

US EPA ARCHIVE DOCUMENT

FILE COPY

Shaughnessy No NEW CHEMICAL

Date Out of EAB 19 JUL 1983

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

From Richard V Moraski Head (acting)
Review Section #1
Exposure Assessment Branch
Hazard Evaluation Division (TS-769)



Attached please find the EAB review of...

Reg./File No 352 EUP-RRE

Chemical Ethyl-2-[(4-(6-chloro-2-quinoxalyloxy)phenoxy]propionate (IUPAC)

Ethyl 2-[4-[(6-chloro-2-quinoxalinyl)oxy]phenoxy] propionate CAS

Type of Product Herbicide

Product Name DPX-Y6202

Company Name E. I. DuPont De Nemours and Company

Submission Purpose Data to support new EUP use on fallow land

ZBB Code other

Action Code(s): 700

Date In 5/9/83

EAB #(s): 3365

Date Completed 7/19/83

TAIS (level II) Days

63

4.0

Deferrals to:

- Ecological Effects Branch
- Residue Chemistry Branch
- Toxicology Branch

1 0 INTRODUCTION

E I DuPont De Nemours and Company has submitted details of the experimental program (Accession #250071) as well as EF data to support the EUP testing of its new herbicide DPX-Y6202 (Reg #352-EUP-RRE) for use on fallow land

2 0 STRUCTURE

See technical data sheets appended to this review.

3 0 DIRECTIONS FOR USE

See proposed EUP label appended to this review.

4 0 EXPERIMENTAL PROGRA

DuPont proposes to apply 631 pounds ai to 10000 acres (5000/year) in a total of 14 states (see appended summary). Average application rate translates to 0.5 ounces of DPX-T6202/acre (0.3 - 1.0 ounces or 10 - 28 gms). The experimental period is to run from 8/1/83 to 8/1/85

5.0 REVIEW OF SUBMITTED DATA

- 5.1 Anon 1983 Aerobic Soil etabolism of [¹⁴C]-phenyl-Labeled DPX-Y6202. in Document No. APR-126-83. Company confidential. E.I. DuPont de Nemours and Company, Inc. Biochemicals Department, Research Division, Experimental Station, Wilmington, Delaware 19898. (4 pages, 3 figures, 4 tables, no references)

Experimental

The soil used in the study (a silty loam with the following characteristics 7% clay, 5.1% total O.C., 25.6 meq/100g CEC, pH 6.0) was crushed, sieved, humidified, oven dried and incubated at 30 C in the dark under either aerobic or anaerobic conditions.

Anaerobicity was created by nitrogen purge followed by stoppering. Sterilization of control soil was by autoclaving at 120 C for 30 minutes.

Aliquots of soil (25 gms) were mixed with [¹⁴C]-phenyl-Labeled DPX-Y6202 (in acetone, to an apparent concentration of 2 ppm in the soil).

During the experiment, volatiles were trapped in either KOH or ethylene glycol monethyl ether solutions. Samples of soil and solutions were taken on days 0, 1, 3, 7, 15 and 30).

Results

Tables 1, 3 and 4 appended to this review summarize the reported data for degradates and/or metabolites detected during the study. The registrant estimates soil half-life under both aerobic and anaerobic conditions to be less than one day, with the amount of parent DPX-Y6202 remaining after 15 days to be 15.5% and 12.1% of applied.

Discussion

Compound #2 is the deesterified (acid form) derivative of parent DPX-Y6202, and, as such, is not significantly different from the parent compound. Thus the half-life was recomputed based on the overall rate of degradation of the combined parent/desethyl-parent (compounds #1 + #2).

Data From Report Tables 3 and 4. (Compounds #1 + #2)

Condition	% Remaining						Half-Life
	Day 0	Day 1	Day 3	Day 7	Day 15	Day 30	
Aerobic	82.00	60.27	49.67	46.36	51.14	34.72	34 days
Anaerobic	83.75	62.30	56.88	50.72	44.01	42.94	40 days

Conclusions

There are a number of deficiencies in these two experiments which may invalidate them. Principally, it appears that only one sample was taken for analysis at each sampling interval. Statistical analysis of the reported data suggest a relatively poorly fitting regression line with squared correlation coefficients of about 0.6. Additional deficiencies include the following: purity of test substance not specified; insufficient detail as to how concentrations of analyte in soil were calculated; no details of analytical methodologies used (radioautography or LSC?); uncertainty of anaerobicity in that portion of the experiment; incubation for 30 days not done.

5 2

Cadwgan G E 1983 Hydrolysis of [¹⁴C]-Quinoxalin-Labeled DPX-Y6202 in Document No. A¹⁴R-127-83. Company confidential E I DuPont de Nemours and Company Inc Biochemicals Department. Research Division, Experimental Station, Wilmington. Delaware 19898 (5 pages. 4 figures. 1 table. no references)

Experimental

Analytical grade [¹⁴C]-quinoxaline-labeled DPX-Y6202 was synthesized and found to have a specific activity of 29 uCi/mg with a radiopurity of 99% (methods unknown). Suitable buffers were prepared to pH values of 5, 7 and 9, then sterilized by autoclaving. Analyte was added to each set of buffers to yield solution concentrations of 0.1 and 0.01 ppm. Bottles were sealed and kept in the dark in an incubator set to 25 C. Aliquots were taken on days 0, 3, 7, 10, 14, 17, 21, 24, 28 and 31.

Analysis was by solvent extraction (methylene chloride) followed by TLC against non-radioactive standards of the postulated hydrolytic products (see table 1, appended to this review). Radioactive spots were visualized by one of two methods - scanning with a Berthold TLC radioscanner, or via autoradiography using Kodak SB-5 X-ray film. Identified radiospots were scraped, taken up in scintillation cocktail, and suitably counted by LSC.

Results

Reported halflives were approximately 1 day at pH 9, 15 days at pH 7 and 27 days at pH 5 (presumably hydrolysis of ester linkage only).

Conclusion

The experimental conditions used in this study were adequate, and should have yielded reliable data. Unfortunately, no raw data were submitted with the study. Since we could not confirm company statistics, this study is not acceptable.

6.0 DISCUSSION

Both the experimental program and the proposed EUP label are acceptable.

In addition to the two submitted studies, Subpart N normally requires two additional studies - accumulation in rotated crops and accumulation in fish.

Since the use is non-crop (fallow land), the accumulation in rotated crops data requirement may be waived at this time.

However, we see not justification to waive the accumulation in fish data requirement since the reported K_{ow} is 19000, and the product does not readily hydrolyse.

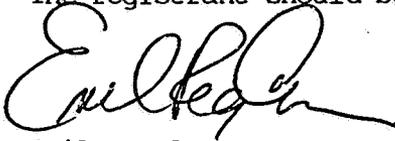
4

7 0 CONCLUSIONS

EAB cannot concur with the issuance of the EUP at this time. The submitted hydrolysis and soil metabolism studies contain numerous deficiencies which render them unacceptable. The accumulation in rotated crops data requirement will not be required for this fallow land use. However, the study of accumulation in fish must be submitted for review and found acceptable prior to EAB concurrence with the proposed EUP.

8.0 RECOMMENDATIONS

The registrant should be informed of the above findings.



Emil Regelman
Chemist
EAB/HED (TS-769c)
July 19, 1983

DU PONT DPX-Y6202 GRASS KILLER

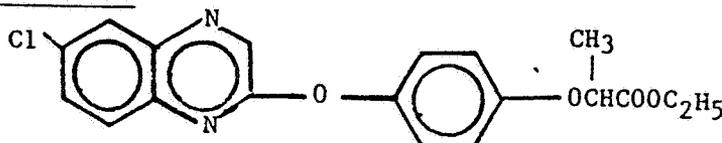
TECHNICAL DATA SHEET

Chemical Name

IUPAC: Ethyl-2-[(4-(6-chloro-2-quinoxalyloxy)phenoxy] propionate

C.A. : 2-[4-[(6-chloro-2-quinoxalinyloxy]phenoxy] propionic acid, ethyl ester

Structural Formula



Chemical and Physical Properties (Technical)

- Molecular Formula: C₁₉H₁₇ClN₂O₄
- Molecular Weight: 372.8
- Physical State: Crystalline solid
- Color: White
- Odor: None
- Melting Point: 92°C
- Vapor Pressure at 20°C: 3 X 10⁻⁷ mm Hg
- Solubility in various organic solvents at 25°C:

	<u>g/ml</u>
Acetone	0.11
Acetonitrile	0.086
Ethanol	0.009
Benzene	0.29
Xylene	0.12
N-Hexane	0.0026
1,4-Dioxane	0.35

- Water solubility at controlled pH^a at 25°C:

<u>pH</u>	<u>Solubility of DPX-Y6202 (mg/L)</u>
5.4	0.34
7.1	0.31
9.0	0.29
10.4	0.31

^a0.05M Buffer Solutions

- Specific Gravity: d₄²⁰ : 1.35
- Octanol/Water Partition Coefficient: 1.9 X 10⁴

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- Flammability: Non-flammable
- Dissociation Constant: Does not dissociate.
- pH: 6.8

CHEMICAL AND PHYSICAL PROPERTIES
(10.4% EMULSIFIABLE CONCENTRATE FORMULATION)

- Physical State: Liquid
- Color: Amber
- Odor: Petroleum
- Density at 20°C: 0.924 g/cc
- pH (1% in distilled water): 5.9
- Oxidizing/Reducing Action: None
- Flammability:
 - Setaflash Closed Cup Flash Point: 39°C
 - Autoignition Temperature: 1004°F (540°C)
- Explodability:
 - Lower Explosive Limit: 3.4%
 - Upper Explosive Limit: 38.8%
- Viscosity: 1 to 5 centipoises at 20°C
- Corrosion Characteristics: No corrosion noted on mild steel, aluminum, or polyethylene in storage tests at 45°C for 7 weeks.

April, 1983

8

Experimental Use Permit Application
DPX-Y6202

Fallow

E. I. du Pont de Nemours and Company (Inc.)
Biochemicals Department
Wilmington, Delaware 19898
April, 1983

B

LABELING

AMOUNT, FREQUENCY, AND TIME OF APPLICATION

Details are furnished in the enclosed proposed Experimental Use
Permit dated April, 1983.

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Assure exposure assessment review

Page _____ is not included in this copy.

Pages 10 through 21 are not included in this copy.

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