~~[illegible]~~
SHAUGHNESSEY NO.

REVIEW NO.

EEB BRANCH REVIEW

1/28/81

DATE: IN 1/8/81 OUT 1/28/81

FILE OR REG. NO.

PETITION OR EXP. PERMIT NO. 524-EUP-LA

DATE OF SUBMISSION 12/5/80

DATE RECEIVED BY HED 1/5/81

RD REQUESTED COMPLETION DATE 2/16/81

EEB ESTIMATED COMPLETION DATE

RD ACTION CODE/TYPE OF REVIEW 701 / Resubmission of EUP

TYPE PRODUCTS(S): I, D,(H,) F, N, R, S Herbicide

DATA ACCESSION NO(S).

PRODUCT MANAGER NO. R. Taylor (25)

PRODUCT NAME(S) Mon 097 (CP 55097); acetochlor

COMPANY NAME Monsanto Company

SUBMISSION PURPOSE EUP for use on corn and soybeans

SHAUGHNESSEY NO.	CHEMICAL, & FORMULATION	% A.I.
	2-chloro-N-ethoxymethyl-N-(2-ethyl-6-methyl phenyl) acetamide	86.4

Mon 097 (CP55097); acetochlor

100 Pesticide Label Information

100.1 Pesticide Use

This Registration action is for an EUP on all types of corn and soybeans. The product is a herbicide.

100.2 Formulation Information

2-chloror-N-ethoxymethyl-N-(2-ethyl-6-methyl phenyl)-acetamide..... 86.4% A.I.
Inert Ingredients..... 13.6%

Contains 8 pounds A.I. per gallon

100.3 Application methods, Directions, Rates

See Attachment from registrants package.

100.4 Target Organism(s)

See "weed list" in attachment from Registrants package.

100.5 Precautionary statement

"Keep out of lakes, streams and ponds. Do not contaminate water by cleaning of equipment or disposal of waste."

101 Physical and Chemical Properties

I. Technical Chemical

1. Names: MON-097 (CP 55097); acetochlor

2. Chemical Identity: Acetamide, 2-chloro-N-ethoxymethyl-N-(2-ethyl-6-methylphenyl)

3. Chemical Structure:

4. Physical and Chemical Properties:

Form: Liquid

Color: Colorless to Dark Purple

B.P.: > 200°C
M.P.: < 0°C
Vapor Pressure: < 1 mm Hg
Hydrolysis Rate: Nondetectable at pH 5-9
Dissociation Constant: None

Solubility: Ether; acetone; benzene chloroform; alcohol; ethyl; acetate; water (233 ppm)

Stability: Stable (first detectable heat evolution at 170°C)

Specific Gravity: 1:11 at 30°C

(from Monsanto Registration Package)

II. 1. Names: Not available yet

2. Physical and Chemical Properties:

a. Miscibility: Emulsifies with water; miscible in all proportions with xylene, alcohols, ketoner, and esters.

b. Boiling Point: > 200°C

c. Flash Point: > 200°F (TCC)

d. Specific Gravity (25/15.6°C): 1.111

e. Viscosity (Centipoise): 58

f. Vapor Pressure: < 1 mm since no solvent is present

g. Corrosion Hazards: None

h. Storage Stability: Data not available but should be between alachlor (1%/yr.) and butachlor (0.7%/yr.) under average warehouse storage.

3. Composition of Formulated Product to be Marketed:

Active Ingredient	%
2-Chloro-N-ethoxymethyl-N-(2-ethyl-6-methylphenyl) acetamide	86.4

Intentionally added Inert Ingredients

[redacted]

INERT INGREDIENT INFORMATION IS NOT INCLUDED

CONTAINS TRADE SECRET OR OTHERWISE CONFIDENTIAL INFORMATION OF MONSANTO COMPANY

102 Behavior in the Environment

EFB has not reviewed their data package as of Jan. 28, 1981; therefore this section cannot be completed.

103 Toxicological Properties

103.1 References from Toxicology Branch

None available as of Jan. 28, 1981

103.2 Minimum Requirements

103.2.1 Avian Acute Oral LD_{50}

This test using Bobwhite Quail had an erratic mortality pattern. It was therefore classified as unacceptable and does not fulfill guideline requirements.

103.2.2 Avian Dietary LC_{50}

1) Eight day dietary LC_{50} for mallard ducks was estimated to be greater than 5620 ppm. The study was classified as acceptable and fulfills guideline requirements.

2) Eight day dietary LC_{50} for Bobwhite Quail was estimated to be greater than 5620 ppm. The study was classified as acceptable and fulfills guideline requirements.

103.2.3 Fish Acute LC_{50}

1) The 96-hour LC_{50} for Bluegill Sunfish was classified as unacceptable, and does not fulfill the guideline requirements.

   (A) The use of aeration without subsequent water analysis was not performed to assure toxicant concentration levels were still available in the test chambers. (B) The "quality controls" in the test are open to question as the loading per container was below the maximum.

   (C) If the study had been acceptable, it would still be rejected as the statistical techniques used to analyze the data were not specifically given.

2) The 96-hour LC_{50} for rainbow trout is probably 0.45 mg/L. This study is unacceptable and will not fulfill the guideline requirements. It is repairable, if the registrant can supply the statistical technique used to analysis the data and if the statistical technique is acceptable for the data.

103.2.4 Aquatic Invertebrates LC_{50}

This Daphnia LC_{50} was classified as unacceptable. It can be repaired if the registrant can adequately explain why the following descrepancies occurred. (A) Why was the range finding results not utilized in setting up the test concentrations? (B) What, specifically, statistical techniques were used to analysis this data?

107 Conclusions

EEBr cannot concur with this EUP. All of the aquatic test and the bird (bobwhite quail) LD_{50} were unacceptable. The lack of Fate and Fish and Wildlife data precluded a hazard assessment. Until EEBr receives usable data, we cannot address endangered species considerations and precautionary or other label changes.

Russel T. Farringer, III
Russel T. Farringer, III
Wildife Biologist
Ecological Effects Branch/HED

Date: 2/10/81

Raymond Matheny
Raymond Matheny 2/10/81
Head, Review Section 1
Ecological Effects Branch/HED

Clayton Bushong, Chief
Clayton Bushong 2/10/81
Ecological Effects Branch/HED

ACETOCHLOR

Page_____ is not included in this copy.

Pages 6 through 43 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.

X 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.

12:621

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JAN 18 1982

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

SUBJECT: PP#1G2454. Acetochlor on corn and soybeans. Comments on the amendment of 10/23/81

FROM: John Worthington, Chemist
Residue Chemistry Branch (TS-769)

TO: Robert Taylor, PM, 25,
Registration Division (TS-767)
and
Toxicology Branch (TS-769)

THRU: Charles L. Trichilo, Chief
Residue Chemistry Branch (TS-769)

The petitioner was informed by Registration Division's letter of 6/8/81 of the following requirements for a favorable recommendation (see also our our memo of 6/2/81):

1. Submission of a final metabolism report including experimental details such as harvest interval, total activity found, portion of the activity extracted, portion of the activity each metabolite represents, ect.

2. Submission of an appropriate ruminant metabolism study.

3. Submission of the individual results of the recovery experiments. If these data do not indicate adequate recovery levels, modification of the proposed method and the development of new residue data with the modified method will also be required.

4. Submission of the appropriate analytical methodology and validation data for soybean processing fractions (soybean hulls, meal, oil and oil soapstock).

5. Unless the proposed use can be categorized under Section 180.6(a)(3), appropriate analytical methods and validation data for the determination of acetochlor residues in milk, eggs, meat and meat byproducts.

6. Proposal of a 0.2 ppm level for soybeans rather than the the 0.4 ppm currently proposed.

7. Either submission of appropriate residue data and proposal of tolerances for residues in corn forage and fodder and soybean forage and hay or the imposition of a label restriction against the feed use of corn or soybean foliage grown in treated soil.

8. A soybean processing fraction study which determines if any acetochlor residues are concentrated in soybean hulls, meal, oil or oil soapstock upon processing.

9. Submission of appropriate cattle and poultry feeding studies to determine if secondary residues will result in meat, milk, poultry or eggs.

In response to Requirement #1 the petitioner has submitted an update on the corn and soybean metabolism experiments. The new submission provides the following additional information.

The corn and soybean plants were grown in ^{14}C and ^{13}C acetochlor treated soil and harvested at maturity (3.5 months and 4.5 months later, respectively). The plant material was divided into grain and foliage fractions, freeze dried, ground and portions combusted to determine total activity. Total activity levels (calculated as acetochlor equivalents) of 26.7 ppm and 34.8 ppm were detected in corn and soybean foliage. Levels of 0.2 and 1.0 ppm were reported in the respective grains. It is likely that the fact the plants were grown in a greenhouse contributed to the the high levels found. Approximately 81 and 89% of the foliage activity, respectively was extracted with 60% aqueous acetone. Only 40 and 70% of the grain activity was solublized with the aqueous acetone. The extracts were separated into neutral, weakly acid, and strongly acidic materials on an ion-exchange column. These fractions were further purified with reverse phase high pressure liquid chromatography, high voltage electrophoresis and acid hydrolysis.

As was discussed in the original report, the extractable metabolites were found to belong to one of four classes of compounds: neutral glucosides(8%), sulfinylacetic acids(4%), oxanilic acids (24%) and sulfonic acids(10%). Similar proportions were found in soybean grain except that the sulfinylacetic acids accounted for almost 20% of the total grain activity.

Eight metabolites accounting for approximately 41% of the total activity found in soybean grain were identified by mass spectrometry (see the attached structural formulas). Additionally 35

more metabolites each present at levels of less than 2% were characterized by the techniques listed above. A similar patern of residue was also evident in soybean grain.

The activity present in corn plants was analyzed using the same techniques employed for soybeans. Four metabolites accounting for approximately 21% of the corn foliage activity were identified by mass spectrometery (see the attached structural formulas). In addition 65 more metabolites each present at levels of less than 2% were also characterized. Corn was shown to have none of the oxanilic acid metabolites which were the major metabolites in soybeans. Corn also lacked the sulfinylacetic acid metabolites but did contain sulfinylacetic acid derivitives instead. Activity levels in the grain were very low (<0.2 ppm) considering the fact that these were greenhouse experiments. Although a variety of extraction techniques were used only 40% of the grain activity could be solublized. Due to the low levels of activity found and recovered, no further analysis of the grain residues was attempted.

Considering the complex nature of the residue, the relatively low levels of residue expected and the fact that acetochlor is an analog of the 2-chloro-2,6-dialkyl-acetanilide herbicides we can now consider the fate of acetochlor adequately delineated for the purpose of the proposed temporary tolerances. We therefore conclude that the residues of concern are acetochlor and its metabolites containing the 2-ethyl-6-methylaniline moiety.

In response to Requirements #2, #5 and #9, the petitioner has asked asked us to consider the low level of residue expected from the proposed use of this relatively non-toxic herbicide. He also points out that acetochlor is an analog of the 2-chloro-2,6-dialkyl-acetanilide herbicides which have been well studied and are widely used. The petitioner therefore argues that it is reasonable to establish temporary tolerances for residues in meat, milk, poultry and eggs by extending our conclusions for the registered acetanilides.

We concur for the purpose of the proposed temporary tolerance; and therefore, recommend that temporary tolerances for residues of acetochlor and its metabolites containing the 2-ethyl-6-methyl-aniline moiety in the milk, eggs, meat and meat byproducts be established at 0.02 ppm. Final resolution of Requirements #2, #5, and #9 may be deferred to the future permanent tolerance request.

In response to Requirement #3 the petitioner indicates the raw validation data was included in the original submission. These data show that recoveries of acetochlor from corn grain fortified at levels of 0.02 to 1.2 ppm ranged from 51 to 89% and averaged 65.2%. The validation data for soybeans inicates that recoveries acetochlor from soybeans fortified at levels of 0.02 to 0.07 ppm

ranged between 48.9 to 84.8% (with the exception of one value at 108%) and averaged 62.4%. We consider the above recovery levels marginally acceptable and can conclude that Requirement #3 has been resolved. The petitioner has informed us that additional studies are in progress to improve the proposed method.

In response to Requirements #4 and #8 the petitioner requests that they be deferred to the future permanent request because of the low levels of residues involved and the fact that acetochlor is an analog of the currently registered 2-chloro-2,6-dialkyl-acetanilide herbicides which have been shown not to concentrate in soybean processing fractions. We can concur with the petitioner's request that Requirements #4 and #8 be deferred for the permanent tolerance request.

In response to Requirement #6 the petitioner has indicated that proposal of a 0.2 ppm tolerance level for soybeans rather than the previously proposed 0.4 ppm level would be acceptable. Contingent upon the petitioner proposing the 0.2 ppm level, we can consider Requirement #6 resolved.

In response to Requirement #7 the petitioner has indicated that such a label restriction is acceptable. Therefore, contingent upon the petitioner amending Section B to include the required restriction we can consider Requirement #7 resolved.

Conclusions

1. The fate of acetochlor on in plants and animals has been adequately delinated for the purpose of the proposed temporary tolerances. Acetochlor, per se, and its metaboltes containing the 2-ethyl-6-methylaniline moiety are the residues of concern.

2. The available analytical methodology is adequate for enforcement of the proposed temporary tolerances.

3a. Contingent upon the petitioner amending Section B to include the required restriction against the feed use of treated foliage, we could recommend for a 0.1 ppm tolerance for residues acetochlor in corn grain and a 0.2 ppm tolerance for residues in soybeans. (The petitioner has concurred that these levels would be appropriate).

3b. Considering the low levels of residues found in soybeans and the fact that acetochlor is an analog of the currently registered 2-chloro-2,6-dialkyl-acetanilide herbicides which have been shown not to concentrate in soybean processing fractions, we are willing to defer the requirements of a soybean processing study and submission of the supporting analytical methodology and validation data for the permanent tolerance request.

4a. Considering the facts that acetochlor is an analog of the 2-chloro-2,6-dialkyl-acetanilide herbicides, which have been well studied and are widely used, and the low level of residues resulting from the proposed use in corn grain and soybeans, we are willing to defer the requirement of ruminant and poultry feeding studies to the future permanent tolerance request.

4b. It is our judgement that the available data adequately support the establishment of temporary tolerances for residues of acetochlor, per se, and its metaboltes containing the 2-ethyl-6-methyl-aniline moiety in meat, milk, poultry and eggs at 0.02 ppm.

Recommendations

1. Contingent upon the petitioner amending Section B to include the required restriction against the feed use of treated foliage and amending Section F to propose tolerances for residues of acetochlor and its metabolites containing the 2-ethyl-6-methylaniline moiety in soybeans at 0.2 ppm and in milk, eggs, and the meat, fat and meat byproducts of cattle, goats,hogs, horses, poultry and sheep at 0.02 ppm (in addition to the 0.1 ppm level currently proposed for corn grain), we could recommend for the establishment of the proposed temporary tolerances.

2. For a future permanent tolerance the following will be required:

   a. Submission of an appropriate ruminant metabolism study.

   b. Submission of the appropriate analytical methodology and validation data for soybean processing fractions (soybean hulls, meal, oil and oil soapstock).

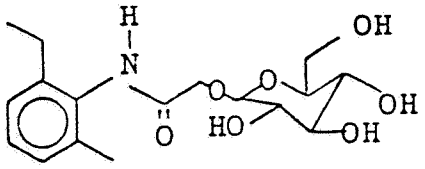
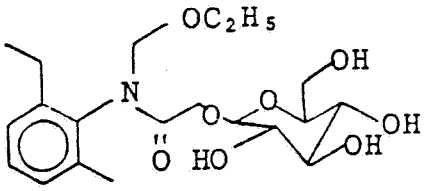
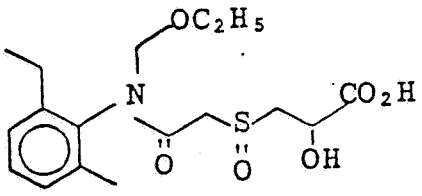
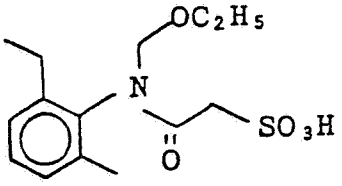
   c. Unless the proposed use can be categorized under Section 180.6(a)(3), appropriate analytical methods and validation data for the determination of acetochlor residues in milk, eggs, meat and meat byproducts.

   d. Submission of appropriate residue data and proposal of tolerances for residues in corn forage and fodder and soybean forage and hay.

   e. A soybean processing fraction study which determines if any acetochlor residues are concentrated in soybean hulls, meal, oil or oil soapstock upon processing.

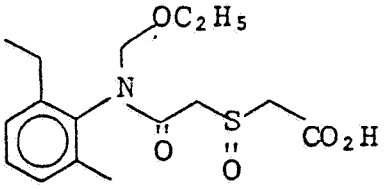
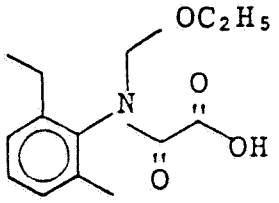
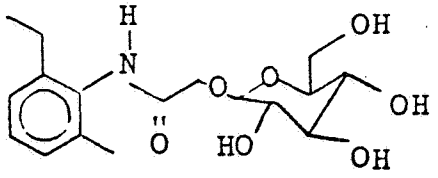
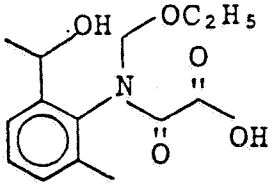
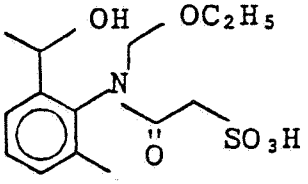
f. Submission of appropriate cattle and poultry feeding studies to determine if secondary residues will result in meat, milk, poultry or eggs.

Table 9. Acetochlor Metabolites Identified in Corn Foliage

Metabolite	% of Foliage Contained Activity*
	9.2
	2.7
	6.1
	2

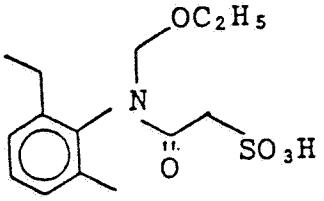
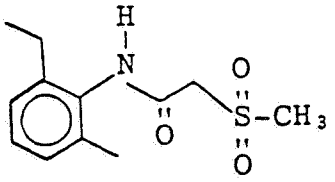
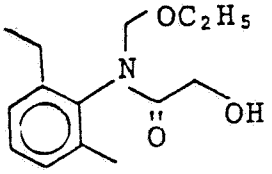
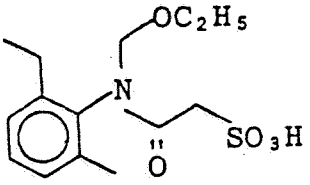
* Expressed as percent of total ^{14}C via combustion analyses.

Table 6. Acetochlor Metabolites Identified in Soybean Grain

	Metabolite	% of Grain Contained Activity*
Positively Identified		13.6
		5.8
Tentatively Identified**		1.8
		12.7
		5.7

* Expressed as percent of total ^{14}C via combustion analyses.
** Based on chromatographic comparisons with metabolites which were identified in the soybean foliage.

Table 6 (con't.)

	Metabolite	% of Grain Contained Activity*
Tentatively Identified		1.2
		1.0
		0.2
		0.7

Date Out EFB: MAR 5 1981

To: Product Manager 25 Tayor
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-EUP-LA

Chemical: Acetochlor

Type Product: Herbicide

Product Name: MON 097

Company Name: Monsanto

Submission Purpose: EUP for use on corn and soybeans

ZBB Code: Sect 5

ACTION CODE: 705

Date in: 1/5/81

EFB # 732

Date Completed: MAR 5 1981

TAIS (level II)	Days
54	8

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

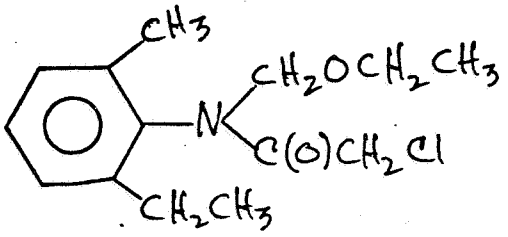
_____ Toxicology Branch

1. Introduction

Chemical Name and Type Pesticide: Acetochlor, 2-chloro-N-ethoxymethyl-N-(2-ethyl-6-methylphenyl)-acetamide, 86.4% a.i., herbicide.

Trade Name: MON-097

Chemical Structure:



Physical and Chemical Properties:

Form: Liquid
Color: Colorless to Dark Purple
B.P. : > 200°C
M.P. : > 0°C
Vapor Pressure: < 1 mm Hg
Hydrolysis Rate: Nondetectable at pH 5-9
Dissociation Constant: None

Solubility: Ether acetone; benzene; chloroform; alcohol; ethyl; acetate; water (223 ppm)

Stability: Stable (first detectable heat evolution at 170°C)

Specific Gravity: 1.11 at 30°C

The applicant requests an experimental use permit for a new herbicide, MON-097, for use on corn and soybeans. The two year request will involve 24,300 pounds active ingredient formulated as an 8 lb ai/gal EC. This amount of material will treat 12,150 acres in 41 states.

2. Directions for Use

See attached sheets.

3. Discussion of Data

ACETOCHLOR

Page_____ is not included in this copy.

Pages 55 through 59 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.

X A draft product label.

____ The product confidential statement of formula.

____ Information about a pending registration action.

____ FIFRA registration data.

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3.1 HYDROLYSIS

The Environmental Studies of Acetochlor, D.H. Campbell and D.E. Hamilton, August 1980, Report # MSL-1255, Acc. # 099814.

Experimental Procedure

Sterile solutions of acetochhlor-carbonyl- ^{14}C at 57.4 ppm were prepared in deionized water, natural water, and commercially available pH 3, 6, and 9 buffers. Sampling was after 7, 14, 21, and 30 days. Samples were extracted with methylene chloride and the water layer analyzed by LSC. The methylene chloride layers were concentrated and assayed by GLC/RAD.

TABLE 1. SOIL DISSIPATION OF ACETOCHLOR UNDER AEROBIC CONDITIONS AT 22°C.

Soil	Days	% Acetochlor	% Organic Solubles	% Water Solubles	% NH_4OH Extractable	% CO_2	% Soil Bound
Ray	0	91.1	97.1	0.8	1.2	0.0	1.5
	21	15.3	24.6	45.0	2.5	3.5	62.8
	168	0.4	5.2	45.7	2.4	21.6	18.7
Drummer	0	93.8	101.5	0.9	0.5	0.0	1.1
	21	19.8	33.8	37.5	4.3	3.2	41.4
	168	0.9	7.6	40.2	4.2	16.2	24.5
Spinks	0	91.7	97.1	1.0	0.1	0.0	7.6
	21	25.5	25.5	28.0	9.1	4.2	34.3
	168	1.3	1.3	33.4	9.8	24.5	17.1

Results

Solutions of acetochlor in deionized water, sterile lake water, and in sterile buffer solutions at pH 3, 6, and 9 did not show any significent degradation. A half-life of greater than 24 months was estimated.

Conclusion

Acetochlor is stable to degradation by hydrolysis. The study satisfies this EC data requirement.

3.2 AEROBIC SOIL METABOLISH

The Environmental Studies of Acetochlor, D.H. Campbell and D.E. Hamilton, August 1980, Report # MSL-1255, Acc. #099814.

Experimental Procedure

The aerobic soil metabolism studies were conducted on three soils: Ray silt loam, Drummer silty clay loam, and Spinks sandy loam. The test apparatus consisted of a 250 ml Erlenmeyer flash and a two-piece trapping tower made up of ascarite and Drierite. Fifty grams of air dried soil was treated with enough radiolabeled acetochlor to give a 3 ppm dosage rate (about normal use rate). Incubation was at 22°C in the dark. Duplicate flasks (viable and sterile) were sampled after 0, 1, 3, 7, 14, 21, and 28 days. Flasks of viable soil were also sampled to 56, 84, and 168 days. Soils were extracted with aqueous acetonitrile, ammonium hydroxide, water and methylene chloride and analyzed by LSC and HPLC.

Results

The extraction, combustion, and CO_2 evalution data (Table 1) indicate:

1. A steady evolution of CO_2 (0.7-1.0% per week).

2. The level of organic solubles (methylene chloride extraction) decreased.

3. Water soluble and soil-bound material first increased and then dropped off.

Under aerobic conditions in viable soil at 22°C the half life of acetochlor in Ray soil was 8 days, in Drummer soil 10 days, and in Spinks soil 12 days. Data from the sterile soil studies indicated that microbial metabolism is the dominant degradative pathway for acetochlor in soil.

Many metabolites were identified in the study; a total of 19 in all. All three significant metabolites were unambiguously identified. These were derivatives of methyloxanilic acid, sulfinylacetic acid, and sulfoacetanilide. Despite being the most significant metabolites, none accounted for more than 18% of the applied acetochlor. Sixteen other metabolites that were either minor, very minor, or noted at the end of the study were detected and identified.

Conclusion

Acetochlor degrades fairly rapidly in aerobic soil yielding many metabolites. The study satisfies this EC data requirement.

The preceeding two studies are required for an experimental use permit. The following studies are not required and will only be briefly summarized here. A more complete review will be done when acetochlor is submitted for full registration.

3.3 ADSORPTION

Part of environmental studies. See section 3.1

Soil adsorption and desorption of acetochlor were studied using Lintonia, Ray, Spinks and Drummer soils having % O.M. of 0.7, 1.2, 2.4, and 3.4, respectively. Soils with a higher organic content bound acetochlor more tightly than those with lower organic content. The four soils above had adsorption coefficients of 0.4, 1.1, 1.6, and 2.7.

3.4 SOIL LEACHING

Part of environmental stuides. See section 3.1.

Soil column studies of aged and unaged soils reflected the correlation between % O.M. and adsorption previously seen, e.g., Drummer soil (3.4% O.M) retained about 57% of the applied acetochlor, whereas Lintonic soil (0.7% O.M.) retained only 4% of applied acetochlor. Drummer and Spinks soils were of intermediate mobility (Helling and Turner). Ray soil was classified mobile and Lintonia as very mobile.

3.5 OCTANOL/WATER PARTITION COEFFICIENT

Part of environmental studies. Se section 3.1

The coefficients from two experminents gave relatively low values of 313 and 286, neither of which indicate much bioaccumulation in fatty tissues.

3.6 ANEROBIC SOIL METABOLISM

Part of environmental studies. See section 3.1

The authors concluded that rapid microbial degradation occurs under anaerobic conditions and the products formed aerobically continue to be broken down to a wide array of products.

4.0 Executive Summary and Conclusions

Acetochlor was stable to hydrolysis. Acetochlor degraded rapidly in a variety of soils under both aerobic and anaerobic conditions and produced a large number of metabolites. Soil adsorption and column leaching studies indicated that in soils with higher organic matter content (3.4%) acetochlor was of intermediate mobility and in soils with lower organic matter content (0.7%) acetochlor was very mobile.

5.0 Recommendations

EFB concurs with the use of acetochlor under the proposed experimental use permit, but since a rotational crop study was not submitted, the following qualifications or alternatives must apply:

1. On 18-month crop rotation restriction must be placed on the label, or

2. A crop destruct policy put into effect, or

3. A rotational crop study submitted along with a request for tolerances on rotational crops.

A statement is required on the label that the treated area should not be grazed or crops fed as forage to livestock.

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