DP Barcode: D168373,D165550
PC#: 114402
Date Out of EFGWB:
JAN 7 1992

TO: Christine Rice
Product Manager # 52
Registration Division (H7505C)

FROM: Akiva Abramovitch, Ph.D., Chief
Review Section #3
OPP/EFED/EFGWB (H7507C)

THROUGH: Henry Jacoby, Chief
OPP/EFED/EFGWB (H7507C)

Henry Jacoby

Attached, please find the EFGWB review of:

Submission/Case#: S398104/816452; S402128/816452

Common Name : Acifluorfen

Chemical Name : Sodium 5-(2-chloro-4-(trifluoromethyl)phenoxy-2-nitrobenzoate

Product Type : Herbicide

Product Name : Blazer, Galaxy, Storm

Company Name : BASF

Purpose : Phase V review of an aqueous photolysis study and a response to a time extension for an aquatic dissipation study.

Date Received: 9/10/91 **EFGWB #(s):** 91-0699, 91-0925

Date Completed:

Total Reviewing Time:

Deferrals to: _____Ecological Effects Branch/EFED

_____Science Integration & Policy Staff/EFED

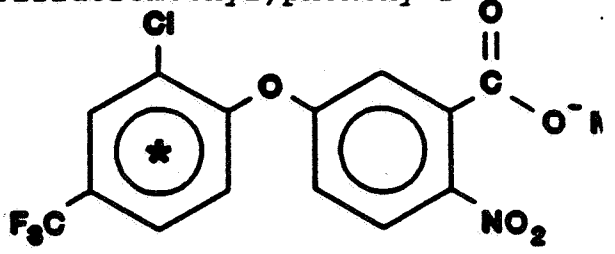
_____Occupation, Residential; Exposure Branch/HED

_____Dietary Exposure Branch/HED

_____Toxicology Branch I, II/HED

1. CHEMICAL:
Common Name: Acifluorfen

Chemical Name: Sodium 5-(2-chloro-4-(trifluoromethyl)phenoxy-2-nitrobenzoate



Type of product: Herbicide

Chemical Structure:

Physical/Chemical Properties
molecular weight: 383.70
aqueous solubility: 2.50×10^{5} ppm at 20.0°C
vapor pressure: 7.5×10^{-8} torr

2. TEST MATERIAL:
See the attached DERS.

3. STUDY/ACTION TYPE: Phase V review of an aqueous photolysis study and a response to a time extension of an aquatic dissipation study.

4. STUDY IDENTIFICATION:

(1) Letter from Karen R. Blundell, Senior Registration Specialist, BASF Corporation, Agricultural Chemicals, Agricultural Research Center, P.O. box 13528 Research Triangle Park, N.C. 27709. Concerning a time request for an aquatic field dissipation study.

(2) MRID No: 41891208; Mary G. Panek, May 23, 1991. Aqueous Photolysis of ^{14}C-Sodium Acifluorfen. Performing laboratory: BASF Corporation, Agricultural Chemicals, Agricultural Research Center, P.O. box 13528 Research Triangle Park, N.C. 27709. Submitted by BASF Corporation Agricultural Chemicals. Protocol No. M9024, Report No. M9118.

5. REVIEWED BY:
Kevin L. Poff, Chemist
Environmental Chemistry Review Section #3
Environmental Fate and Groundwater Branch/EFED
Date: DEC 19 1991

6. APPROVED BY:
Akiva Abramovitch, Ph.D., Chemist
Environmental Chemistry Review Section #3
Environmental Fate and Groundwater Branch/EFED
Date: DEC 19 1991

7. CONCLUSIONS:

Letter from Karen R. Blundell, BASF Corporation, concerning a time request for an aquatic field dissipation study (164-2):

(1) EFGWB grants the time extension for the completion of the aquatic field dissipation (164-2) data requirement for sodium acifluorfen.

Photodegradation in Water (161-2) (DER 1)

(1) Study MRID #41891208 does not satisfy the aqueous photolysis (161-2) data requirement for sodium acifluorfen for the following reasons:

a) 50% of the applied radioactivity described as polar material went uncharacterized and unquantified.

b) Only one of the two phenol rings (the trifluoromethyl phenol ring) was labeled.

8. RECOMMENDATIONS:
Inform the registrant that a new photodegradation in water (161-2) study needs to be submitted and that EFGWB grants the time extension for the aquatic field dissipation (164-2) study.

The following is a summary of environmental fate data requirements for sodium acifluorfen:

Satisfied:

161-1. Hydrolysis. MRID# 107479/(Acc#095735), EFGWB# 3422, Stable from pH 4.5 to 9.7.
162-1. Aerobic soil metabolism. Acc. No. 254534;MRID# 00143572, EFGWB# 4554 11/7/84. t1/2= 170 days, parent was present at 43% after 6 months of aerobic incubation.

Not Satisfied:
161-2. Photodegradation in water.
161-3. Photodegradation on soil.
162-2. Anaerobic soil metabolism. (or the anaerobic aquatic metabolism (162-3) study)
162-3. Anaerobic aquatic metabolism.
162-4. Aerobic aquatic metabolism.
163-1. Leaching/Adsorption/Desorption.
164-1. Terrestrial field dissipation.
164-2. Aquatic field dissipation.
165-1. Accumulation in confined rotational crops.
165-3. Accumulation in irrigated crops.

Reserved:
164-5. Long term terrestrial field dissipation.
165-2. Accumulation in field rotational crops.
167-1. Field runoff.
167-2. Surface water monitoring.

Waived:
162-2. Laboratory volatility (low vapor pressure, March 22, 1991, transmittal of List B memorandum).
162-3. Field volatility (low vapor pressure, March 22, 1991, transmittal of List B memorandum).

161-4. Photodegradation in air. (low vapor pressure, March 22, 1991, transmittal of List B memorandum).
165-4. Bioaccumulaiton in fish. (low K_{ow}, March 22, 1991, transmittal of List B memorandum).
165-5. Accumulation in aquatic non-target species. (low K_{ow}, March 22, 1991, transmittal of List B memorandum).

ENVIRONMENTAL FATE ASSESSMENT

The available data is insufficient to provide a comprehensive environmental fate assessment on sodium acifluorfen, however, limited data indicate sodium acifluorfen may be persistent.

9. BACKGROUND :

Sodium acifluorfen is a selective herbicide that is used on Terrestrial Food Crops; peanuts and soybeans, Terrestrial Non-Food Crop, and Outdoor residential for mulch; ornamental shade trees, herbaceous plants, lawns or turf, and woody shrubs or vines. Aquatic Food Crop for rice.
Use rates: peanuts- 0.5 lb/A, soybeans- 0.75 lb/A, rice- 0.25 lb/A.

10. DISCUSSION:
See attached DERS.

11. COMPLETION OF ONE-LINER:
Attached.

12. CBI INDEX:
Not applicable.

DATA EVALUATION RECORD
(DER 1)

SHAUGHNESSY No. 114402
COMMON NAME: Acifluorfen
CHEMICAL NAME: Sodium 5-(2-chloro-4-(trifluoromethyl)phenoxy-2-nitrobenzoate
FORMULATION: Active Ingredient
DATA REQUIREMENT: 161-2 Photolysis in Water

MRID No: 41891208; Mary G. Panek, May 23, 1991. Aqueous Photolysis of ^{14}C-Sodium Acifluorfen. Performing laboratory: BASF Corporation, Agricultural Chemicals, Agricultural Research Center, P.O. box 13528 Research Triangle Park, N.C. 27709. Submitted by BASF Corporation Agricultural Chemicals. Protocol No. M9024, Report No. M9118.

REVIEWED BY: Kevin L. Poff
Chemist EFGWB/EFED
Signature: K L Poff
Date: 12/19/91

APPROVED BY: Akiva Abramovitch, Ph.D.
Chemist EFGWB/EFED
Signature:
Date:

CONCLUSIONS:

(1) Study MRID #41891208 does not satisfy the aqueous photolysis (161-2) data requirement for sodium acifluorfen for the following reasons:

a) 50% of the applied radioactivity described as polar material went uncharacterized and unquantified.

b) Only one of the two phenol rings (the trifluoromethyl phenol ring) was labeled.

MATERIALS AND METHODS:

^{14}C-sodium acifluorfen, (obtained by neutralization of acifluorfen) labeled in the phenyl ring bearing the trifluoromethyl group, specific activity 14.72 mCi/mM, radiochemical purity 98.4%, chemical purity 98.8%, was added to a pH 7 phosphate buffer to achieve a concentration of 18.1 ppm. The light source was a Xenon arc lamp equipped with a quartz filter to adsorb radiation below 290 nm. The light intensity was 1900 uEinsteins-m^2s^{-1} corresponding to the natural light intensity of the Research Triangle Park area of 2150 and 1950 uEinsteins-m^2s^{-1} taken on two different noon-time measurements. Irradiation was for twelve-hour intervals interposed with twelve hours of darkness. The spectral distribution and intensity of radiation from 270-800 nm were made at the test vessel. There was a comparison of energy spectra between the artificial light and natural light at the site of the experiment. The test vials were incubated at 25.0^{0}C $\pm$ 1^0. Volatiles were collected after irradiation at 12, 24, 36, 48, 60, 72 and 84 hours. Duplicate samples were taken at time 0, and after irradiation at 12, 24, 36, 48, 60, 72 and 84 hours.
The photolysis experiment was terminated after 84 hours.

RESULTS:

Table 3 and 4 represents average percent acifluorfen in the sample solution at sampling time and the data used in half-life calculations. Table 9 shows the material balance during the experiment. Figure 4 shows spectral energy distribution and comparison to natural light. Figure 6 shows the UV-Vis spectrum of ^{14}C-sodium acifluorfen in 0.025 M phosphate buffer at pH 7.

The findings of the study are as follows:

(1) The calculated photolytic half-life of ^{14}C-sodium acifluorfen in 0.025 M phosphate buffer at pH 7, 25.0^{0}C $\pm$ 1^0 was 21.7 hours.

(2) ^{14}C-sodium acifluorfen in 0.025 M phosphate buffer at pH 7, 25.0^{0}C in the dark was stable.

(3) Acidic polar material comprised the bulk of the photodegradation products accounting for 45% of the initial radioactivity at 48 hours.

(4) Mineralization, to $^{14}CO_2$, accounted for 8.6% of initial radioactivity at 48 hours and 18% of initial radioactivity after 84 hours. Organic volatiles accounted for 1.6% of the initial radioactivity after 84 hours.

(4) Material balance was 89.7% under irradiated conditions after 84 hours.

DISCUSSION:

1. After 48 hours of the experiment polar materials accounted for greater than 50% of the applied radioactivity. This material has to be identified and quantified in order to determine the photolytic fate of sodium acifluorfen.

2. Only 1 of the phenyl rings were labeled and followed throughout the experiment. The fate of the unlabeled ring needs to be addressed.

3. One of the initial degradation products was decarboxylated acifluorfen, 4-[2-chloro-(4-trifluoromethyl)phenoxy]nitrobenzene; identified by TLC cospotting with a reference was mentioned, but not quantitated.

Acifluorfen

Page _____ is not included in this copy.

Pages __7__ through _21__ are not included in this copy.

The material not included contains the following type of information:

_____ Identity of product inert ingredients.

_____ Identity of product inert impurities.

_____ Description of the product manufacturing process.

_____ Description of product 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

__X__ 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.

BASF Corporation

BASF

August 29, 1991

Mr. Thomas Luminello
ENVIRONMENTAL PROTECTION AGENCY
Office of Pesticide Programs (H7508C)
Special Review and Reregistration
Crystal Mall, Building 2
1921 Jefferson Davis Highway
Arlington, VA 22202

Agricultural Chemicals

Subject: Request for Time Extension for
Aquatic Dissipation Study (Guideline 164-2)

Reference: Sodium Acifluorfen
Case No. 2605, Chemical No. 114402

Dear Mr. Luminello:

In a recent telephone conversation, I explained to you that, much to my concern, I recently realized that BASF had never received a time extension for the Subject study, even though we have been reporting in our last several progress reports that we plan to submit the Aquatic Dissipation study in May, 1994.

I apologize for my oversight in this matter and respectfully request that you grant BASF a time extension for the aquatic dissipation study based on the fact that the results from two aquatic metabolism studies, which are currently in progress, are needed before analyses for the dissipation study can be carried out. A copy of a Request for Time Extension has been attached for your review.

Thank you for your attention to this matter. Please call me at (919) 361-5479 if you have any questions or comments on the request.

Sincerely,

BASF CORPORATION
Agricultural Products Group

Karen R. Blundell

Karen R. Blundell
Senior Registration Specialist

KRB/ksw

enclosures

cc: J.R. Graham, BASF
file

kb3/lmnll6.mm

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BASF CORPORATION
Agricultural Products Group
P.O. Box 13528
Research Triangle Park, NC 27709-3528

REQUEST FOR TIME EXTENSION

Case Name	:	Sodium Acifluorfen
Case Number	:	2605
Chemical Name	:	Sodium 5-2[2-chloro-4-(trifluoromethyl)-phenoxy]-2-nitrobenzoate
Chemical Number:		114402

164-2 AQUATIC FIELD DISSIPATION

BASF Corporation has declared the following guideline requirements to be data gaps for sodium acifluorfen under FIFRA '88:

162-3 Anaerobic Aquatic Metabolism

162-4 Aerobic Aquatic Metabolism

Since we cannot appropriately analyze for residues of sodium acifluorfen in an aquatic field dissipation study without the results of the referenced aquatic metabolism studies, we respectfully request a time extension for the completion of the aquatic dissipation study. The metabolism studies will be submitted to the Agency in 1992. We therefore request that a due date of May 25, 1994, be granted for the aquatic dissipation study.

Environmental Fate & Effects Division
PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY
ACIFLUORFEN, SODIUM SALT
Last Update on November 26, 1991
[V] = Validated Study [S] = Supplemental Study [U] = USDA Data

LOGOUT	Reviewer:	Section Head:	Date:

Common Name:ACIFLUORFEN, SODIUM SALT
PC Code # :114402 CAS #:62476-59-9 Caswell #:

Chem. Name :5-[2-CHLORO-4-(TRIFLUOROMETHYL)-PHENOXY]-2-NITRO-
BENZOIC ACID, SODIUM SALT
Action Type:Herbicide

Trade Names:TACKLE; BLAZER
(Formul'tn):2 LC
Physical State:

Use :BROADLEAF WEEDS/GRASSES IN SOYBEANS
Patterns :
(% Usage) :
:

Empirical Form: $C_{14}H_6O_5F_3NaN$
Molecular Wgt.: 383.70 Vapor Pressure: 7.50E -8 Torr
Melting Point : 163-4 c °C Boiling Point: °C
Log Kow : pKa: 2.50 @ °C
Henry's : E Atm. M3/Mol (Measured) 1.51E-13 (calc'd)

Solubility in ...					Comments
Water	2.50E	5	ppm	@20.0 °C	
Acetone	E		ppm	@ °C	
Acetonitrile	E		ppm	@ °C	
Benzene	E		ppm	@ °C	
Chloroform	E		ppm	@ °C	
Ethanol	E		ppm	@ °C	
Methanol	E		ppm	@ °C	
Toluene	E		ppm	@ °C	
Xylene	E		ppm	@ °C	
	E		ppm	@ °C	
	E		ppm	@ °C	

Hydrolysis (161-1)
[V] pH 5.0:>56 DAYS
[V] pH 7.0:>56 DAYS
[V] pH 9.0:>56 DAYS
[V] pH 3.0:>28 DAYS EVEN AT 40 C
[ ] pH :
[ ] pH :

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Photolysis (161-2, -3, -4)
[S] Water:92 HRS CONTINUOUS EXPOSURE
[ ] :TO UV @ 40-45 C
[ ] :
[ ] :

[ ] Soil :57 DAYS pH4
[ ] Air :

Aerobic Soil Metabolism (162-1)
[V] 1 MONTH SaLm
[V] 2-6 MONTHS SiLm
[V] APPROX. 170 DAYS IN LOAM
[V] 59 DAYS IN MISSISSIPPI SiLm
[S] 6 DAYS IN NEW JERSEY LmSd
[U] 14 days
[ ]

Anaerobic Soil Metabolism (162-2)
[ ]
[ ]
[ ]
[ ]
[S] <28 DAYS IN N.J. LmSd
[ ]
[ ]

Anaerobic Aquatic Metabolism (162-3)
[ ]
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Aerobic Aquatic Metabolism (162-4)
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Environmental Fate & Effects Division
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ACIFLUORFEN, SODIUM SALT
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Soil Partition Coefficient (Kd) (163-1)
[S] Kd, NEW JERSEY SiLm = 1.0
[ ]
[ ]
[ ]
[ ]
[ ]

Soil Rf Factors (163-1)
[ ] >.83 SiLm 3.8 %OM
[ ] >.83 SiLm 2.7 %OM
[ ] >.83 SaLm 2.1 %OM
[ ] >.83 Sa 0.95%OM
[ ] >.83 ClLm 1.9 %OM
[ ]

Laboratory Volatility (163-2)
[V] <1% VOLATILIZED UNDER AEROBIC CONDITIONS IN 3 MONTHS
[ ]

Field Volatility (163-3)
[ ]
[ ]

Terrestrial Field Dissipation (164-1)
[S] IN IRRIGATED WISCONSIN SAND SOIL, T1/2= 0.5 MONTH; WITHIN
[ ] 2 MONTHS, TOTAL RESIDUE DECLINED TO NEAR DETECTION LIMIT.
[S] IN SiLm IN MISSISSIPPI, T1/2= ABOUT 59 DAYS; THOUGH RAIN-
[ ] FALL FOR 3 MONTHS WAS 14.9", THERE WAS NO LEACHING BELOW
[ ] 3" IN THE SOIL.
[ ]
[ ]
[ ]
[ ]
[ ]

Aquatic Dissipation (164-2)
[ ] 1 DAY (SITE NOT GIVEN)
[ ]
[ ]
[ ]
[ ]
[ ]

Forestry Dissipation (164-3)
[ ]
[ ]

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Environmental Fate & Effects Division
PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY
ACIFLUORFEN, SODIUM SALT
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[V] = Validated Study [S] = Supplemental Study [U] = USDA Data

Long-Term Soil Dissipation (164-5)
[ ]
[ ]

Accumulation in Rotational Crops, Confined (165-1)
[S] ACCUM. OF C14 IN ROTATIONAL CROPS PLANTED 1 MONTH
[ ] AFTER SOIL TREATMENT WAS BETWEEN <.02 AND 1.05 PPM

Accumulation in Rotational Crops, Field (165-2)
[ ]
[ ]

Accumulation in Irrigated Crops (165-3)
[ ]
[ ]

Bioaccumulation in Fish (165-4)
[ ] BLUEGILL SUNFISH: AT END OF 30 DAY EXPOSURE TO 3.4 MG/L,
[ ] BCF= 1.1, 0.3, AND 1.9 X FOR WHOLE, FILLET, AND VISCERA

Bioaccumulation in Non-Target Organisms (165-5)
[ ]
[ ]

Ground Water Monitoring, Prospective (166-1)
[ ]
[ ]
[ ]
[ ]

Ground Water Monitoring, Small Scale Retrospective (166-2)
[ ]
[ ]
[ ]
[ ]

Ground Water Monitoring, Large Scale Retrospective (166-3)
[ ]
[ ]
[ ]
[ ]

Ground Water Monitoring, Miscellaneous Data (158.75)
[ ]
[ ]
[ ]

Field Runoff (167-1)
[ ]
[ ]
[ ]
[ ]

Surface Water Monitoring (167-2)
[ ]
[ ]
[ ]
[ ]

Spray Drift, Droplet Spectrum (201-1)
[ ]
[ ]
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[ ]

Spray Drift, Field Evaluation (202-1)
[ ]
[ ]
[ ]
[ ]

Degradation Products

In aerobic soil test, major residue was parent compound, accounting for >40% after 6 months.
Major metabolite in anaerobic soil test was the acetamide of the amino analog of acifluorfen.
In photodegradation study, numerous degradates were formed, but none more than 10% of the original.

Koc = 113 estimate (U)

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Environmental Fate & Effects Division
PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY
ACIFLUORFEN, SODIUM SALT
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Comments

Dissociates in H2O to free acifluorfen acid (stable).
Photodegrades in H2O (t1/2=2wks) and on soil (t1/2=57d);cleavage of diphenyl ether bond is principal route in sunlight.
Aerobic degradation t1/2=1-6 mo; anaerobic degradation t1/2=1wk.
Little effect on soil microbes. Free acid readily leaches; other degradation products do not leach. No field leaching was evident below 6" soil depth. Degradation in the field t1/2= 2-7 wks.
Highly mobile: After appl of 682 lb. AIA, amt leached from columns with 10" water = 79-93% of that applied.

References: FARM CHEM. HDBK.; EPA REVIEWS
Writer : PJH