Shaughnessy No.: 128201

Date Out of EAB: 26 JAN 1984

To: Robert Taylor
Product Manager 25
Registration Division (TS-767)

From: Samuel Creeger, Chief
Review Section #1
Exposure Assessment Branch
Hazard Evaluation Division (TS-769)

Attached, please find the EAB review of...

Reg./File # : 352-EUP-RRL

Chemical Name: Ethyl-2-[(4-(6-chloro-2-quinoxalyloxy)phenoxy]proprionate

Type Product : Herbicide

Product Name : DPX-Y6202

Company Name : E.I. DuPont de Nemours and Company

Purpose : Data to support EUP:use on soybeans

ZBB Code : 3(c)(5)

EAB #(s) : 4067

Action Code(s): 710

TAIS Code: 63

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Deferrals to:

____ Ecological Effects Branch

____ Residue Chemistry Branch

____ Toxicology Branch

1.0 INTRODUCTION

On 7/19/83, EAB completed its initial review of data submitted to support the EUP use of the herbicide DPX-T6202 (Ethyl-2-[(4-(6-chloro-2-quinoxalyloxy)phenoxy]proprionate) on fallow land. At that time, data were insufficient to support the proposed use. Additionally, no response to the specified deficiencies has been submitted for EAB review.

The current submission contains additional data, in support of an additional use on soybeans.

2.0 STRUCTURE

See previous review.

3.0 DIRECTIONS FOR USE

The proposed directions for use are appended to this review.

4.0 EXPERIMENTAL PROGRAM

The proposed testing program is appended to this review. Briefly, the registrant proposes to apply a total of 2,500 lbs ai to a total of 10,000 acres in 27 states. The EUP will run for two years (May 1, 1984 thru December 31, 1985).

5.0 REVIEW OF DATA

5.1 Cadwagen, G.E. Jr. 1983. Hydrolysis of [^{14}C]-Quinoxaline-Labeled DPX-Y6202. Document No. AMR-151-83. E.I. du Pont de Nemours and Company, Inc. Agricultural Chemicals Department, Experimental Station, Wilmington, Delaware 19898. 8 pages, 2 tables, 3 figures, no references.

Introduction

This study appears to be supplementary to that evaluated in the review of 7/19/83.

Experimental

Experimental conditions were virtually the same as in the earlier study. Specific activity of the quinoxaline-labeled DPX-Y6202 was 19.3 uCi/mg.

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Results and Discussion

The major (and only significant) hydrolytic product was the de-esterified acid of DPX-Y6202. Statistical evaluation of the reported data yielded halflives of 2 days @ pH9, 30 days @ pH7 and >600 days @ pH5. Material balance was very reasonable.

Conclusions

The study is acceptable, and satisfies the hydrolysis data requirement.

5.2 Cadwagen, G.E. Jr. 1983. Aerobic Soil Metabolism of ^{14}C DPX-Y6202 (four month report). Document No. AMR-146-83. E.I. du Pont de Nemours and Company, Inc. Agricultural Chemicals Department, Experimental Station, Wilmington, Delaware 19898. 11 pages, 4 tables, 15 figures, no references.

Introduction

An anonymous Aerobic Soil Metabolism study was previously submitted and found to be unacceptable due to multiple deficiencies. To date, no specific response to these deficiencies has been received by EAB for review.

The current submission is presumably intended to replace this former report.

Experimental

Two soils were used in this study; a Flanagan silt loam and a Woodstown sandy loam. Soil characteristics are summarized in table 1, appended to this review.

Two standards in acetone with ^{14}C-quinoxaline-labeled DPX-T6202 (specific activity 29 uCi/mg, radiopurity 99%) were prepared to final concentrations of 5 and 50 ppm. The 50 ppm standard consisted of 80% unlabeled parent.

Of the 40 biometer flasks used (20 and 20 containing 50 gm of soil each), 4 were sterilized, 8 treated with 1 ml of the 0.1 ppm standard (approximating a 0.1 application rate)(sic) and 8 treated with 1 ml of the 1.0 ppm standard (approximating a 1.0 ppm application rate)(sic).

All flasks were amended with either 13 ml water (Flanagan) or 7 ml water (Woodstown) to bring soils to 70% moisture holding capacity (no reference to 1/3 bar). Each side arm was filled with 0.1N NaOH to trap evolving radio-CO_2 and the flasks placed in a dark incubator held at 25°C. Flasks were aerated every 10 days with a stream of O_2.

One additional nonsterilized aliquot of each soil was treated with ^{14}C-cellulose to confirm organism viability.

Aliquots of soil and alkali were taken at intervals and analyzed by multiple solvent extraction with LSC quantification. Extract components were isolated by TLC/radioautography. Spots were scraped from the plate and individually quantified by LSC.

Remaining exhaustively extracted soils were subjected to combustion and LSC to quantify any still-bound residual radioactivity.

Results and Discussion

Reported data are summarized in tables 2-4, appended to this review. The initial primary degradation product was DPX-Y6202 acid. Additionally, phenols 1 and 2 (see table 2, appended) were identified, although neither was found to exceed 10% of the applied parent.

Statistical analysis of the reported data confirmed soil half-lives for parent DPX-Y6202 of about 5 weeks in the Flanagan soil and about 3 to 6 weeks in the Woodstown. With the exception of the 0.1 ppm Woodstown experiment, all of the reported data were statistically unreliable. Specifically, the reported data were insufficient to reliably estimate the rate of decline of parent compound, as well as the rate of formation and decline of the major (acid) degradate - see § 162-1 (c)(2)(v) and (vii), and (d)(2),(5) and (7), in Pesticide Assessment Guidelines - Subdivision N, for specific data requirements.

Conclusion

This study is unacceptable.

Recommendation

Since the study is reportedly a "four month report", perhaps an evaluation of the remaining (as yet unsubmitted) data would enhance the reliability of the study. The registrant should consider this option, if appropriate.

5.3 Hutton, David G. and D.J. Kasprcak 1983. Residue Studies with ^{14}C-Quinoxaline-Labeled DPX-Y6202 in Bluegill Sunfish. Document No. AMR-155-83. E.I. du Pont de Nemours and Company. Haskell Laboratory of Toxicology and Industrial Medicine. Newark, Delaware 19711. 27 pages, 6 tables, 14 figures, 2 references.

Introduction

The accumulation of radio-DPX-Y6202 in Bluegill Sunfish was studied.

Experimental

This experiment was conducted utilizing 4-57 liter aquaria, each filled with 30 L fresh well water. Water temperatures were controlled at 22°C +/- 1°C, within the pH range 6.9 to 7.6. Dissolved O_2 was monitored, and maintained between 7.9 and 8.8 mg/L. Treatments of each were as follows:

Aquarium	Treatment
#1	0.004 mg/L ^{14}C-DPX-T6202*
#2	0.04 mg/L ^{14}C-DPX-T6202**
#3	0.05 mg/L dimethyl formamide solvent control
#4	undosed - clean water control

* Specific activity 39.9 uCi/mg, 99.6% radiopure
** Specific activity 3.992 uCi/mg, 99.6% radiopure

A total of 70 bluegill sunfish weighing 1.4 +/- 0.6 grams each were acclimated in the laboratory environment for about 34 days prior to initiation of the study. Water circulation in the tanks was started four days before the fish were introduced, to assure correct operation of the system and predictable analyte levels. The turnover rate was six times per day.

Four untreated fish were taken on day 0. Thereafter, four fish and a 100 ml aliquot of water were taken from each of the experimental tanks (#1 & #2) on days 1, 3, 7, 14, 21 and 28. On day 28, an additional 10 fish were taken for metabolite identification. At that time, the remaining fish were transferred to the untreated tanks for a 14 day period of depuration, with samples taken on days 1, 3, 7, 10 and 14 post transfer.

Overall fish mortality was very low. Two died in the water control, one in the low exposure and two in the high exposure.

Water samples were analyzed by LSC. Fish were carefully dissected into edible and inedible portions, then subjected to multiple solvent extractions. Quantification was by combustion and LSC. Metabolite identification was by TLC/cochromatography with known standards and integration by TLC-linear analyzer under UV.

Results and Discussion

The reported data are summarized in tables I, IV and V, appended to this review. Total bioconcentration in edible portions (muscle) peaked at 16x and 10x on days 1 and 7 for the 0.004 and 0.04 mg/L experiments. The 28 day values were 1x and 4x, respectively. The 14 day depuration values were both 0.3x.

Conclusions

This study was thoroughly done, and is acceptable in support of the accumulation in fish data requirement.

6.0 EXECUTIVE SUMMARY

Data requirements to support the proposed EUP include hydrolysis, aerobic soil metabolism, and accumulation in rotated crops and fish.

As of this review, submitted studies on hydrolysis and accumulation in fish have been found acceptable. Two previous aerobic soil metabolism studies were found inadequate to satisfy that data requirement. No studies have been received in support of the rotational crop data requirement.

7.0 CONCLUSIONS

Insufficient data have been submitted to support the proposed EUP use on soybeans.

8.0 RECOMMENDATIONS

If the registrant does not wish to submit the appropriate studies in support of the rotational crop data requirement, then the label should bear an 18 month rotational interval or equivalent crop destruct statement.

The registrant should be requested to submit additional data in support of the unsatisfied aerobic soil metabolism data requirement. For example, the submission of additional sampling data (say for a longer period of time) may allow more reliably prediction of the rate of degradation of parent, as well as the rate of formation and decline of the major degradates.

Alternatively, the registrant may choose to rebut the assumption that first-order kinetics accurately reflect the kinetics of this particular degradation.

Emil Regelman,
Chemist EAB/HED
January 25, 1984

Assure exposure assessment review

Page _____ is not included in this copy.

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