuron treated soil and spears. Linuron is a Group C carcinogen with a potency of 1.8×10^{-4} . Other asparagus harvesting personnel exposed to residues of linuron are sledders and off-loaders. Sledders pick-up bunches of asparagus spears cut by the harvesters and load them onto slow moving tractors. Off-loaders unload the bunches of asparagus by hand from the tractors onto conveyors for packaging.

One to 4 treatments of linuron at the rate of 1 to 2 pounds active ingredient (ai) per acre can be applied before the cutting season or after a cutting (EPA Reg. No. 352-270). The cutting period for asparagus ranges from 2 to 12 weeks depending on the age and vigor of the asparagus plantings. In the beginning of the cutting season, asparagus spears may only require cutting once every 3 days increasing to twice a day as growth becomes more active later in the season. An interim 24 hour reentry interval was established in the Registration Standard for linuron.

The data requirements delineated in the Registration Standard include postapplication/reentry data and mixer/loader/applicator data. The mixer/loader/applicator exposure was addressed during the Special Review for linuron. The study conducted by Orius and submitted by DuPont was designed to address postapplication/reentry worker exposure under Subdivision K guideline numbers 132-1a (foliar dissipation), 132-1b (soil dissipation), 133-3 (dermal exposure), and 133-4 (inhalation exposure).

2.0 CONCLUSIONS/RECOMMENDATIONS

Cool, rainy weather caused this study to be concluded after only 3 sampling periods, Day 0, Day 1, and Day 3 posttreatment. As a result of the short sampling period, a dissipation curve could not be established. Furthermore, the inhalation monitoring equipment and subsequent inhalation exposure data were compromised by contamination and poor weather (high winds which created a dusty environment prior to the onset of the cool, rainy weather). These data alone cannot be used to establish a reentry interval or support the reregistration of linuron. However, the

minimal foliar dissipation, soil dissipation, and dermal exposure data that were provided are scientifically sound and are considered supplementary. Additional study deficiencies are noted as follows:

- 1) An Allowable Exposure Level (AEL) was not established nor was a reentry interval proposed;
- 2) Samples were not collected prior to the application of linuron. This is particularly important since the test area, and an area used as a control plot, had been treated with linuron at the rate of 1 lb ai 14 days prior to the study application;
- 3) Soil and foliar residue data were reported in parts per million (ppm) rather than $\mu\text{g}/\text{cm}^2$ as specified in Subdivision K;
- 4) Dislodgeable residue data and worker exposure data were contradictory. Dislodgeable residues increased from day 0 to day 1 then slightly declined on day 3 while the exposure data showed a rapid rate of decline for the same period;
- 5) Complete meteorological data were not provided (although some weather conditions were noted in the field log book);
- 6) Low recovery values (55% - 74%) were reported for all exposure monitoring samples spiked in the field;
- 7) Subdivision K specifies monitoring at least 10 workers per activity. In this study, only 9 harvesters, 3 sledders, and 3 off-loaders were monitored. In addition, the off-loaders did not handle asparagus from the 0-Day plot; but rather the control plot which had been treated at only one 1 lb ai/A, 14 days prior;
- 8) The maximum labeled rate of 4 applications of 2 lb ai/A were not applied to the test plots.

To establish a reentry interval and to support the reregistration of linuron the following data are required:

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132-1a	Foliar Dissipation (asparagus)
132-1b	Soil Dissipation (asparagus)
133-3	Dermal Exposure (asparagus)
133-4	Inhalation Exposure (asparagus)

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Correspondence File
Chemical File (Linuron)
Circulation