4/25/85

Shaughnessy #: 059101

Date out of EAB: 4/24/85

Signature: [signature]

APR 25 1985

To: Jay Ellenberger
Product Manager # 12
Registration Division (TS-767)

From: John Jordan, Acting Section Chief
Registration Standards, Section #3
Exposure Assessment Branch
Hazard Evaluation Division (TS-769c)

Attached please find the EAB review of:

Reg./File No.: 464-404

Chemical: Chlorpyrifos

Type Product: I

Product Name:

Company Name:

Submission Purpose: Response to Registration Standard -
Rotational Crop Studies - Action 660

ZBB Code: _____ ACTION CODE: 660

Date In : 2/26/85 EAB # 5353

Date Completed: _____ TAIS (level II) Days

Deferrals To: 42 3

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

Materials and Methods

^{14}C-chlorpyrifos (0,0 diethyl O-(3,5,6 trichloro-2-pyridinyl) phosphorothioate), ring labelled, was added to a field plot of Londo sandy loam (1.9% om, 70% sand, 14% clay, 16% silt pH 6.5) by a dropping pipette at a rate of 5 lb ai/acre. It was incorporated to a depth of 1 inch. Rotational crop studies were conducted in the field 30 days, and on a wheat subplot at 365 days after addition. A growth chamber study was also conducted 126 days after compound addition using the top 6 inches of soil which had been removed from the field and placed in steel drums. Crops used at 30 days were lettuce, spinach, turnip and wheat; at 120 days lettuce soybean sugarbeet and wheat and at 365 days only wheat. Values were reported at several times post planting for foliage only in lettuce and spinach; for foliage and root in turnip and sugar beet; for foliage and bean in soybean, and foliage (30 days only) grain and straw in wheat. Studies also included measurements on total chlorpyrifos related residue for known and unsuspected metabolites and soil analyses for ^{14}C residues of chlorpyrifos.

Analyses for total plant soil and insoluble plant ^{14}C activity were by combustion and counting. Soluble plant and soil samples were analyzed via HPLC with a UV detector and for ^{14}C by use of a Gilson fraction collector and counted to construct a histogram. Crop residues were identified by extraction using ACR 71.19P.S6 validated total residue method followed by GC-EC analysis and by counting for ^{14}C activity.

Soil extraction technique used as described by Bidlack, 1979, involves extracting chlorpyrifos and residues from an Aldrich, acidic soil slurry with diethyl ether followed by concentration. Analyses by HPLC and counting for total ^{14}C activity.

Conclusions

1. Study is scientifically valid and follows EPA recommended guidelines for confined accumulation studies on rotational crops.

2. Levels of chlorpyrifos as determined by ^{14}C, in lettuce ranged from a high of 0.57 ppm in 30 day post application foliage (sampled 33 post planting) down to 0.05 ppm in 129 day foliage. Spinach foliage 30 day levels were 0.22 - 0.27 ppm; the 30 day turnip foliage ranged from 0.29 to 0.08 ppm; 129 day soybean sampled 119 days after planting had a foliage level of 0.36 ppm and ranged down to 0.17 ppm at 59 days post-planting.

3. Wheat was the only crop planted at all three times (30, 129 and 365 days) post application. Levels in wheat grain ranged from 0.42 ppm (planted 30 days post-treatment, sampled 124 days post-planting) down to 0.08 ppm in samples planted 1 year post treatment and sampled 93 days post planting.

4. Wheat straw values were the highest reported in this study at 1.95 ppm in the 129 day study sampled 73 days post-planting. Levels in the 30 day study were 1.78 ppm, 124 days, post planting. In the 365 day study sampled at 93 days post-planting, levels were down to 0.08ppm. The explaination given for the levels in the 30 and 129 day studies is that dehydration of the wheat plant occurs as it matures and increases the apparent ^{14}C concentration in this portion of the plant.

5. Soil analyses during the study indicate that the level of residual chlorpyrifos decreased during each growth period in the studies.

6. The registrant has fullfilled EPA guidelines 165-1 on rotational crops with this study showing little residual chlorpyrifos in crops or soils after applying it at the recommended rates on a sandy loam soil.

Paul J. Waterhouse

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