Shaughnessy No.:128201

Date Out of EAB: MAR 5 1985

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-112, -114 and -115

Chemical Name: DPX Y6202

Type Product : Herbicide

Product Name : Assure

Company Name : DuPont

Purpose : Data to support EUP use on Fallow Land, Cotton and Soybeans

Action Code(s): 710/714

EAB #(s) : 5215-17

Date Received: 12/20/84

TAIS Code: 52

Date Completed: 3/6/85

Total Reviewing Time: 1.7 days

Deferrals to:

____ Ecological Effects Branch

____ Residue Chemistry Branch

____ Toxicology Branch

1. CHEMICAL: DPX Y6202, Ethyl 2-[4-(6-chloroquinozalin-2-yloxy)-phenoxy] propanoate, DuPont ASSURE® Herbicide

2. TEST MATERIAL: ^{14}C-quinoxaline-labeled DPX Y6202

3. STUDY/ACTION TYPE: Aerobic Soil Metabolism

4. STUDY IDENTIFICATION:

Cadwgan, Gordon E. 1984. Aerobic Soil Metabolism of [^{14}C-quinoxaline-Labeled]-DPX-Y6202. Document No. AMR-200-84, Revision No. 1. (Company Confidential), Research Division, Agricultural Chemicals Department, E.I. duPont de Nemours. August 15, 1984. 15 pp, 10 tables, 19 figures. No references.

5. REVIEWED BY:

Typed Name : Emil Regelman
Title : Chemist
Organization: EAB/HED/OPP

Signature: Emil Regelman
Date: 3/5/85

6. APPROVED BY:

Typed Name : Samuel Creeger
Title : Chief
Organization: Review Section #1
EAB/HED/OPP

Signature: Clinton Fletcher for
Date: MAR 5 1985

7. CONCLUSIONS:

7.1 EAB cannot concur with the proposed EUP at this time.

7.2 The submitted aerobic soil metabolism study was apparently conducted in a thorough and technically accurate manner. However, the reported data show extremely poor correlation, suggesting inadequate recovery procedures.

Since the rate of decline of parent, as well as the rate of formation and decline of the major degradates has not been established, this study cannot be accepted in support of the aerobic soil metabolism data reqirement.

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8. RECOMMENDATIONS:

Unless the registrant can significantly enhance the reported data (e.g. by reextraction and reanalysis of frozen soil and other media), or otherwise justify the low correlation of the data, this study may have to be repeated. It is suggested that the registrant explore fitting the data to biphasic degradation.

9. BACKGROUND:

A. Introduction

In the EAB review of 1/26/84, a 4-month interim report on Aerobic Soil metabolism (Document No. AMR-146-83) was reviewed, and found deficient.

The current submission contains data from that previous study along with additional information to support the proposed EUP use on fallow land, cotton and soybeans.

B. Directions for Use

See previous reviews.

10. DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

A. Study Identification

Cadwgan, Gordon E. 1984. Aerobic Soil Metabolism of [^{14}C-quinoxaline-Labeled]-DPX-Y6202. Document No. AMR-200-84, Revision No. 1. (Company Confidential), Research Division, Agricultural Chemicals Department, E.I. duPont de Nemours. August 15, 1984. 15 pp, 10 tables, 19 figures. No references.

B. Materials and Methods (Protocols)

Analytical grade DPX Y6202 (hereinafter 'DPX') was radiolabeled in the ^{14}C quinoxaline group, and was found to be >99% radiopure with a specific activity of 29 uCi/mg. Both 5 ppm and 50 ppm stock solutions (in acetone) were prepared (the 50 ppm solution containing 80% unlabeled DPX).

The following description applies to both Flanagan silty loam and Woodstown Sandy loam. Soil characteristics are summarized in report table 1, appended.

Twenty biometer flasks were prepared to contain 50 gm (dry weight) soil; four were subsequently sterilized. A total of 8 nonsterile flasks were amended with 1 ml of the 5 ppm DPX standard. The remaining sterile and non-sterile flasks were amended with 1 ml of the 50 ppm DPX standard. Then each flask was adjusted to 70% moisture holding capacity (no mention of 1/3 bar).

Two additional flasks from each group were amended with a solution of ^{14}C cellulose to verify microbial viability.

One additional flask from each group was treated with 5000 ppm non-labeled standard DPX (+ 1 ml of 50 ppm-labeled DPX) to generate sufficient quantities of degradates for identification.

All flasks (containing a side arm charged with 0.1M NaOH to trap volatiles) were incubated at 25°C, in the dark for the remainder of the experimental period.

Aliquots of non-sterile soil were taken on day 0, thence after 1.5, 3, 5, 8.5, 16.5, 36 and 50 weeks of incubation. Aliquots of sterile soil were taken on day 0, thence after 5, 16.5, 36 and 50 weeks of incubation.

Alkali traps were replaced at 2 week intervals with fresh solution.

Soils were extracted four times with acetone/methylene chloride (50:50, v:v), pooled, concentrated and counted by LSC. Additional extractions were made with both acidic and basic solvents (H_3PO_4 in acetonitrile, and NH_4CO_3 in Methylene Chloride/Methanol. Fully extracted soils were air dried, then subjected to combustion and LSC quantification.

Component analysis involved streaking concentrated extracts on either 0.25 or 0.50 mm thick silica gel plates. Spots were developed with toluene/acetone/methanol/acetic acid (150:60:12:1, v/v/v/v). Radio-spots were located by radioautography or UV visualization (Berthold Linear Analyzer). Spots were scraped from the plates and quantified by LSC.

Total radioactivity in the alkali solutions was determined by $BaCl_2$ precipitation; any remaining radioactivity in the clear supernatant being indicative of non-CO_2 conponents.

Mass spectral analysis of soil extracts (probe/EI as well as probe desorption/CI$^{\bullet}CH_4$) permitted the confirmation of the major components.

C. Reported Results

Results for all samples are summarized in report tables 4 - 9, appended to this review.

Viability of the soils was reported, based on significant CO_2 evolution in the cellulose-treated flasks.

After 50 weeks, only 5-7% of total radioactivity had been converted to CO_2 in either soil. The proposed metabolic pathway is summarized in report figure 19, appended.

Four theoretical decomposition products seemed to have R_f values which were identical to standards used in the TLC phase of the experiment. See report table 2 for structures.

Of the 30% contribution made by the polar components at 36 week, analysis revealed that as many as three distinct components may have been present. Unknown 2 was confirmed to be hydroxylated 6-chloroquinoxalin-2-ol.

Halflives were apparently estimated by graphical interpolation (figures 11-16, not appended), as follows:

Condition		Half-life	Component
Non-sterile	soils (both)	1 week	Parent
"	Flanagan	10 weeks	DPX acid
"	Woodstown	18 weeks	DPX acid
Sterilized	Flanagan	9 weeks	Parent
"	Woodstown	6 weeks	Parent

D. Study Author's Conclusions/Quality Assurance Measures

None.

E. Reviewer's Discussion and Interpretation of Study Results

The reported data for parent DPX were subjected to statistical evaluation assuming first order kinetics. The following table summarizes those computations:

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Condition	Soil Type	PPM	Half-life (weeks)	Correlation (r^2)
Non-Sterile	Flanagan	0.1	18.5	0.53
Non-Sterile	Flanagan	1.0	23.1	0.33
Non-Sterile	Woodstown	0.1	20.6	0.29
Non-Sterile	Woodstown	1.0	22.1	0.44
Sterile	Flanagan	1.0	18.2	0.98
Sterile	Woodstown	1.0	18.9	0.62

In all instances but one, the computed correlation between time and concentration of DPX were well below acceptable levels. In addition, the author has not demonstrated that the presence of microbes enhances the rate of degradation of DPX.

This study is unacceptable in support of the aerobic soil metabolism data requirement. The registrant will have to enhance the reported data or otherwise justify the low correlation of the data before this study can be found acceptable. See §8 (Recommendations), above.

11. COMPLETION OF ONE-LINER:

No new data have been added to the ongoing one-liner summary.

12. CBI APPENDIX:

Data contained in the appendix to this review is considered as CBI by the registrant, and should be treated as such.

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Assure exposure assessment review

Page _____ is not included in this copy.

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