

Shaughnessy No.: 121601

Date Out of EFGWB: APR 27 1989

To: Robert Taylor/V. Walters
Product Managers team #25
Fungicide-Herbicide Branch
Registration Division (H7505C)

From: Emil Regelman, Supervisory Chemist
Chemistry Review Section #2
Environmental Fate and Ground Water Branch, EFED (H7507C)

Thru: Henry Jacoby, Acting Chief
Environmental Fate and Ground Water Branch
Environmental Fate and Effects Division (H7507C)

Attached, please find the EFGWB review of . . .

Reg./File # : 524-601
234-868
Common Name : Acetochlor
Type Product : Herbicide
Product Name : Top-Hand, Harness
Company Name : Monsanto Agricultural Company
Purpose : Evaluation of a terrestrial field dissipation study (164-1).
conducted in California in 1987.

Date Received: 10/31/88 Action Code: 101 & 711
Date Completed: 4/25/89 EFGWB #(s): 90095

Total Reviewing Time: (decimal days): 3.5 days

Deferrals to: Ecological Effects Branch, EFED
Science Integration and Policy Staff, EFED
Non-Dietary Exposure Branch, HED
Dietary Exposure Branch, HED
Toxicology Branch, F-H Support/HED

1. CHEMICAL: Common name:

Acetochlor.

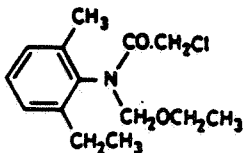
Chemical name:

2-Chloro-N-ethoxymethyl-6'-ethylacet-o-toluidide or
N-(ethoxymethyl)-2'-methyl-6'-ethyl-2-chloroacetanilide.

Trade name(s):

Top-Hand, Harness.

Structure:



Formulations:

7 lb ai/gal EC.

Physical/Chemical properties:

Molecular formula: $C_{14}H_{20}ClNO_2$.

Molecular weight: 269.8.

Physical state: Blue to purple oil.

Solubility: (25C) 233 mg/L water.

2. TEST MATERIAL:

7 lb ai/gal EC.

3. STUDY/ACTION TYPE:

Evaluation of a terrestrial field dissipation study.

4. STUDY IDENTIFICATION:

Lottman, C.M. 1988. Terrestrial field dissipation study: Determination of acetochlor residues following preemergent application of Top-Hand herbicide. Laboratory Project ID MSL-8118. Prepared and submitted by Monsanto Agricultural Company, St. Louis, MO. (40811902)

5. REVIEWED BY:

P. Datta, Ph. D.
Chemist

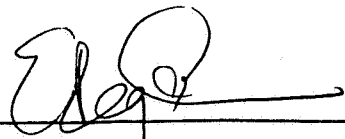
Envir Chem Review Section #2
EFGWB/EFED/OPP

Signature: PKDatta

Date: 4/14/89

6. APPROVED BY:

Emil Regelman
Supervisory Chemist
Chemistry Review Section #2
EFGWB/EFED/OPP

Signature: 

Date: APR 27 1989

7. CONCLUSIONS:

Monsanto submitted field dissipation studies (164-1), dating back 1980 ; (EPA acc #99814, 12/3/80, and EPA Acc # 71959, 9/15/83). These studies were conducted prior to the issuance of Subdivision N Guidelines 1982. In each case, the registrant response was inadequate, requiring information to validate these studies.

This current submission on field dissipation study in California, 1987 is not acceptable to EFGWB for continued registration of acetochlor because : (1) The time 0 concentrations of acetochlor in soil samples did not correlate with the theoretical amount based on the application rate, (2) The freezer storage stability data were too variable to demonstrate if acetochlor was stable in soil during frozen storage, and, (3) The climatic data were not from the actual site, but from a "nearby" NOAA station.

In addition, the reported data were poorly organized and scattered over the 165 page report and not in compliance with PR Notice 86-5.

8. RECOMMENDATIONS:

If the registrant satisfactorily addresses the deficiencies cited in the Conclusion Section, a study from an additional sites is still required for the proposed use pattern. If Monsanto cannot satisfactorily addresses those deficiencies then they must repeat the study on terrestrial soil field dissipation in two different sites which are representative of the area where acetochlor is used and the maximum label application rate must be used. This is in accordance with the guidance in Subdivision N of the Pesticide Assessment Guidelines, 1982.

A submission of a protocol is strongly encouraged prior to initiation of this study considering the continuing failure by this registrant to submit acceptable field dissipation study (164-1). RD should require Monsanto to submit a protocol and subsequent study within a shortest reasonable time frame. RD also should inform Monsanto about EFGWB's revised SEP for terrestrial field dissipation study (164-1).

The registrant should also be notified that the future submission must be more carefully organized and the format of these studies should comply with the PR Notice 86-5 requirements.

9. BACKGROUND:

On 8/30/88, Monsanto Company submitted this new study conducted in California in 1987 to fulfill the data gaps of the previously submitted field soil dissipation studies (164-1).

10. DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

Refer to the attached individual DER.

11. COMPLETION OF ONE-LINER:

See attached one-liner

12. CBI APPENDIX:

All data reviewed here are considered "company confidential" by the registrant and must be treated as such.

ENVIRONMENTAL FATE & GROUND WATER BRANCH
PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY

Page 1

Common Name: **ACETOCHLOR** Date: 04/19/89
Chem. Name : 2-CHLORO-N-(ETHOXYMETHYL)-N-(2-ETHYL-6-METHYL-PHENYL)-
: ACETAMIDE
Shaugh. # : 121601 CAS Number: 34256-28-1
Type Pest. : Herbicide
Formulation: EC
Uses : POSTEMERGENCE BROADLEAVED WEED CONTROL
:
:

Empir. Form: $C_{14}H_{20}NO_2Cl$
Mol. Weight: 269
Solub.(ppm): 223 @ 20 C

VP (Torr): <1
Log Kow : 2.6
Henry's :

Hydrolysis (161-1)

pH 5:[*] STABLE
pH 7:[*] STABLE
pH 9:[*] STABLE
pH :[]
pH :[]
pH :[]

Photolysis (161-2, -3, -4)

Air :[]
Soil :[#] INSIGNIFICANT
Water:[#]
:[]
:[]
:[]

MOBILITY STUDIES (163-1)

Soil Partition (Kd)

	%OM	Kd
1.[*] SOIL		
2.[] LINTONIA	0.7	.4
3.[] RAY	1.2	1.1
4.[] SPINKS	2.4	1.6
5.[] DRUMMER	3.4	2.7
6.[]		

Rf Factors

1.[]	DRUMMER SOIL RETAINED ABOUT
2.[]	57% OF APPL. ACETOCHLOR WHILE
3.[]	LINTONIA RETAINED ONLY 4%.
4.[]	
5.[]	
6.[]	

METABOLISM STUDIES (162-1,2,3,4)

Aerobic Soil (162-1)

	Days	Temp
1.[*] RAY SOIL:	8 DAYS	22 C
2.[*] DRUMMER SOIL:	10 DAYS	"
3.[*] SPINKS SOIL:	12 DAYS	"
4.[]		
5.[]		
6.[]		
7.[]		

Anaerobic Soil (162-2)

1.[]	RAPID MICROBIAL DEGRADATION
2.[]	
3.[]	
4.[]	
5.[]	
6.[]	
7.[]	

Aerobic Aquatic (162-4)

1.[]	8-12 DA (SOIL?)
2.[]	
3.[]	
4.[]	

Anaerobic Aquatic (162-3)

1.[]
2.[]
3.[]
4.[]

[*] - Acceptable Study. [#] = Supplemental Study

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ENVIRONMENTAL FATE & GROUND WATER BRANCH
PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY

Page 2

Common Name: ACETOCHLOR

Date: 04/19/89

VOLATILITY STUDIES (163-2,3)

1. ☐ Laboratory:

1. ☐ Field:

DISSIPATION STUDIES (164-1,2,3,5)

Terrestrial Field (164-1)

1. ☐ % ACETOCHL. AND EXTRACT. IN SOIL, AEROBIC CONDITIONS AT 22 C

2. ☐ SOIL DAYS ACETOCHL. ORG. SOL. WAT. SOL. CO2 SOIL BOUND

3. ☐ RAY 0 91.1 97.1 0.8 0.0 1.5

4. ☐ " 21 15.3 24.6 45.0 3.5 62.8

5. ☐ DRUMMER 0 93.8 101.5 0.9 0.0 1.1

6. ☐ " 21 19.8 33.8 37.5 3.2 41.4

Aquatic (164-2)

1. ☐

2. ☐

3. ☐

4. ☐

5. ☐

6. ☐

Forestry (164-3)

1. ☐

2. ☐

Other (164-5)

1. ☐

2. ☐

ACCUMULATION STUDIES (165-1,2,3,4,5)

Confined Rotational Crops (165-1)

1. ☐ DO NOT ROTATE

2. ☐

Field Rotational Crops (165-2)

1. ☐

2. ☐

Irrigated Crops (165-3)

1. ☐

2. ☐

Fish (165-4)

1. ☒ BLUEGILL SUNFISH 35X EDIBLE, 150X VISCERA, 84X WHOLE FISH.

2. ☐ DEPURATION AT 14 DAYS =52%, 90%, 85% FOR EDIB., VISC., WHOLE

Non-Target Organisms (165-5)

1. ☐

2. ☐

[*] - Acceptable Study. [#] = Supplemental Study

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ENVIRONMENTAL FATE & GROUND WATER BRANCH
PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY

Page 3

Common Name: **ACETOCHLOR**

Date: 04/19/89

GROUND WATER STUDIES (158.75)

1. []
2. []
3. []

DEGRADATION PRODUCTS

1. MULTIPLE DEGRADATES. OF THE THREE MAJORS (DERIVATIVES OF
2. METHYL OXANILIC ACID, SULFINYLACETIC ACID, AND SULFOACETANILIDE),
3. NONE ACCOUNTED FOR MORE THAN 18% OF THE ACETOCHLOR APPLIED.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

COMMENTS

References:

Writer : J. HANNAN

ACETOCHLOR ADDENDUM

**Task 1: Review and Evaluation
of Individual Studies**

January 23, 1989

Final Report

Contract No. 68-02-4250

Submitted to:
Environmental Protection Agency
Arlington, VA 22202

Submitted by:
Dynamac Corporation
The Dynamac Building
11140 Rockville Pike
Rockville, MD 20852

DATA EVALUATION RECORD

STUDY 1

CHEM 121601

Acetochlor

\$164-1

FORMULATION—12—EMULSIFIABLE CONCENTRATE (EC)

STUDY ID 40811902

Lottman, C.M. 1988. Terrestrial field dissipation study: Determination of acetochlor residues following preemergent application of Top-Hand herbicide. Laboratory Project ID MSL-8118. Prepared and submitted by Monsanto Agricultural Company, St. Louis, MO.

DIRECT REVIEW TIME = 24

REVIEWED BY: W. Hurtt *W. Hurtt* TITLE: Staff Scientist

EDITED BY: K. Patten *K. Patten* TITLE: Task Leader

APPROVED BY: W. Spangler *W. Spangler* TITLE: Project Manager

ORG: Dynamac Corporation
Rockville, MD
TEL: 468-2500

APPROVED BY: P. Datta
TITLE: Chemist
ORG: EFGWB/EFED/OPP
TEL: 557-9733

SIGNATURE: *PP Datta* 4/14/89

CONCLUSIONS:

Field Dissipation - Terrestrial

This study is scientifically sound and provides supplemental information towards the registration of acetochlor. This study does not fulfill EPA Data Requirements for Registering Pesticides because it could not be determined if acetochlor was stable in soil during frozen storage (the freezer storage stability data were too variable to assess).

SUMMARY OF DATA BY REVIEWER:

Acetochlor (Top-Hand, 7 lb/gal EC), at 2, 4, or 6 lb ai/A, dissipated with a half-life of ≤ 3 days in the upper 3 inches of a sandy loam soil located in California that was treated in July, 1987. At time 0, the measured concentrations of acetochlor were 1.17-1.26 ppm in the plot

treated at 2 lb ai/A, 1.99-2.02 ppm in the plot treated at 4 lb ai/A, and 2.22-2.46 ppm in the plot treated at 6 lb ai/A. The average concentration of acetochlor in all three plots had decreased to 0.039-0.059 ppm by 14 days posttreatment and 0.007-0.014 ppm by 28 days.

Acetochlor did not appear to leach out of the upper 6 inches of soil. In the 2 lb ai/A treatment, acetochlor was detected at a maximum concentration of 0.046 ppm at 3 and 7 days posttreatment in the 3- to 6-inch depth; acetochlor was ≤ 0.009 ppm in the 6- to 9-, 9- to 12-, 12- to 18-, and 18- to 24-inch depths at all sampling intervals. In the 4 lb ai/A treatment, acetochlor was detected at a maximum concentration of 0.041 ppm at 7 days posttreatment in the 3- to 6-inch depth; acetochlor was detected at a maximum 0.031 ppm (3 days) in the 6- to 9-inch depth and was ≤ 0.007 ppm in the 9- to 12-, 12- to 18-, and 18- to 24-inch depths at all sampling intervals. In the 6 lb ai/A treatment, acetochlor was detected at a maximum concentration of 0.159 ppm at 0 days posttreatment and decreased to 0.034 ppm by 1 day in the 3- to 6-inch depth. Acetochlor was a maximum 0.011 ppm (7 days) in the 6- to 9-inch depth and was ≤ 0.009 ppm in the 9- to 12-, 12- to 18-, and 18- to 24-inch depths at all sampling intervals. Acetochlor was not detected in any segments of the 258-day sample that was taken to a depth of 8 feet.

During the first 14 days of the study, an estimated 4 inches of irrigation was received and average daily air temperatures ranged from 64-88°F. During the entire study, irrigation plus rainfall totaled 38 inches (34 plus 4 inches) and average air temperatures ranged from 33 to 88°F.

The concentration of acetochlor in six soils stored frozen (temperature unspecified) for 9-10.1 years ranged from 67 to 126% (average $\approx 90\%$) of the concentration of acetochlor in the soil prior to storage.

DISCUSSION:

1. Although acetochlor was occasionally reported at <0.01 ppm in soil layers deeper than 9 inches, it is unlikely that acetochlor leached into these layers but rather resulted from contamination or background interference. Typically, soil analytical methods have a detection limit of 0.01-0.05 ppm. However, the analytical method used to detect acetochlor is unusually sensitive (values as low as 0.005 ppm are reported) and very little acetochlor would be required to contaminate the sample. Also, the GC tracings provided by the study author indicate that the lower concentrations of acetochlor are barely distinguishable from the background.
2. Based on the concentration of acetochlor in the soil at time 0, the actual application rate was approximately half of the theoretical application rate. An acetochlor concentration of 2, 4, and 6 ppm would be expected in the upper 3 inches of soil that was surface-treated at 2, 4, and 6 lb ai/A (1 acre of soil 3 inches deep weighs ≈ 1 million pounds). However, the measured concentrations of acetochlor were 1.17-1.26, 1.99-2.02, and 2.22-2.46 ppm, respectively, so the time 0 samples did not confirm the application rate. The study author stated that the proposed

maximum label rate is 3 lb ai/A; therefore, if it is assumed the 6 lb ai/A theoretical rate was actually 3 lb ai/A, the study was conducted at the maximum application rate.

3. The freezer storage stability data were too variable to accurately assess. Stability of acetochlor in the frozen sandy loam soil used in the present studies was not determined. However, analyses were performed on soil samples that had been stored frozen for 9-10.1 years. The soils were the time 0 samples from six terrestrial field dissipation studies in which plots had been treated with acetochlor at 4 or 6 lb ai/A. After 9.0 to 10.1 years of frozen storage at an unspecified temperature, recovery ranged from 67 to 126% (average $\approx$ 90%) of the original analyses.
4. The climatological data presented were not from the actual site of the study, but were NOAA data from a "nearby" weather station; the appropriateness of these data to the test site could not be determined. Also, the rainfall, irrigation, and temperature data were presented as graphs and had to be interpreted. The timing of specific rainfall and irrigation events could not be determined. Only mean daily air temperatures, not minimum and maximum temperatures, were reported.
5. The original document submitted by the registrant was poorly organized and therefore difficult to review. Most of the information necessary to assess the study was scattered in footnotes, protocols, amendments to protocols, and field data sheets throughout the 165-page report. In some cases, the information was either not found or was in apparent conflict with the protocol.

MATERIALS AND METHODS

RIN 2556-94

ACETOCHLOR REVIEW (12/601)

Page is not included in this copy.

Pages 13 through 22 are not included.

The material not included contains the following type of information:

- Identity of product inert ingredients.
- Identity of product impurities.
- Description of the product manufacturing process.
- Description of quality control procedures.
- Identity of the source of product ingredients.
- Sales or other commercial/financial information.
- A draft product label.
- The product confidential statement of formula.
- Information about a pending registration action.
- ✓ FIFRA registration data.
- The document is a duplicate of page(s) .
- The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.