to file

Issue

Shaughnessy No.: 129016

Date out of EFGWB: FEB 22 1991

TO: J. Miller/S. Robins
Product Manager #23
Registration Division (H7507C)

FROM: Emil Regelman, Supervisory Chemist
Chemistry Review Section #2
Environmental Fate and Ground Water Branch

THRU: Hank Jacoby, Chief
Environmental Fate and Ground Water Branch
Environmental Fate and Effects Division (H7507C)

Attached, please find the EFGWB review of ...

Reg./File #: 62719-EUP-RG formerly 464-EUP-RNG

Chemical Name: N-(2,6-difluorophenyl)-5-methyl-1,2,4-triazolo[1,5a] pyrimidine-2-sulfonamide

Type Product: Herbicide

Common Name: XRD-498; XRM-5019

Company Name: DowElanco Chemical Company

Purpose: Addendum to application for corn and soybean Experimental Use Permit

Date Received: 5 Feb. 1991 Date Completed: 7 Feb. 1991

Action Code: 701

EFGWB #(s): 91-~~0378~~ 0357

Total Reviewing Time: 0.8 days

Deferrals to: ___ Ecological Effects Branch, EFED

___ Science Integration and Policy Staff, EFED

___ Non-Dietary Exposure Branch, HED

___ Dietary Exposure Branch, HED

___ Toxicology Branch

Jael
Got the nice
review. Keep
up the good work.
PS Thanks for getting it
back so quickly

1. CHEMICAL:

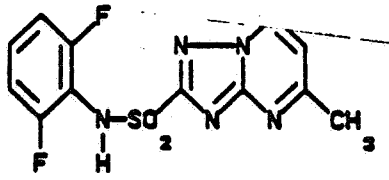
Chemical name: N-(2,6-difluoroph
pyrimidine-2-sul

CAS no.: 98967-40-9

Common name: XRD-498; XRM-50

Trade name: DR-0238-5651/K-

Chemical structure:



Formulation: N-(2,6-difluorophenyl)-5-methyl(1,2,4)triazolo[1,5a]
pyrimidine-2-sulfonamide.....74.9%
Inert Ingredients.....25.1%

Physical/Chemical properties of active ingredient:

Physical characteristics: Light tan power

Molecular formula: $C_{12}H_9F_2N_5O_2S$

Molecular weight: 325.3

Melting point: 253°C

Vapor Pressure: 0.8×10^{-15} mm Hg at 20°C

Solubility: 49.1 mg/L at pH 2.5 (25°C)
5.65 g/L at pH 7.0 (25°C)

Octanol/water partition coefficient: = 1.62

2. TEST MATERIAL:

Active ingredient

3. STUDY/ACTION TYPE:

Addendum to application for corn and soybean Experimental USe Permit.

4. STUDY IDENTIFICATION:

Vatne, R.D. CORRESPONDENCE WITH J. MILLER: XRM-5019 HERBICIDE (ACTIVE INGREDIENT -- XRD-498 OR DE-498) EXPERIMENTAL USE PERMIT FILE SYMBOL 62719-EUP-RG. Submitted by DowElanco Chemical Company, Midland, MI; Received by EPA 19 Jan. 1991.

5. REVIEWED BY:

Gail Maske
Chemist, Review section #2
OPP/EFED/EFGWB

Signature: _____
Date: _____

6. APPROVED BY:

Emil Regelman
Supervisory Chemist
Review section #2
OPP/EFED/EFGWB

Signature: _____
Date: FEB 22 1991

7. CONCLUSIONS:

Based on the low concentration of the degradates (<0.01 ppm and <10% of applied) found in the 5-triazolopyrimidine and phenyl labelled XRD-498 aerobic soil metabolism studies, the registrant is requesting a waiver of the aged mobility data requirement. Furthermore, based on the waiver of the aged mobility data requirement completing the Environmental Fate Data Requirements for a terrestrial food EUP, the registrant is requesting a two year EUP for XRD-498 use on corn and soybeans.

An aerobic soil metabolism study using 5-triazolopyrimidine-labelled [^{14}C]-XRD-498 was acceptable (WGM;02/02/90) to fulfill the data requirement for a terrestrial food EUP and partially fulfills the data requirement for registration. An aerobic soil metabolism study using phenyl-labelled XRD-498 is required to fulfill this data requirement for registration. The registrant has indicated that the phenyl-labelled [^{14}C]XRD-498 study has been completed and is in the process of being edited and being submitted to the Agency for review. In this package the registrant states that for the phenyl labelled portion of the aerobic soil metabolism study, all degradates were below 0.01 ppm and 10% of applied. The initial concentration of XRD-498 applied in the phenyl and triazolopyrimidine labelled studies was an exaggerated application rate (2X to 3X). Therefore, the concentrations of the degradates should not reach significant concentrations in the environment.

Based on the degradates not being of toxicological concern at this time (verbal conversation with E. Doyle; 7 February 1991), the low concentration of the degradates, and the limited area of the EUP request, there is sufficient data to support the EUP for XRD-498 on corn and soybeans for one year and a conditional EUP for the 2nd year. The conditional 2nd year EUP is pending completion of acceptable aerobic (phenyl labelled ring) soil metabolism and anaerobic (triazolopyrimidine and phenyl labelled rings)

soil metabolism studies and reevaluation of the environmental fate of XRD-498. The 2nd year EUP request for use of XRD-498 on corn and soybeans should be resubmitted at the completion of these data requirements. The request for waiver of the aged mobility data requirement is deferred until completion of the above studies, as well.

8. RECOMMENDATIONS:

a. There is sufficient environmental fate data to support the request for an EUP for XRD-498 on corn and soybeans for one year. The 2nd year EUP request is conditionally supported pending completion of acceptable aerobic soil metabolism (phenyl labelled ring) and anaerobic soil metabolism (triazolopyrimidine and phenyl labelled rings) and reevaluation of the environmental fate of XRD-498.

b. The request for waiver of the aged mobility data requirement is deferred until the aerobic soil metabolism and anaerobic soil metabolism data requirements are fulfilled.

c. The status of the Environmental Fate Data Requirements for an experimental use (terrestrial food crop) permit is as follows:

Environmental Fate Data Requirement	Status of Data Requirement	MRID No.
Degradation Studies-Lab		
161-1 Hydrolysis	Fulfilled (WGM;02/02/90)	41263229
Metabolism Studies-Lab		
162-1 Aerobic soil	Partially (WGM;06/22/90) Satisfied for EUP	41263230
Mobility Studies		
163-1 Leaching, Adsorption/ Desorption	Fulfilled for unaged (WGM;06/22/90) Deferred for aged	41263231 41290403
Accumulation Studies		
165-1 Rotational crops-confined	Not required for EUP[1] (WGM;02/02/90)	41263232
165-4 in Fish	Waived (WGM;06/22/90)	

[1] The rotational crops data are not required for crop destruct EUP's. However, supplemental data has been submitted and a new study will be submitted in August 1991.

9. BACKGROUND:

General Background

XRD-498 is a selective herbicide proposed for use to control broadleaf weeds in soybeans and field corn. The single active ingredient formulations is 75% G. XRD-498 may be applied using preplant incorporation, preemergence, or postemergence treatment. Proposed application rates are 0.03-0.13 lb ai/A for preplant incorporation and preemergence treatment; postemergence rates on field corn are 0.015-0.062 lb ai/A, and postemergence rates on soybeans are 0.0078-0.015 lb ai/A. Application is by ground spray; sufficient agitation should be maintained during mixing and spraying to ensure a uniform spray mixture. When applied by preplant incorporation,

XRD-498 should be incorporated into the top 2 to 3 inches of the final seedbed. Preemergence and postemergence applications are made by broadcast spraying. Livestock should not be allowed to graze in treated areas, and harvest-treated silage or grain should not be fed to meat or dairy animals.

Environmental Fate Background

Degradation

[^{14}C]XRD-498 did not hydrolyze in sterile aqueous pH 5, 7, 9 buffered solutions incubated in the dark at 25°C for 66 days. [^{14}C]XRD-498, present in all solutions at $\geq$ 99%, was the sole compound identified in the buffer solutions at all sampling intervals.

Metabolism

5-Triazolopyrimidine-labelled [^{14}C]XRD-498 degraded with half-lives of 23, 60, 93, 102 days in sandy loam, clay, silt loam, and loam soils, respectively. Six unidentified degradates were each isolated at up to 3.4% of the applied [^{14}C]XRD-498 (<0.01 ppm and/or 10% of applied). At 371-382 days posttreatment $^{14}CO_2$ comprised 34.5 - 53.3% of the applied radioactivity. An aerobic soil metabolism study of the phenyl-labelled [^{14}C]XRD-498 is required to fulfill the data requirement for registration.

Mobility

[^{14}XRD-498 was determined to be very mobile in twenty-three soils ranging in texture from sandy loam to clay. The adsorption coefficients (K_d) were 0.05 to 2.42, and K_{oc} values were 5 to 182. It appeared that adsorption increased with decreasing pH, with increasing half-life, and with increasing soil organic matter content. Freundlich K_{des} values were determined to be 0.15 to 0.57, and corresponding K_{oc} values were 14 to 25 in silt loam, sandy loam, clay, and loam soils. Mobility of degradates have not been addressed.

10. DISCUSSION:

A total of 15 states which represent a broad range of growing conditions, cultural practices, soil types, and weed problems will be used to evaluate XRD-498 for preplant incorporation, preemergence and/or postemergence application to soybeans or field corn for control of broadleaf weeds. XRD-498, the active ingredient of XRM-5019, has shown a high level of activity on many broadleaf weeds that are common problems in soybeans and field corn with minimal activity on the crop.

The proposed used rates for evaluation as a preplant incorporation or preemergence herbicide are 0.04 to 0.17 lb of XRM-5019 (0.3 to 0.13 lb ai/A) /acre. Proposed use rates for evaluation as a postemergence herbicide are 0.02 to 0.08 lb. of XRM-5019 per acre in field corn and 0.01 to 0.02 lb of XRM-5019 in soybeans. Control of grasses in the test site will be achieved by evaluating XRM-5019 as a tank-mix with standard preplant incorporation or preemergence herbicides or as a sequential treatment with standard postemergence herbicides. Experimental use of XRM-5019 will involve replicated trials evaluating the formulation alone and in conjunction with standard grass-control herbicides. All treatments will be applied using ground equipment between 1 March 1991 and 1 March 1993. The maximum size of any test location will be two acres with a total of 102 acres to be treated. The total amount of XRM-5019 involved in this EUP will be 20.5 lbs or 15.6 lbs of XRD-498.

11: COMPLETION OF ONE-LINER:

See attached one-liner.

12: CBI APPENDIX:

N/A

Environmental Fate & Ground Water Branch
PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY
XRD 498
Last Update on February 23, 1990
[V] = Validated Study [S] = Supplemental Study

Common Name:XRD 498
Smiles Code:
PC Code # : CAS #:98967-40-9 Caswell #:

Chem. Name :N-(2,6-difluorophenyl)-5-methyl-1,2,4-triazolo[1,5a] pyrimidine-2-sulfonamide
Action Type:Herbicide

Trade Names:
(Formul'tn):75% active ingredient
Physical State:

Use :to control broadleaf weeds in soybeans and field corn
Patterns :
(% Usage) :
:

Empirical Form: $C_{12}H_9F_2N_5O_2S$
Molecular Wgt.: 325.30 Vapor Pressure: 15.00E Torr
Melting Point : °C Boiling Point: °C
Log Kow : Kow = 1.62 pKa: @ °C
Henry's : E Atm. M3/Mol (Measured) 1.14E -3 (calc'd)

Solubility in ...					Comments
Water	5.65E	3	ppm	@25.0 °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:Stable
[V] pH 7.0:Stable
[V] pH 9.0:Stable
[ ] pH :
[ ] pH :
[ ] pH :

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Photolysis (161-2, -3, -4)
[ ] Air :
[ ] Soil :
[ ] Water:
[ ] :
[ ] :
[ ] :

Aerobic Soil Metabolism (162-1)
[V] T1/2 23 days in sandy loam
[V] T1/2 60 days in clay
[V] T1/2 93 days in silt loam
[V] T1/2 102 days in loam
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Anaerobic Soil Metabolism (162-2)
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Anaerobic Aquatic Metabolism (162-3)
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Aerobic Aquatic Metabolism (162-4)
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Soil Partition Coefficient (Kd) (163-1)
[V] 0.05 to 2.42 from sandy loam to clay soils
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Soil Rf Factors (163-1)
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Laboratory Volatility (163-2)
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Field Volatility (163-3)
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Terrestrial Field Dissipation (164-1)
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Aquatic Dissipation (164-2)
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Forestry Dissipation (164-3)
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Long-Term Soil Dissipation (164-5)
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Accumulation in Rotational Crops, Confined (165-1)
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Accumulation in Rotational Crops, Field (165-2)
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Accumulation in Irrigated Crops (165-3)
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Bioaccumulation in Fish (165-4)
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Bioaccumulation in Non-Target Organisms (165-5)
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Ground Water Monitoring, Prospective (166-1)
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Ground Water Monitoring, Small Scale Retrospective (166-2)
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Ground Water Monitoring, Large Scale Retrospective (166-3)
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Ground Water Monitoring, Miscellaneous Data (158.75)
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Field Runoff (167-1)
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Surface Water Monitoring (167-2)
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Spray Drift, Droplet Spectrum (201-1)
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Spray Drift, Field Evaluation (202-1)
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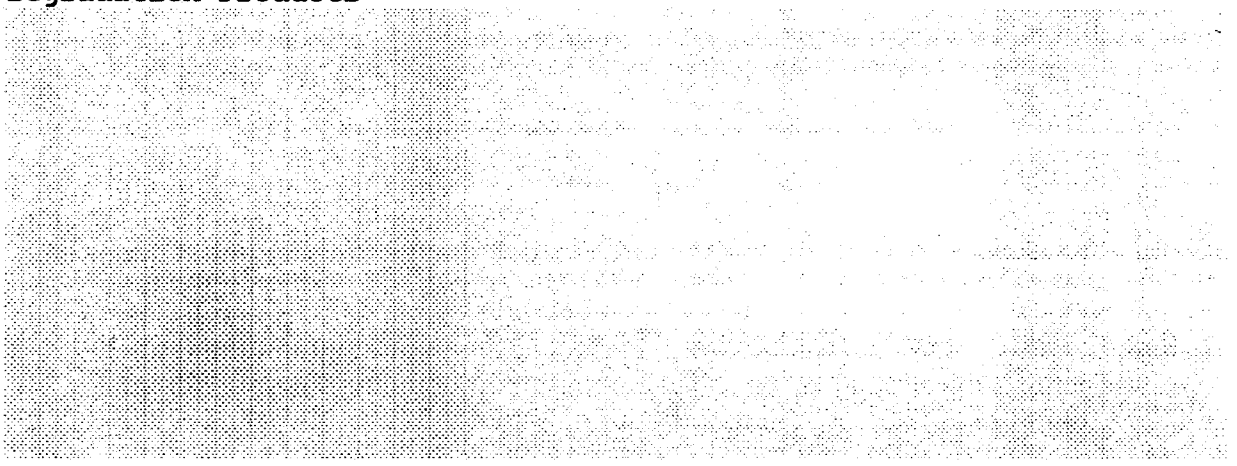
Degradation Products



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Comments

To be updated on 1 February 1990

References: EPA reviews of studies
Writer : J. Hannan