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Date Out EFB: NOV 9 1981

To: Franklin D. R. Gee
Product Manager 17
Registration Division (TS-767)

From: Dr. Willa Garner, Chief
Review Section No. 1
Environmental Fate Branch
Hazard Evaluation Division (TS-769)

Attached please find the environmental fate review of:

Reg./File No.: 201-401

Chemical: fenvalerate [cyano-(3-phenoxyphenyl)methyl-4-chloro-alpha-(1-methylethyl) benzeneacetate]

Type Product: Insecticide

Product Name: Pydrin

Company Name: Shell Oil Co.

Submission Purpose: Field dissipation studies/residue data for soil metabolites.

ZBB Code: other

ACTION CODE: 436

Date In: 9/4/81

EFB # 436

Date Completed: 11/9/81

TAIS (level II)	Days
60	1

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

1.0 INTRODUCTION

1.1.1 On December 16, 1980, the PM (Gee) notified the registrant (Shell) of several data deficiencies noted by EFB in its review of the field soil dissipation studies which had been submitted. Deficiencies centered about the fact that residue figures reported included only the parent compound. Specifically...

a. Why was only the parent compound analyzed?
b. Are the residues given only for parent compound?
c. Are there any degradates present in the soil cores that are being missed?
d. Why weren't TLC and HPLC used to identify and quantify degradates?

1.1.2 In its response on September 1, 1981, the registrant provided "Field Dissipation Studies, Residue Data for Soil Metabolites" August, 1981. Shell Oil Company (Accession #245832), which they felt should be sufficient to answer the issues raised.

1.2 This submission contains results from four different areas of the country.

1.2.1 RIR-24-135-79-D 1979 - Residue Data for Some Possible Degradation Products of SD 43775 in Soil Receiving 10 and 15 Applications of SD 43775, An Alabama Study.

1.2.2 RIR-24-140-79-C 1979 - Residue Data for Some Possible Degradation Products of SD 43775 in Soil Receiving 10 and 15 Applications of SD 43775, An Arizona Study.

1.2.3 RIR-24-391-78-C 1978 - Residue Data for Some Possible Degradation Products of SD 43775 in Soil Receiving 10 and 15 Applications of SD 43775, An Louisiana Study.

1.2.4 RIR-24-381-78-D 1978 - Residue Data for Some Possible Degradation Products of SD 43775 in Undisturbed Soil Receiving 15 Applications of SD 43775, An Oklahoma Study.

2.0 STRUCTURE AND DIRECTIONS FOR USE

See previous reviews.

3.0 DISCUSSION

3.1 The original studies have already been evaluated (see review of 11/19/80). This petition summarizes the Protocol, Application, Sampling, Laboratory Handling and Analytical Information associated with each of the studies.

In these studies, samples, taken in the earlier studies were re-analyzed for the following degradates:

a. SD 48838 4-chloro-alpha-(1-methylethyl)-cyano-(3-phenoxy-4-hydroxyphenyl)methyl benzeneacetate
b. SD 47117 4-chloro-alpha-(1-methylethyl),(aminocarbonyl)-(s-phenoxyphenyl)methyl benzeneacetate
c. SD 44064 4-chloro-alpha-(1-methylethyl) benzeneacetic acid

3.2 Methods and Materials

Samples analyzed had been taken at approximately 45 and 180 days following the last of either 10 or 15 consecutive treatments, and had been kept frozen (-10°C) until analyzed. Samples were screened to pass eight mesh, multiple-extracted with acetone/hexane in a high frequency vibration device (Braunsonic 1510), and centrifuged for 15 minutes.

SD 47117 and SD 48838 were isolated by solvent exchange to hexane, water wash, hexane partitioning with acetonitrile, and exchange again with 3:2 acetonitrile:water for HPLC analysis.

SD 44064 was isolated by solvent exchange to hexane, water wash, hexane partitioning with acetonitrile, exchange to hexane again, then transfer to a Florisil column. SD 44064 was then eluted with methanol and exchanged with 1:1 acetonitrile:water for HPLC analysis.

Quantification was on a Spectra Physics HPLC using a 15mm x 4.6mm Zorbax ODS column, equipped with a Schoeffel 770 UV detector. The mobile phase was acetonitrile/water (3:2) at 2 ml/min for the SD 47117 and SD 48838, and 1:1 (with 0.2% acetic acid) for SD 44054.

Minimum detectable concentrations (MDC) were determined by calibration curve as the amount of each compound which would give a response of at least 3% of full scale at a noise level below 1% of full scale. MDCs were 0.03, 0.03 and 0.02 ppm for SD 47117, SD 48838, and SD 44064, respectively.

Recoveries were estimated by fortification of soils prior to extraction, and ranged from 86 to 124% for all studies combined.

3.3 Results

No SD 48838 was detected in any sample. SD 44064 was detected in only one sample (Oklahoma study), at .02 ppm. Some of the samples from Arizona, Alabama and Oklahoma contained trace residues at or just below the limit of detection, while only two samples from Louisiana showed marginally detectable residues.

4.0 CONCLUSIONS

The three major degradates of Pydrin do not persist in four different soil types, despite 10 to 15 consecutive multiple applications.

5.0 RECOMMENDATION

The questions raised in the 12/16/80 letter have been answered satisfactorily. This issue is resolved.

Emil Regelman
Chemist
EFB/HED