Shaughnessy No: 081901

Date out EAB: 17 MAY 1984

To: H. Jacoby
Product Manager #21
Registration Division (TS-767)

From: Samuel M. Creeger, Chief
Environmental Chemistry Review Section 1
Exposure Assessment Branch
Hazard Evaluation Division (TS-769c)

Attached, please find the EAB review of:

Reg./File No.: 50534-8

Chemical: Chlorothalonil

Type Product: F

Product Name: BRAVO 500

Company Name: SDS Biotech Corporation

Submission Purpose: resubmission, leaching data in support of use on citrus

ZBB Code: other

Action Code: 400

Date In: 1/31/84

EFB No.: 4179

Date Completed: 17 MAY 1984

TAIS (Level II)	Days
62	1

Deferrals To:

_____ Ecological Effects Branch

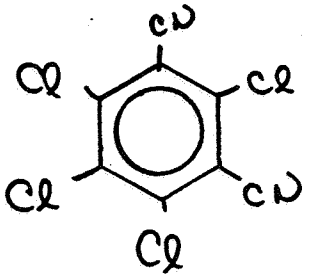
_____ Residue Chemistry Branch

_____ Toxicology Branch

1.0 INTRODUCTION

SDS Biotech Corporation has submitted a leaching study using chlorothalonil. Acc. No. 252253.

2.0 Bravo 500: chlorothalonil: DS-2787
2,4,5,6-tetrachloroisophthalonitrile



3.0 DISCUSSION

Mobility of Chlorothalonil and Metabolites in Soil Report No. 000-3EF-83-0112-002

Uniformly ring labeled chlorothalonil was tested for mobility in two soils, humic sandy soil and loam soil using soil column leaching technique. In addition, mobility of metabolites was determined using an aged soil column. The soil characteristics are given in Table 1.

Soil columns were 22 cm long (4.2 cm wide) and untreated soil was saturated with 0.005 M $CaSO_4$; 1.73 mg chlorothalonil per 50 g soil was added to top of each column. The columns were leached with 140 ml of 0.005 M $CaSO_4$ on each of three days using a total volume of 420ml $CaSO_4$ solution. The column was divided into five 5 cm sections and analyzed for radioactivity.

To determine mobility of metabolites, two samples of 50g of each soil type treated with radiolabeled chlorothalonil was aged at 20°C for 60 days in the dark. At the end of the aging one soil was analyzed for metabolite identification and the other was placed on column to study leaching characteristics. The columns were eluted with 420 ml of the $CaSO_4$ solution in the same way as before and the column was then divided into 5 parts of 5 cm each for analysis.

Results

Table 2 presents data which indicates that most (98%) of the chlorothalonil in the fresh study remains on top. However, some does leach through the column and is found in the leachate (<1%).

Table 4 shows radioactivity distribution in the aged column study. From 6 - 10% of applied radioactivity is found in leachate while 81-84% is found in top 5 cm segment.

Table 3 presents results of the analysis of the incubated soil with chlorothalonil and two metabolites accounting for more than 85% of applied radioactivity.

4.0 CONCLUSIONS and RECOMMENDATIONS

Leaching of chlorothalonil on fresh soils indicates a low mobility potential but, on aged column, their potential for leaching of parent and metabolites increases.

EAB considers this study to be inadequate and unacceptable for determining the leaching potential of chlorothalonil and its metabolites for the following reasons:

1. Soil column was 22 cm in length.
   Guidelines recommended length is 30-300 cm.

2. Soil columns were eluted with a total of 420 ml.
   Guidelines recommended volume for columns used in this study is 703 ml.

3. Study was conducted on two soils.
   Guidelines recommended using at least four soil types.

4. Neither soil used has a percent organic matter content of $\leq$1%.
   Guidelines recommended that at least one soil have an organic content of $\leq$1%.

EAB considers the leaching potential of chlorothalonil still unresolved and suggests the study be reported adopting Guidelines recommendations in carrying out the study.

Richard V. Moraski
Chemist

Table 1. Characteristics of the soils, determined by the Laboratory for Soil and Crop Testing (Oosterbeek).

		Humic sand	Loam
Organic matter (%)*		4.5	2.1
pH (KCl)		5.4	7.3
Granulation (%)*	clay (< 2 µm)	3.3	25.2
	silt (2-50 µm)	8.3	45.1
	sand (> 50 µm)	88.5	29.7
$CaCO_3$ (%)		0.1	7.9

*By weight.

Table 2. Distribution of ^{14}C after leaching of [^{14}C]chlorothalonil in soil columns (% of total in soil column).

Column part	Humic sandy soil	Loamy soil
0- 5 cm	98.6 (97.7)*	97.8 (97.9)
5-10 cm	0.7 (0.9)	1.5 (1.7)
10-15 cm	0.3 (0.6)	0.3 (0.2)
15-20 cm	0.1 (0.4)	0.2 (0.1)
20-25 cm	0.2 (0.4)	0.1 (0.1)
Leachate**	0.4 (0.6)	0.3 (0.2)

* ( ) = duplicate value.
** % of applied ^{14}C.

Table 3. Percentages of ^{14}C in chlorothalonil and metabolites in acetone-HCl extracts of soils incubated for 60 days with [^{14}C]-chlorothalonil.

	% of ^{14}C in	
	Humic sandy soil	Loamy soil
Chlorothalonil	48	42
4-Hydroxy-2,5,6-trichloroisophthalonitrile (I)	32	35
3-Cyano-2,4,5,6-tetrachlorobenzamide (II)	6	6

Table 4. Distribution of ^{14}C after leaching of aged [^{14}C]chlorothalonil in soil columns (% of total in soil column and leachate)

Column part	Humic sandy soil	Loamy soil
0- 5 cm	81.8 (81.5)	83.7 (81.9)
5-10 cm	6.2 (5.3)	5.9 (8.6)
10-15 cm	1.2 (1.2	2.4 (2.2)
15-20 cm	0.7 (0.9)	0.7 (0.9)
20-25 cm	0.9 (1.4)	0.7 (0.5)
Leachate**	9.1 (9.6)	6.6 (6.0)

* ( ) = duplicate value.

** % of applied ^{14}C: humic sandy soil 10.0(10.6); loamy soil 7.1(6.4).