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Date Out EFB: 22 APR 1982

To: Product Manager 25 Taylor
TS-767

From Dr. Willa Garner
Chief, Review Section No. 1
Environmental Fate Branch

Attached please find the environmental fate review of:

Reg./File No.: 524-316

Chemical: Alachlor

Type Product: Herbicide

Product Name: Lasso

Company Name: Monsanto

Submission Purpose: Catfish study 246596

ZBB Code: 3(c)(7)

ACTION CODE: 400

Date in: 1/6/82

EFB # 125

Date Completed: 22 APR 1982

TAIS (level II)	Days
67	3

Deferrals To:

_____ Ecological Effects Branch

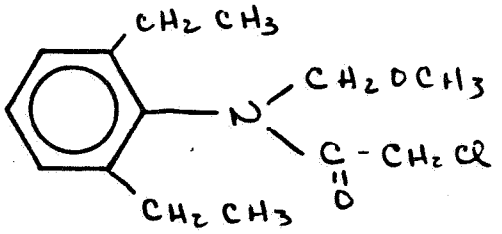
_____ Residue Chemistry Branch

_____ Toxicology Branch

1.0 INTRODUCTION

Monsanto has submitted a study on the bioaccumulation of alachlor and its metabolites in catfish under static conditions. Acc No 246506.

2.0 Lasso: Alachlor
2-chloro-2^{1},6$^{'}$-diethyl-N-(methoxymethyl)-acetanilide



3.0 DISCUSSION

Bioconcentration of Alachlor in Channel Catfish Under Static Conditions. Report No. MSL-1910, J. M. Malik, October 30, 1981.

The purpose of the study was to measure the bioconcentration of alachlor's soil metabolites. The soil used was Spinks sandy loam soil (2.4% of o.m.). The soil had been treated with 2.4 ppm of ^{14}C-alachlor and aged aerobically for 30 days.

Well water was then added and the soil/water mixture was allowed to equilibrate for 3 days before fish were added. Two hundred fifty-five fish were exposed for 30 days to the alachlor metabolites. The fish had a mean weight of 6g and a mean length of 78 mm.

Both control and treated soil samples were taken on days 0, 15, and 30 of aging and days 1 and 3 of equilibration and days 1, 3, 7, 10, 14, 22, and 30 of accumulation period. One liter of water was taken from each tank on all sampling days equilibration, the accumulation period, and depuration. Fish were sampled on 1, 3, 7, 10, 14, 22, and 30 days of exposure and 1, 3, 7, 10, and 14 days of depuration. Soil was analyzed by combustion and LSC techniques. Water samples were measured radiometrically. Fish samples were analyzed by combustion and LSC techniques.

The soil concentrations on day 0 of aging was 2.4 mg/kg; on day 30 of bioaccumulation, the concentration was 1.1 mg/kg in soil (Table 2 and Figure 2). The concentration in the water increased from 0.022 mg/l on day 0 to 0.10 mg/l on day 30 of bioaccumulation (Table 2 and Figure 3). The maximum mean tissue concentrations were: 0.49 mg/kg for fillet, 0.79 mg/kg for whole fish, and 1.4 mg/kg for viscera. The residue values represent bioaccumulation factors of 5.8X for fillet, 11X for whole fish, and 15X for viscera. After 14 days of depuration, more than 73% of accumulated residues were eliminated (Table 8 and Figure 3).

4.0 CONCLUSION AND RECOMMENDATION

- Bioconcentration of alachlor and its metabolites is not expected.
- This study, although not required by current guidelines, is acceptable and valid and will be used to assess overall environmental fate of alachlor.

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TABLE 2: Sampling schedule for radioanalyses of ^{14}C-Alachlor in soil, water and catfish[1].

	Aging Day				Equilibration			Exposure								Depuration				
Soil	0	1	15	30	1	2	3	0	1	3	7	10	14	22	30	1	3	7	10	14
Day Sampled	X	X	X	X	X		X	X	X	X	X	X	X	X	X					
Amount Sampled (g)	100	100	100	100	100		100	100	100	100	100	100	100	100	100					
Total residue by combustion-liquid scintillation	X	X	X	X	X		X	X	X	X	X	X	X	X	X					
Metabolite Characterization	X			X			X				1000			X	1000					
Fish																				
Day Sampled									X	X	X	X	X	X	X	X	X	X	X	X
Number of Fish Sampled																				
Without Metabolite Study									10	10	10	10	10	10	10	10	10	10	10	10
With Metabolite Study											30				30					30
Number of Fish Used for Fillet and Viscera Sample Analyses									10	10	10	10	10	10	10	10	10	10	10	10
Number of Fish Used for Whole Fish Analyses											5				5					5
Total Residue Analyses of Fillet and Viscera									X	X	X	X	X	X	X	X	X	X	X	X

TABLE 2 (page 2): Sampling schedule for radioanalyses of ^{14}C-Alachlor in soil, water and catfish[1].

	Aging Day				Equilibration			Exposure								Depuration				
Fish (cont'd)	0	1	15	30	1	2	3	0	1	3	7	10	14	22	30	1	3	7	10	14
Total Residue Analysis of Whole Fish																				
Metabolite Characterization											X				X					X
Water											X				X					X
Day Sampled					X			X	X	X	X	X	X	X	X	X	X	X	X	X
Amount Sampled (mls)					1000			1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Total Residue Analysis					X			X	X	X	X	X	X	X	X	X	X	X	X	X
Metabolite Characterization					X							X		X	X	X				

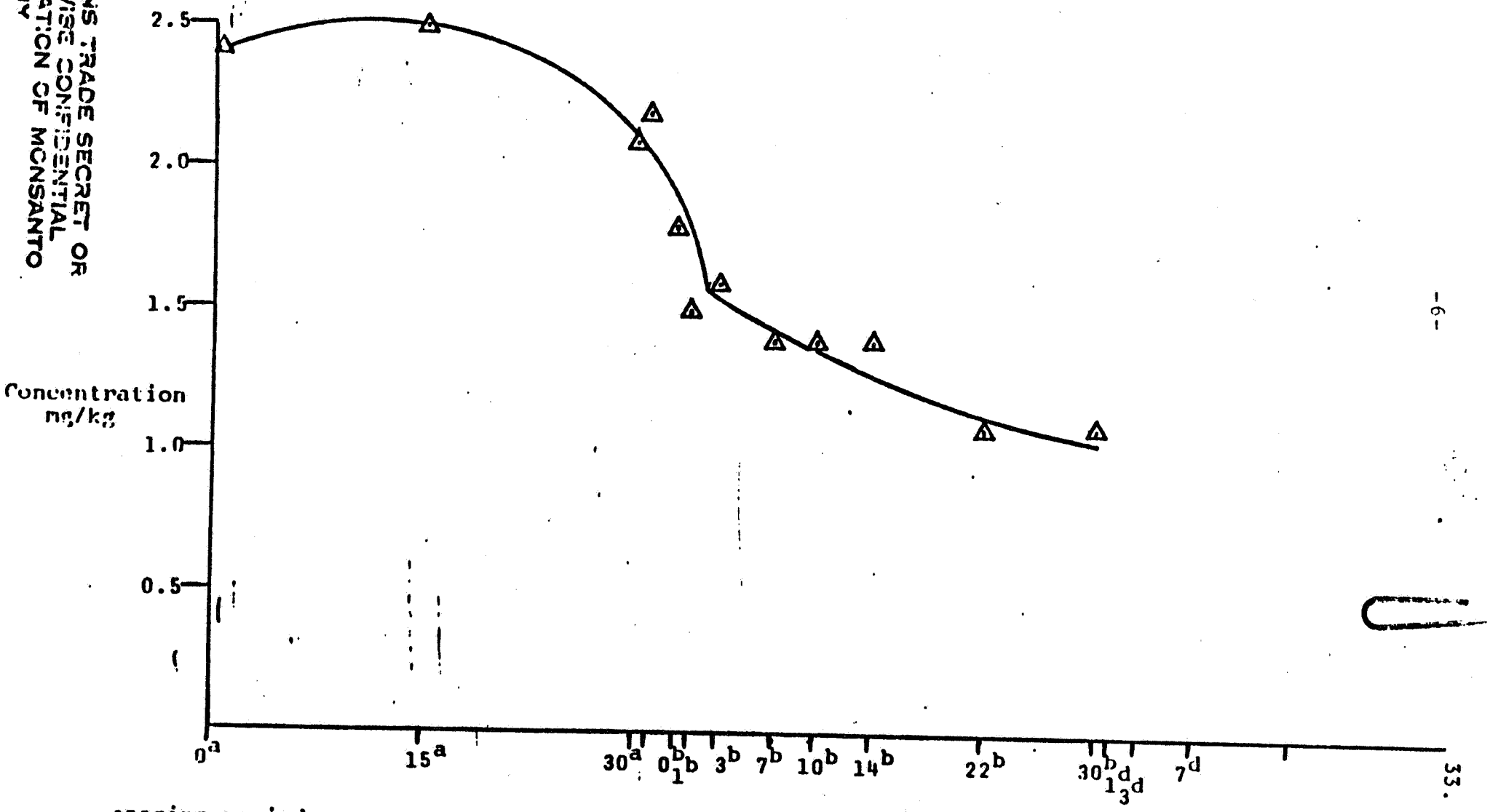
[1]This schedule is also applicable to the control samples.

TABLE 8: ^{14}C-Alachlor residues in channel catfish (Ictalurus punctatus) during periods of uptake (days 0-30) and depuration (days 1^d-14^d).

	^{14}C-residues as mg Alachlor/kg					
	Fillet		Whole Fish		Viscera	
Day	Results	Mean	Results	Mean	Results	Mean
1	0.16 0.17	0.16			0.40 0.33	0.36
3	0.34 0.35	0.34			0.67 0.72	0.69
7	0.42 0.41	0.41	0.83 0.75	0.79	1.0 1.0	1.0
10	0.51 0.48	0.49			1.2 1.3	1.2
14	0.39 0.39	0.39			1.4 1.4	1.4
22	0.34 0.37	0.35			0.94 0.99	0.96
30	0.29 0.30	0.29	0.41 0.42	0.41	0.68 0.66	0.67
1^d	0.11 0.12	0.11			0.34 0.34	0.34
3^d	0.11 0.11	0.11			0.21 0.21	0.21
7^d	0.083 0.092	0.087			0.089 0.095	0.092
10^d	0.082 0.081	0.081			0.091 0.089	0.090
14^d	0.080 0.077	0.078	0.072 0.076	0.074	0.080 0.079	0.079

^{d}depuration period.

FIGURE 2: ^{14}C-Alachlor residues in sandy loam soil during periods of aging, equilibration and bioaccumulation.



a=aging period
b=bioaccumulation period
d=depuration period

FIGURE 3: ^{14}C-Alachlor in channel catfish (Ictalurus punctatus) during periods of uptake (days 1-30) and depuration (days 1^{d}-14^{d}) compared to ^{14}C-Alachlor in water.