EEB COPY
129016

D167~~EEE~~458
DP BARCODE (RECORD)
129016
SHAUGHNESSEY NO

REVIEW NO.

EEB REVIEW

DATE IN: 8-13-91 OUT: _____

CASE # : 030610
SUBMISSION # : S400745
ID # : 62719-EUP-RA

OCT 22 1991

DATE OF SUBMISSION 6-19-91

DATE RECEIVED BY EFED 8-13-91

SRRD/RD REQUESTED COMPLETION DATE 10-17-91

EEB ESTIMATED COMPLETION DATE 10-17-91

SRRD/RD **ACTION** CODE/TYPE OF REVIEW 710 EUP-NC-F/F USE

MRID #(S) 419317-41, 42, 43

DP TYPE 001 SUBMISSION RELATED DATA PACKAGE

PRODUCT MANAGER, NO. JOANNE MILLER 23

PRODUCT NAME(S) XRM 5019 HERBICIDE

TYPE PRODUCT HERBICIDE

COMPANY NAME DOWELANCO

SUBMISSION PURPOSE REVIEW STUDIES AND PROPOSED EUP FOR USE ON CORN AND SOYBEANS

COMMON CHEMICAL NAME _____

EEB COPY
129016

D167222 458
DP BARCODE (RECORD)
129016
SHAUGHNESSEY NO

REVIEW NO.

EEB REVIEW

DATE IN: 8-13-91 OUT: _____

CASE # : 030610
SUBMISSION # : S400745
ID # : 62719-EUP-RA

DATE OF SUBMISSION 6-19-91

DATE RECEIVED BY EFED 8-13-91

SRRD/RD REQUESTED COMPLETION DATE 10-17-91

EEB ESTIMATED COMPLETION DATE 10-17-91

SRRD/RD **ACTION** CODE/TYPE OF REVIEW 710 EUP-NC-F/F USE

MRID #(S) 419317-41, 42, 43

DP TYPE 001 SUBMISSION RELATED DATA PACKAGE

PRODUCT MANAGER, NO. JOANNE MILLER 25

PRODUCT NAME(S) XRM 5019 HERBICIDE

TYPE PRODUCT HERBICIDE

COMPANY NAME DOWELANCO

SUBMISSION PURPOSE REVIEW STUDIES AND PROPOSED EUP FOR USE ON CORN AND SOYBEANS

COMMON CHEMICAL NAME

EEB REVIEW

Chemical: XRM-5019 (XRD-498) (Proposed Name - flumetsulam)

100 Submission Purpose and Label Information

100.1 Submission Purpose and Pesticide Use

DowElanco is requesting the approval of a two year Experimental Use Permit for the use of XRM-5019 herbicide for broadleaf weed control in field corn and soybeans. XRD-5019 is a sulfonylurea herbicide. The registrant proposes to treat 730 soybean acres in 1992 and 1035 soybean acres in 1993 in 32 states. The registrant also proposed to treat 965 acres of field corn in 1992 and 1165 acres of field corn in 1993 (same states as soybean acres).

100.2 Formulation Information

ACTIVE INGREDIENTS:	
N-(2,6-difluorophenyl)-5-methyl-1,2,4-triazolo-[1,5a]-primidine-2-sulfonamide (XRD-498).....	74.9%
INERT INGREDIENTS:.....	25.1%
TOTAL:	100.00%

This product is a water dispersible granule containing 75% ai DE-498 (flumetsulam). XRM-5019 herbicide contains 0.7490 pounds of active ingredient per pound of product.

100.3 Application Methods, Directions, and Rates

Application is by ground equipment only; 10 to 40 gallons water per acre; 20 to 40# pressure/sq. inch. XRM-5019 will be applied pre-plant incorporated, preemergence to the soil surface with no incorporation, and as a postemergence foliar spray to corn and soybeans. PPI applications are incorporated in the top 2 to 3 inches of soil 0 to 30 days before planting. Pre-emergence application to the soil surface (no soil incorporation) is recommended before, during, or after planting. The before planting soil surface treatment can occur 0 to 30 days before planting. XRM-5019 can also be applied to reduced tillage or no-till fields before, during, or after planting prior to crop emergence.

Application rates for field corn and soybeans are the same for these application methods: preplant incorporated, preemergence soil surface application, no-till, and reduced tillage. The soil applied rates range from 0.0300 to 0.0675 pounds ai/ Acre. The postemergence foliar treatment is applied after the weeds are in the 2 to 4 true leaf stage. For corn, application can be made up

until the corn plants are 12 inches tall. Applications are made to soybeans from the first to the fifth trifoliate leaf stage of growth.

Postemergence application rates range from 0.0150 to 0.0600 pounds ai/Acre for field corn and from 0.0075 to 0.0150 pounds ai/Acre for soybeans. All postemergence applications must include a non-ionic surfactant at 0.25% v/v (1qt/100gal.) or a crop oil at 1% v/v (1gal/100gal.). The label states that the use of crop oil concentrate may increase phytotoxicity to soybeans. Cultivation before, during or within 7 days after, at, or following application may result in reduced weed control. Transient leaf yellowing and/or growth retardation (stunt) of soybeans may occur following XRM-5019 application. These effects will be evident 5 to 7 days after application to soybeans under stress. Under favorable growing conditions the crop will quickly recover.

Crop rotational intervals are quite long indicating long soil half-life and high phytotoxicity at very low rates per acre. The crop rotational intervals are 4 months for alfalfa, dry beans, peas, peanuts, and wheat; 6 months for rice; 18 months for grain sorghum and sunflower; 20 months for cotton; and 22 months for sugarbeets and rapeseed (canola). These intervals are based on the maximum label rate of 0.0675# ai/acre/year.

100.4 Target Organisms

Annual broadleaf weeds. Weed spectrum is similar to atrazine.

100.5 Precautionary Labeling

Do not apply aerially, do not apply through any type of irrigation equipment (chemigation), do not apply where pH is greater than 7.8, do not apply when the soil pH is less than 5.9 and the organic matter content is greater than 5%, do not allow sprays containing XRM-5019 to come in contact with crops or vegetation other than soybeans or corn, avoid application when winds are greater than 10 MPH or under conditions of temperature inversion. Do not use XRM-5019 on field corn grown for seed. Do not exceed 0.0900# XRM-5019 per acre per year (0.0675# ai/Acre/year).

100.6 Proposed EUP Program

100.6.1 Objectives

To assess the product performance of XRM-5019 for broadleaf weed control in corn and soybean production systems.

100.6.2 Date and Duration

Two year EUP is requested for 1992 and 1993 corn and soybean growing seasons.

100.6.3 Amount Shipped/ Geographical Distribution

Approximately 352# of XRM-5019 75% water dispersible granule (264# active ingredient) are requested for use on corn and soybeans in 1992. Approximately 198.9# of XRM-5019 75% water dispersible granule (149.1# active ingredient) are requested for use on corn and soybeans in 1993. Tests will be conducted in the following states: AL, AR, CA, CO, DE, FL, GA, IL, IN, IA, KS, KY, LA, MD, MI, MN, MS, MO, NE, NJ, NY, NC, ND, OH, OK, PA, SC, TN, TX, VA, and WI.

101 Hazard Assessment

101.1 Discussion

The EUP label allows one soil application, one postemergence application, or both as long as 0.0675# ai per acre per year is not exceeded. The following maximum rates and combinations of rates are given:

CORN

Soil applied maximum	= 0.0675# ai/Acre/year
Postemergence maximum	= 0.0600# ai/Acre/year
Maximum soil applied rate in combination with postemergence treatment	= 0.0525# ai (soil) + 0.0150# ai (post)
Maximum postemergence applied rate in combination with soil applied treatment	= 0.0400# ai (post) + 0.0275# ai (soil)

SOYBEANS

Soil applied maximum	= 0.0675# ai/Acre/year
Postemergence maximum	= 0.0150# ai/Acre/year
Maximum soil applied rate in combination with postemergence treatment	= 0.0600# ai (soil) + 0.0075# ai (post)

Maximum postemergence applied rate in combination with soil applied treatment = 0.0150# ai (post) + 0.0525# ai (soil)

101.2 Likelihood of Adverse Effects on Nontarget Organisms

Three studies were submitted with this EUP request:

1) MRID NO. 419317-41; XRD-498 Herbicide: A One-generation Reproduction Study With The Bobwhite (Colinus virginianus).

2.) MRID NO. 419317-42; XRD-498 Herbicide: A One-generation Reproduction Study With The Mallard (Anas platyrhynchos).

3.) MRID NO. 419317-43; XRD-498 Herbicide: The Toxicity Of XRD-498 To (Selenastrum capricornutum).

These studies are under review. The results of these studies will not be available for use in this EUP risk assessment.

Results of previously reviewed studies are:

AVIAN

Species	Test type*	Results
Bobwhite quail	Dietary LC50	>5620 ppm **
Mallard duck	Dietary LC50	>5620 ppm **
Bobwhite quail	Acute oral LD50	>2250 mg ai/Kg**

FISH

Species	Test type*	Results
Atl. silversides	96 hr. LC50	>380 mg/L**
Flathead minnow	96 hr. LC50	>300 mg/L**
Bluegill	96 hr. LC50	>300 mg/L**
Rainbow trout	96 hr. LC50	>300 mg/L**

AQUATIC/ESTUARINE INVERTEBRATES

Species	Test type*	Results
Daphnia magna	48 hr. LC50	243 mg/L**
Grass shrimp	96 hr. LC50	>350 mg/L**
Eastern oyster	96 hr. EC50	>100 mg/L**

* All tests were with 99.6% technical XRD-498.
** Classified as "Practically non-toxic".

INSECT

Species	Test type*	Results
Honey-bee	Acute Contact LD50	>100 ug/bee*** NOEL:36 ug/bee

* All tests were with 99.6% technical XRD-498.
*** Classified as "Relatively non-toxic".

MAMMALS

Species	Test type	Results
Rat	Acute oral*	>5000 mg/Kg (M+F)
Rat	Sub-chronic (13wk) oral	1000 mg/Kg/day (F) 250 mg/Kg/day (M)
Rat	Teratology	1000 mg/Kg/day (NOEL)
Rat	Mutagenicity	Ames - Neg. DNA Assay - Neg. Mutation Assay - Neg. Bone Marrow - Neg.
Rat	Acute oral**	>5000 mg/Kg (M+F)

* Technical form - 99.6% active ingredient.
** Formulation, 74.9% active ingredient.

PLANTS

No studies are available.

ENVIRONMENTAL FATE INFORMATION

The vapor pressure of XRD-498 is 0.8 x ten to minus 15 mmHg at 20 degrees C. (very low). The water solubility is 49 ppm (pH 2.5, 25 degrees C) and 5,650 ppm (pH 7.0, 25 degrees C). The octanol/water, Kow= 1.62. XRD-498 is stable to hydrolysis at pH 5,7,9 at 25 degrees C in the dark with no loss of parent compound after 66 days of incubation. The soil half-life varies from 23 days at low pH to 4 months at high pH. The high pH half-life is reduced to 2 to 4 weeks if the organic carbon content of the soil is under 2.5%. XRD-498 persistence in the field should be shorter for soils with higher pH, but longer for soils with higher organic carbon content. XRD-498 is more water soluble at higher pH but of shorter persistence; unless the soil contains greater than 2.5% organic carbon. *

* EFGWB/EFED/OPP environmental fate data base for XRD-5611 herbicide.

TERRESTRIAL EXPOSURE

The proposed maximum rate for postemergence application to foliage is 0.0600# ai/Acre/year for corn, and 0.0150# ai/Acre/year for soybeans. From the Kenaga chart of maximum expected terrestrial pesticide residues on vegetation, the proposed two year use of XRD-5019 is not expected to acutely affect non-endangered avian or mammalian species.

short rangegrass	14.4 ppm
tall rangegrass	6.6 ppm
leaves and leafy crops	7.5 ppm
forage, alfalfa, clover	3.5 ppm
pod containing legumes	0.7 ppm
fruit, cherries/peaches	0.4 ppm

AQUATIC EXPOSURE

Due to high water solubility at high pH levels, a 5% runoff expectation is used in the calculations. If 10 treated acres drain into a 1 acre pond, the following aquatic exposure levels are calculated:

0.0675# ai/A (1 Pre soil surface)
x 10 acres

0.675# ai applied
x 0.05 5% runoff

0.0338# ai into a pond

EEC
6 foot deep pond = 2.1 ppb
6 inch deep pond = 24.8 ppb

These expected exposure levels are well below the acute LC50 levels for fish, Daphnia magna and grass shrimp; and well below the EC50 level for Eastern oyster:

ONE-TENTH THE LC/EC50 VALUES	
Atlantic silversides	38 ppm
Flathead minnow	30 ppm
Bluegill	30 ppm
Rainbow trout	30 ppm
Daphnia magna	24 ppm
Grass shrimp	35 ppm
Eastern oyster	10 ppm

Based on these one-tenth LC/EC50 values, this two year EUP

request is not expected to cause acute adverse effects to non-target aquatic or estuarine animal species.

Based on honey-bee acute toxicity data, this two year EUP request is not expected to adversely affect non-target beneficial insect species.

101.3 Endangered Species Considerations

TERRESTRIAL

The proposed two year EUP is not expected to be acutely toxic to mammalian or avian endangered species.

ONE-TENTH THE LD/LC50 VALUES	
avian species tested	562 ppm (dietary)
	225 mg/Kg (acute oral)
rat	500 mg/Kg (acute oral)

AQUATIC

This proposed two year EUP is not expected to be acutely toxic to endangered aquatic or estuarine species.

ONE-TWENTIETH THE LC/EC50 VALUES	
Atlantic silversides	19 ppm
Flathead minnow	15 ppm
Bluegill	15 ppm
Rainbow trout	15 ppm
Daphnia magna	12 ppm
Grass shrimp	18 ppm
Eastern oyster	05 ppm

INSECT

Based on the honey-bee acute study, this two year EUP request is not expected to be acutely toxic to endangered insect species. This herbicide will primarily be applied in the spring before most crops have emerged.

PLANTS

No non-target plant studies are available for review. Because XRM-5019 will be applied exclusively by ground equipment, and because so few acres will be treated, we expect minimal off-target movement to non-target and endangered plant species during application. Because this herbicide is a sulfonylurea, and because the potential market is so large (>50,000,000 acres), the registrant must submit Tier II Non-target plant phytotoxicity data

prior to Section 3 registration. These tests include 123-1 (seed germination, seedling emergence, and vegetative vigor) and 123-2 (aquatic plant growth using Lemna gibba, Skeletonema costatum, Anabaena flos-aquae, and a freshwater diatom. The 5th required Tier II aquatic plant growth study, Selenastrum capricornutum was submitted with this EUP request and is under review.

101.4 Adequacy Of Toxicity Data

Previously submitted data were found adequate for an assessment of the acute toxicity of XRM-5019 to terrestrial and aquatic animal species. Two avian reproduction studies and one aquatic plant growth study were submitted with this EUP request (see 101.2 above), and are under review.

101.5 Adequacy of Labeling

The proposed EUP label appears adequate.

102.0 Classification

Not currently classified.

103 Conclusions

The EEB has completed a review of the proposed EUP program and label for 1992 and 1993. Based on the available information, XRM-5019 is not expected to adversely affect non-target or endangered animals species. Based on the proposed use patterns and rates, adverse chronic effects are not expected. However, the long soil half-life is an avian concern. The registrant has submitted avian reproduction studies with this EUP request and they are under review. Chronic aquatic toxicity tests will be reserved pending the availability of a more complete environmental fate data base (ie. half-life in water, soils), and the Section 3 use sites and rates.

Any movement of XRM-5019 off-target is expected to adversely affect plants contacted by spray. The EUP label states "Do not allow sprays containing XRM-5019 Herbicide to come in contact with crops or vegetation other than soybeans or corn". Based on the long half-life of XRM-5019 in soil, the potential for adverse off-target effects on plants via wind-blown soil particles may exist. Based on the limited number of acres to be treated and the ground application equipment only restriction, off-target drift during application is expected to be minimal.

Prior to Section 3 registration the registrant must provide the following:

1.) 123-1 Tier II Seed Germination/Seedling Emergence

2.) 123-1 Tier II Vegetative Vigor

3.) 123-2 Tier II Aquatic Plant Growth for
Lemna gibba (duckweed)
Skeletonema costatum (marine diatom)
Anabaena flos-aquae (blue-green alga)
Unspecified species (freshwater diatom),

Based on the crop rotation restrictions on the proposed label, the registrant must include sugarbeets and rapeseed (canola) as two of the ten test species in the 123-1 Tier II tests.

Richard C. Petrie 10/03/91
Richard C. Petrie, Agronomist
Ecological Effects Branch
Environmental Fate And Effects Division (H7507-C)

Daniel Rieder 10.17.91
Daniel Rieder, Section Head, Section III
Ecological Effects Branch
Environmental Fate And Effects Division (H7507-C)

Douglas J. Urban 10/17/91
Douglas J. Urban, Acting Chief
Ecological Effects Branch
Environmental Fate And Effects Division (H7507-C)

RIN 1948-94

FLUMETSULAM REVIEWS (129016)

Page_____ is not included in this copy.

Pages 12 through 18 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.

STUDY TITLE

Section G: Proposed Experimental Program - XRM-5019 Herbicide (DE-498)

flumetsulam

DATA REQUIREMENTS

Section G: E.U.P. Program

AUTHORS

C. M. Carson
D. H. Lade, Ph.D

SUBMITTED ON

June 17, 1991

COMPANY

DowElanco
9002 Purdue Road
Indianapolis, Indiana 46268-1189

EPA COMPANY ID. NO.

62719

RIN 1948-94

FLUMETSULAM REVIEWS (129016)

Page_____ is not included in this copy.

Pages 20 through 30 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.

DP BARCODE: D167458

CASE: 030610 DATA PACKAGE RECORD DATE: 08/12/91
SUBMISSION: S400745 BEAN SHEET Page 1 of 1

* * * CASE/SUBMISSION INFORMATION * * *

CASE TYPE: EUP (SECT 5) ACTION: 710 EUP-NC-F/F USE
CHEMICALS: 129016 xrm 5019 herbicide 74.0000%

ID#: 062719-EUP-RA
COMPANY: DOWELANCO
PRODUCT MANAGER: 23 JOANNE MILLER 703-557-1830 ROOM: CM2 237
PM TEAM REVIEWER: STEVEN ROBBINS 703-557-8611 ROOM: CM2 255
RECEIVED DATE: 06/19/91 DUE OUT DATE: 10/17/91

* * * DATA PACKAGE INFORMATION * * *

DP BARCODE: 167458 EXPEDITE: N DATE SENT: 08/12/91 DATE RET.: / /
CHEMICAL: 129016 xrm 5019 herbicide
DP TYPE: 001 Submission Related Data Package
ADMIN DUE DATE: 10/31/91 CSF: N LABEL: Y

ASSIGNED TO	DATE IN	DATE OUT
DIV : EFED	08/13/91	/ /
BRAN: EEB	8/13/91	10/17/91
SECT:	/ /	/ /
REVR :	/ /	/ /
CONTR:	/ /	/ /

* * * DATA REVIEW INSTRUCTIONS * * *

Please review this data (MRID#s 419317-40 thru 419317-43) and advise as to the acceptability of this EUP, to be used on corn and soybeans. Other Wildlife and Aquatic data (MRID#s 412632-18 thru 412632-27) was submitted for a crop destruct EUP.

* * * ADDITIONAL DATA PACKAGES FOR THIS SUBMISSION * * *

DP BC	BRANCH/SECTION	DATE OUT	DUE BACK	INS	CSF	LABEL
167459	EFGB	08/12/91	10/31/91	Y	N	Y
167460	FHB/PMT-21	08/12/91	10/31/91	Y	N	Y