3-4-92

Shaughnessy No.: 031401

Date Out of EFGWB: 4 MAR 1992

To: Judith Coombs
Product Manager # 74
Special Review and Reregistration Division

From: Paul Mastradone, Ph.D., Chief
Environmental Chemistry Review Section #1
Environmental Fate & Ground Water Branch/EFED (H7507C)

Thru: Henry Jacoby, Chief
Environmental Fate & Ground Water Branch/EFED (H7507C)

Attached, please find the EFGWB review of...

Reg./File #: 030501/D160882

Chemical Name: 2,4-DP

Type Product: Herbicide

Product Name:

Company Name: 2,4-DP Task Force and Rhone-Poulenc

Purpose: Review of environmental fate strategies

Action Code: 660 EFGWB #(s): 91-0839

Date Received: 11/90 Total Reviewing Time: 2 days

Deferrals to: ___ Ecological Effects Branch

___ Dietary Exposure Branch

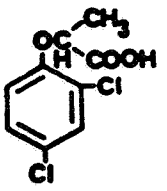
___ Non-Dietary Exposure Branch

___ Toxicology Branch I

___ Toxicology Branch II

1.0 CHEMICAL:

chemical name: (2-(2,4-dichlorophenoxy) propionic acid
trade name: N/A
structure:
CAS #:N/A
Shaughnessy #: 031401



2.0 TEST MATERIAL: N/A

3.0 STUDY/ACTION TYPE: Review of proposed environmental fate strategy for (2-(2,4-dichlorophenoxy) propionic acid (2,4-DP).

4.0 STUDY IDENTIFICATION:N/A

5.0 REVIEWED BY:

James A. Hetrick, Ph.D. Signature: James A. Hetrick
Chemist, ECRS # 1 Date: 29 JAN 1992
EFGWB/EFED/OPP

6.0 APPROVED BY:

Name: Paul Mastradone, Ph.D. Signature: Paul J Mastradone
Section Chief, ECRS # 1 Date: 29 JAN 1992
EFGWB/EFED/OPP

7.0 CONCLUSIONS:

General: The proposed fate strategies for 2,4-DP are modeled after the 2,4-D environmental fate strategy. This strategy assumes the salts rapidly dissociate or the esters rapidly hydrolyze to the free acid. Therefore, salts and esters of 2,4-DP should not persist under normal environmental conditions.

EFGWB concludes the proposed fate strategy for 2,4-DP appear to provide the necessary fate data for [X]-2,4-DP [X= dimethylamine (DMAS), 2-ethylhexyl ester (2-EHE), butylethyl ester (BEE)] compounds. EFGWB believes, however, the environmental fate strategies should be conducted in a tiered approach; where the environmental bridging data-dissociation rates of salts and hydrolysis rates of the esters-are submitted and reviewed before conducting the environmental fate studies. Therefore, the data requirements for [X]-2,4-DP compounds should be reserved pending the results of acceptable salt dissociation and ester hydrolysis studies.

EFGWB believes the the 2,4-DP esters may be volatile; therefore, laboratory soil volatility studies for 2,4-DP 2-EHE should be reserved pending the results of product chemistry studies. EFGWB also believes the spray drift data for 2,4-D 2-EHE may not adequately represent 2,4-DP 2-EHE or 2,4-DP BEE. Because the spray drift of a pesticide is dependent on the spray equipment and chemical formulation, EFGWB believes the spray droplet size

spectrum of 2,4-DP BEE and 2,4-DP 2-EHE should be compared with 2,4-D 2-EHE. If the spray droplet size spectrums are simila r, then drift field evaluations for 2,4-D 2-EHE should provide adequate surrogate spray drift data for 2,4-DP BEE and 2,4-DP 2-EHE. At this time, the spray droplet studies are required for the 2,4-DP-[X] compounds. The drift field studies are reserved for 2,4-DP-[X] compounds pending the results of acceptable spray droplet studies for the 2,4-DP-[X] compounds and 2,4-D 2-EHE. Additionally, the waiver requests for accumulation in fish studies cannot be granted without a full review of environmental fate and product chemistry data for the 2,4-DP-[X] compounds.

The status of the data requirements for 2,4-DP-[X] compounds is shown in Tables 1.

8.0 RECOMMENDATIONS: See Section 7.0

9.0 BACKGROUND: N/A

10.0 DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

The proposed environmental fate strategies for 2,4-DP and 2,4-DP BEE are modeled after the 2,4-D environmental fate strategy (submitted to EPA on October 16, 1989).

2,4-DP: The 2,4-DP Task Force is supporting terrestrial non-food uses for the 2,4-DP dimethylamine salt (2,4-DP DMAS) and the 2-ethylhexyl ester (2,4-DP 2-EHE). Additionally, the task force is supporting aquatic non-food and domestic outdoor uses for 2,4-DP DMAS, and forestry and terrestrial non-food uses for 2,4-DP 2-EHE. The task force also is supporting registration of the 2,4-DP technical acid.

The fate strategy is based on linking the dissociation of 2,4-DP DMAS and the hydrolysis of the 2,4-DP 2-EHE to its free acid, 2,4-DP. Laboratory studies including hydrolysis, photo-degradation in water, photodegradation on soil, aerobic soil metabolism, anaerobic aquatic metabolism, aerobic aquatic metabolism, and leaching /adsorption-desorption will be conducted with 2,4-DP. It should be noted the anaerobic aquatic metabolism study is being submitted in lieu of an anaerobic soil metabolism study. The registrant will also submit aerobic and anaerobic soil metabolism studies for DMA and 2-EHE moieties.

Based on the use patterns of 2,4-DP, soil and forestry dissipation studies will be conducted with 2,4-DP 2-EHE and 2,4-DP DMAS; and aquatic dissipation studies will be conducted with 2,4-DP DMAS. The registrant also requests to reserve fish bioaccumulation studies pending results of environmental fate and product chemistry studies. If the formulated compounds have a $K_{ow} \leq 1000$ or a half-life < 4 days, then the registrant requests to waive the accumulation in fish (164-5) data requirement. In addition, the registrant will submit surrogate spray drift data for 2,4-D 2-EHE to represent 2,4-DP EHE.

2,4-DP BEE: Rhone-Poulenc AG Company is supporting terrestrial non-food, aquatic non-food, and forestry use patterns for 2,4-BEE.

The fate strategy is based on linking the hydrolysis of the 2,4-DP BEE to its free acid, 2,4-DP. Laboratory studies including hydrolysis, photodegradation in water, photodegradation on soil, aerobic soil metabolism, anaerobic aquatic metabolism, aerobic aquatic metabolism, and leaching/adsorption-desorption will be conducted with 2,4-DP. It should be noted the anaerobic aquatic metabolism study is being submitted in lieu of an anaerobic soil metabolism study. The registrant will also submit aerobic and anaerobic soil metabolism studies for the BEE moiety. Additionally, soil, aquatic, and forestry dissipation studies will be conducted with 2,4-DP BEE.

The registrant also requests to reserve fish bioaccumulation studies pending the results of acceptable environmental fate and product chemistry studies. If the formulated compounds have a $K_{ow} \leq 1000$ or a half-life < 4 days, then the registrant requests to waive the accumulation in fish (164-5) data requirement. In addition, the registrant will submit surrogate spray drift data for 2,4-D 2-EHE to represent 2,4-DP BEE.

11.0 COMPLETION OF ONE-LINER: N/A
12.0 CBI APPENDIX: N/A

Table 1:Data Requirements for Environmental Fate Strategy of 2,4-DP-X compounds (x-esters,amine salts, and acid)

Data Require-ment #	Study Descriptor	Use Group10	2,4-DP Salt	2,4-DP Ester	2,4-DP
	Dissociation Rate Studies	All use groups	Required	NA	NA
161-1	Hydrolysis	All use groups	Reserved1	Required	Required
161-2	Photodegradation in Water	A,B,C,D,E,F,G,I	Reserved1	Reserved5	Required
161-3	Photodegradation on Soil	A,B,I	Reserved1	Reserved5	Required
161-4	Photodegradation in Air	A,B,G,H,I,J	Reserved2	Reserved2	Reserved2
162-1	Aerobic Soil Metabolism	A,B,C,D,G,H,I,J	Reserved1,8	Reserved5,8	Required
162-2	Anaerobic Soil Metabolism	A,B	Reserved1,8	Reserved5,8	Required
162-3	Anaerobic Aquatic Metabolism	A,B,C,D,E,F,I	Reserved1,8	Reserved5,8	Required
162-4	Aerobic Aquatic Metabolism	C,D,E,F,I	Reserved1,8	Reserved5,8	Required
163-1	Leaching/Adsorption-Desorption	All use groups	Reserved1	Reserved5	Required
163-2	Laboratory Volatility	A,B,G,H	Reserved2	Reserved2	Reserved2
163-3	Field Volatility	A,B,G,H	Reserved4	Reserved4	Reserved4
164-1	Terrestrial Field Dissipation	A,B,C,D,E,I	Required	Required	Reserved7
164-2	Aquatic Field Dissipation	C,D,E,F	Required	Required	Reserved7
164-3	Forest Field Dissipation	I	Required	Required	Reserved7
164-5	Long-term, Soil Dissipation	A,B,C,D,E,I	Reserved3	Reserved3	Reserved3,7
165-1	Confined Rotational Crop	A,B,C	Reserved9	Reserved9	Required9
165-2	Field Rotational Crop	A,B,C	Reserved6	Reserved6	Reserved6
165-3	Accumulation in Irrigated Crops	C,D,E	Reserved9	Reserved9	Required9
165-4	Accumulation in Fish	A,B,C,D,E,F,I	Reserved9	Reserved9	Required9
165-5	Accumulation in Non-Target Org.	A,B,C,D,E,F,I	Reserved9	Reserved9	Required9
201-1	Droplet Size Spectrum	A,B,C,D	Required	Required	Required7
201-2	Drift Field Evaluation	A,B,C,D	Required	Required	Required7

1-The data requirement is reserved pending the results of an acceptable salt dissociation rate study.
2-The data requirement is reserved pending the results of acceptable product chemistry vapor pressure data.
3-Long-term terrestrial field dissipation studies are reserved pending results of terrestrial field dissipation studies.
4-Field volatility studies are reserved pending the results of laboratory volatility studies.
5-The data requirement is reserved pending the results of an acceptable ester hydrolysis study.
6-Field rotational crop studies are reserved pending the results of acceptable confined rotational crop studies.
7-The data requirement is reserved pending registrant support of typical end use product.

8-Data Requirements for the amine or alcohol moiety from 2,4-DP-X [X=amine or ester] degradation.

Data Requirement	Study Descriptor	Amine Moiety	Alcohol Moiety
161-1	Hydrolysis	Reserved[a]	Reserved[a]
161-2	Photodegradation in Water	Reserved[a]	Reserved[a]
161-3	Photodegradation in Soil	Reserved[a]	Reserved[a]
162-1	Aerobic Soil Metabolism	Required[b]	Required[b]
162-2	Anaerobic Soil Metabolism	Required[b]	Required[b]
162-3	Aerobic Aquatic Metabolism	Required[c]	Required[c]
162-4	Anaerobic Aquatic Metabolism	Required[c]	Required[c]
163-1	Leaching/Adsorption-Desorption	Reserved[a]	Reserved[a]
163-2	Laboratory Volatility	Reserved[a]	Reserved[a]

a-The data requirement is reserved pending the results of acceptable metabolism studies.
b-The data requirement is required when the 2,4-DP-X [X= ester or amine salt] compound is used in terrestrial environments.
c-The data requirement is required when the 2,4-DP-X [X= ester or amine salt] compound is used in aquatic environments.

9- If environmental fate bridging data indicates rapid degradation (ie salt dissociation or ester hydrolysis, respectively) of the 2,4-DP-X compound, then studies for the 2,4-DP acid may be used as "surrogate data" to fulfill the data requirement for the 2,4-DP-X [X=amine salt or ester] compound. Conversely, studies for the 2,4-DP-X [X=ester or amine salt] compounds may be used as "surrogate data" to fulfill data requirements for 2,4-DP acid.

10- Use Group Categories
A-Terrestrial food/feed crop
B-Terrestrial nonfood crop
C-Aquatic food crop
D-Aquatic nonfood outdoor
E-Aquatic nonfood industrial
F-Aquatic nonfood residental
G-Greenhouse food crop
H-Greenhouse nonfood crop
I-Forestry
J-Residential Outdoor
K-Indoor -no environmental fate data requirements are required for indoor use groups.
*-Bold letters denotes data requirement is conditionally required for specific use groups.