DP Barcode : D189826
PC Code No : 129016
EEB Out : JUN 21 1993

To: JOANNE MILLER
Product Manager 23
Registration Division (H7505C)

From: Anthony F. Maciorowski, Chief
Ecological Effects Branch/EFED (H7507C)

Attached, please find the EEB review of...

Reg./File # : 62719
Chemical Name : FLUMETSULAM
Type Product :
Product Name :
Company Name : DOWELANCO
Purpose : RESPOND TO REGISTRANT COMMENT AND REBUTTAL OF PREVIOUS EEB REVIEW. NOTE THAT THE REGISTRANTS SUBMISSION CONCERNING EEC WILL BE EVALUATED BY EFGWB
Action Code : 101 Date Due :
Reviewer : MIKE DAVY Date In EEB: 4-6-93

EEB Guideline/MRID Summary Table: The review in this package contains an evaluation of the following:

GDLN NO	MRID NO	CAT	GDLN NO	MRID NO	CAT	GDLN NO	MRID NO	CAT
71-1(A)			72-2(A)			72-7(A)		
71-1(B)			72-2(B)			72-7(B)		
71-2(A)			72-3(A)			122-1(A)		
71-2(B)			72-3(B)			122-1(B)		
71-3			72-3(C)			122-2		
71-4(A)			72-3(D)			123-1(A)	42573901	
71-4(B)			72-3(E)			123-1(B)	42573901	
71-5(A)			72-3(F)			123-2		
71-5(B)			72-4(A)			124-1		
72-1(A)			72-4(B)			124-2		
72-1(B)			72-5			141-1		
72-1(C)			72-6			141-2		
72-1(D)						141-5		

Y=Acceptable (Study satisfied Guideline)/Concur
P=Partial (Study partially fulfilled Guideline but additional information is needed
S=Supplemental (Study provided useful information but Guideline was not satisfied)
N=Unacceptable (Study was rejected)/Nonconcur

DP BARCODE: D189826

CASE: 031451 DATA PACKAGE RECORD DATE: 04/02/93
SUBMISSION: S438177 BEAN SHEET Page 1 of 1

* * * CASE/SUBMISSION INFORMATION * * *

CASE TYPE: REGISTRATION ACTION: 101 RESB NC-FOOD/FEED USE
CHEMICALS: 129016 (1,2,4)-Triazolo(1,5-a)pyrimidine-2-sulfonamide, N 98.0000%

ID#: 062719-EEG dowelanco/de-498 98% technical manuf. use product
COMPANY: 062719 DOWELANCO
PRODUCT MANAGER: 23 JOANNE MILLER 703-305-7830 ROOM: CM2 237
PM TEAM REVIEWER: STEVEN ROBBINS 703-305-7546 ROOM: CM2 263
RECEIVED DATE: 03/30/93 DUE OUT DATE: ~~10/06/93~~

* * * DATA PACKAGE INFORMATION * * *

DP BARCODE: 189826 EXPEDITE: N DATE SENT: 04/02/93 DATE RET.: / /
CHEMICAL: 129016 (1,2,4)-Triazolo(1,5-a)pyrimidine-2-sulfonamide, N-(2,6-dif
DP TYPE: 001 Submission Related Data Package
ADMIN DUE DATE: 07/31/93 CSF: N LABEL: N

ASSIGNED TO	DATE IN	DATE OUT
DIV : EFED	4/6/93	/ /
BRAN: EEB	4/6/93	/ /
SECT:	/ /	/ /
REVR :	/ /	/ /
CONTR:	/ /	/ /

* * * DATA REVIEW INSTRUCTIONS * * *

Enclosed please find DowElanco's response to EEB's review of December 16, 1992. This submission addresses non-target terrestrial plant data, endangered aquatic plant species, concerns about leaching of DE-498, concerns about the EEC, and differentiation between sulfonylureas and triazolopyrimidine sulfonanilides. Please review this response, on the above topics, and advise as any changes in EEB's view of the registration status of this new chemical.

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

DP BC	BRANCH/SECTION	DATE OUT	DUE BACK	INS	CSF	LABEL

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

JUN 21 1993

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Updated Ground Applied EEC, Aerial EEC and Response to DowElanco Rebuttal of Flumetsulam Science Chapter (D189826)

FROM: Anthony F. Maciorowski, Chief
Ecological Effects Branch
Environmental Fate and Effects Division (H7507C)

TO: Joanne Miller, PM-23
Fungicide-Herbicide Branch
Registration Division (H7505C)

The Ecological Effects Branch has reviewed the DowElanco rebuttal for Flumetsulam Science Chapter. In addition, EEB has provided a plant risk assessment with updated EEC for ground applied flumetsulam based on EFGWB models and has provided a plant risk assessment based on calculated ECC for aerial application. This action is under D189826.

1. Registrant has expressed concern that flumetsulam not be compared to sulfonylurea class of herbicides. EEB recognized that flumetsulam is not a sulfonylurea but a sulfonanilide herbicide. The ecological effects assessment will stand solely on the basis of properties and behavior of the flumetsulam molecule.

2. Registrant has provided modeling to show that Flumetsulam may not transport with runoff at the rates EEB previously anticipated. That modeling and information on the fate of the chemical were provided to EFGWB for their evaluation. EFGWB's evaluation will be incorporated into the EEB risk assessment below. Calculations of EEC are attached.

A. Ground applied EEC from models or calculations

PRZM1-EXAMS: Corn/Soybeans on Mississippi Loring Silt Loam

EEC values based on PRZM1-EXAMS model from EFGWB with an annual exceedence probability of 10% over 36 years. Maximum initial 48 hour EEC in 6 ft pond is **14 ppb** (See Fig. A). In 6 inches of water, the EEC = **169 ppb.** EEC of semi-aquatic plants in wetlands would be **0.229508 lb ai/A.**

PRZM1-EXAMS: Corn or Soybeans on Iowa Fayette Silt Loam
EEC values based on PRZM1-EXAMS model from EFGWB with an annual exceedence probability of 10% over 36 years. Maximum initial 48 hour EEC in 6 ft pond is **5.5 ppb** (See Fig. B). In 6 inches of water, the EEC = **66.3 ppb.** EEC of semi-aquatic plants in wetlands would be **0.090164 lb ai/A.**

PRZM: Corn or Soybean on Mississippi Loring Silt Loam
Runoff of flumetsulam from soybean or corn ground application will go onto adjacent acreage. The EEC values are based on PRZM model made by EFGWB over 36 year period with an annual exceedence probability of 10%. The loss of flumetsulam in runoff from a single storm is 3% of the total application at the edge of the field (See Fig. C). The EEC for runoff affecting non-target terrestrial plants is **0.0201 lb ai/A**.

PRZM: Corn or Soybean on Iowa Fayette Silt Loam
Runoff of flumetsulam from soybean or corn ground application will go onto adjacent acreage. The EEC values are based on PRZM model made by EFGWB over 36 year period with an annual exceedence probability of 10%. The loss of flumetsulam in runoff from a single storm is 2.1% of the total application at the edge of the field (See Fig. D). The EEC for runoff affecting non-target terrestrial plants is **0.0141 lb ai/A**.

B. Aerial application EEC calculation:

If aerial application is labeled at 0.67 lb ai/A;

the EEC from drift alone would be **0.0335 lb ai/A**

the aquatic pond EEC from drift and runoff would be:
0.04727 lb ai/A or
10.4 ppb in 6 ft of water or
169 ppb in 6 inches of water

The drift and runoff as a result of aerial application will go onto adjacent acreage to affect non-target terrestrial plants from one acre to one acre. EEC for runoff and drift affecting non-target terrestrial plants near site of application is **0.04556 lb ai/A**

C. Plant toxicity values

Aquatic plant toxicity:
Selenastrum capricornutum EC_{50}=3.31 ppb
Lemna gibba EC_{50}= 3.1 ppb

Terrestrial plant toxicity:
cucumber emergence EC_{25}= 0.00159 lb ai/A (from seedling emergence study) for runoff

From the vegetative vigor study for drift only:
onion EC_{25} =0.0004 lb ai/A for shoot weight
radish EC_{25} =0.0003 lb ai/A for shoot length and shoot weight.

D. Plant Risk Assessment

a. Aerial application

EEC calculations indicate that **non-target aquatic and semi-aquatic plants (including endangered plants) in 6 feet or 6 inches of water (wetlands) are expected to be adversely affected from runoff and drift on soils that range from Iowa Fayette Silt Loam to Mississippi Loring Silt Loam.**

EEC calculations indicate that non-target terrestrial plants (including endangered plants) are expected to be adversely affected from drift by a factor of a hundred and ten.

b. Ground application

EFGWB EEC models indicate that **aquatic and semi-aquatic (wetland) non-target plants (including endangered plants) are expected to be adversely affected from proposed labeled use of flumetsulam on soils that range from Iowa Fayette Silt Loam to Mississippi Loring Silt Loam in a 6 ft or 6 inch deep pond.**

EEC calculations indicate that **non-target terrestrial plants are expected to be adversely affected from runoff from proposed labeled use on adjacent sites.**

c. Irrigation concerns

EFGWB has described flumetsulam in 3/2/93 review as being **persistent** in soil and water with terrestrial field dissipation $t_{1/2}$= 1.5 to 3 months on sandy loam and silt loam soils, aerobic soils metabolism $t_{1/2}$=22 to 130 days, hydrolysis= stable, and anaerobic aquatic metabolism $t_{1/2}$=183 days. In addition, flumetsulam is **mobile** in soils as a leacher. There is concern for surface or groundwater contamination in EFGWB review. EEB has concerns that contaminated surface or groundwater used for irrigation may adversely affect non-target plants. **Data from EFGWB are insufficient** to make a valid assessment at this time on phytotoxicity from irrigation of contaminated water on non-target plants.

3. Registrant has provided much analysis in trying to show that endangered species of plants will not be adversely affected from runoff or drift based on their runoff model. A perception is created that tolerant species in one family should suffice for entire family and that perennial plants will not be affected. This perception does not have a scientific basis supported by valid data. Experience has shown that there are species in one family that more tolerant to the herbicide and another species in the same family are very susceptible to the herbicide. We cannot be certain that the use of the herbicide will not adversely affect endangered species. The only possible family that may have some considerations as to being not as adversely affected as some species in other families would the grass family (Poaceae). Monocots are affected but the grass species that was used in the plant studies was not affected by flumetsulam and the label indicates that grass may be tolerant of flumetsulam. Yet EBB can not say for certain that all the species in this family will not be susceptible to flumetsulam at the labeled rate. **EEB maintains that endangered species of plants may be adversely affected from the proposed use of flumetsulam for soybean and corn.**

Conclusions

EEB has concluded that aquatic, semi-aquatic (wetland), and terrestrial non-target plants (including endangered species) will be adversely affected by aerial applications of flumetsulam. Since the EC_{25} and EC_{50} indicate that flumetsulam is extremely toxic to non-grass plants, **EEB recommends that flumetsulam not be registered for aerial applications** because the distance of drift is expected to be large since only 0.045% of the application rate would adversely affect terrestrial plants.

EEB has concluded that adjacent **non-target aquatic plants will be adversely affected by runoff from ground application of flumetsulam to soybean and corn.** The adverse effects on non-target aquatic plants may also adversely affect other aquatic organisms by food and shelter depletion.

There are insufficient data to conclude adverse effects to non-target terrestrial plants because only two species (cucumber and cabbage) were found to have EC_{25} values from the seedling emergence study. Yet, with the very limited information, it can be seen that flumetsulam **will adversely affect non-target terrestrial plants from runoff. EEB needs data from additional emergence studies as indicated in the previous (6/7/93) review.**

EEB has concluded that endangered species of plants may be adversely affected by the use of flumetsulam under the proposed label.

If you have any questions, please do not hesitate to contact Mike Davy at 305-7081.

EEC Calculations

PRZM1-EXAMS: Corn/Soybeans on Mississippi Loring Silt Loam
14 ppb/61 ppb per 1 lb/A in 6 feet of water= 0.229508 lb ai/A
14 ppb/61 ppb x 735 ppb= 169 ppb in 6 inches of water

PRZM1-EXAMS: Corn or Soybeans on Iowa Fayette Silt Loam
5.5 ppb/61 ppb per 1 lb/A in 6 feet of water= 0.090164 lb ai/A
5.5 ppb/61 ppb x 735 ppb= 66.3 ppb in 6 inches of water

PRZM: Corn or Soybean on Mississippi Loring Silt Loam
0.67 lb ai/A x 3% loss x 1 acre= 0.0201 lb ai/A

PRZM: Corn or Soybean on Iowa Fayette Silt Loam
0.67 lb ai/A x 2.1% loss x 1 acre = 0.0141 lb ai/A

Aerial application EEC calculation:

the EEC from drift alone would be **0.0335 lb ai/A** (5% drift x 0.67 lb ai/A).

the aquatic pond EEC from drift and runoff would be:

[(0.67 lb ai/A x 5% drift) + (0.6 efficiency x PRZM1-EXAMS for Loring soil EEC/61 ppb /10 acre) = 0.04727 lb ai/A (wetlands)

[(0.67 lb ai/A x 5% drift) x 61 ppb] + (0.6 efficiency x PRZM1-EXAMS for Loring soil EEC) =10.4 ppb in 6 ft of water

[(0.67 lb ai/A x 5% drift) x 735 ppb] + (0.6 efficiency x PRZM1-EXAMS for Loring soil EEC/61 ppb x 735 ppb)= 169 ppb in 6 inches of water

Terrestrial EEC drift and runoff for terrestrial plants
(0.67 lb ai/A x 5% drift) + (0.6 efficiency x 3% loss from PRZM [0.0201] x 1 acre)= 0.04556 lb ai/A.

FIG. A

Flumetsulam Pond EEC (PRZM1 – EXAMS)
Corn & Soybeans on Loring Silt Loam – MS

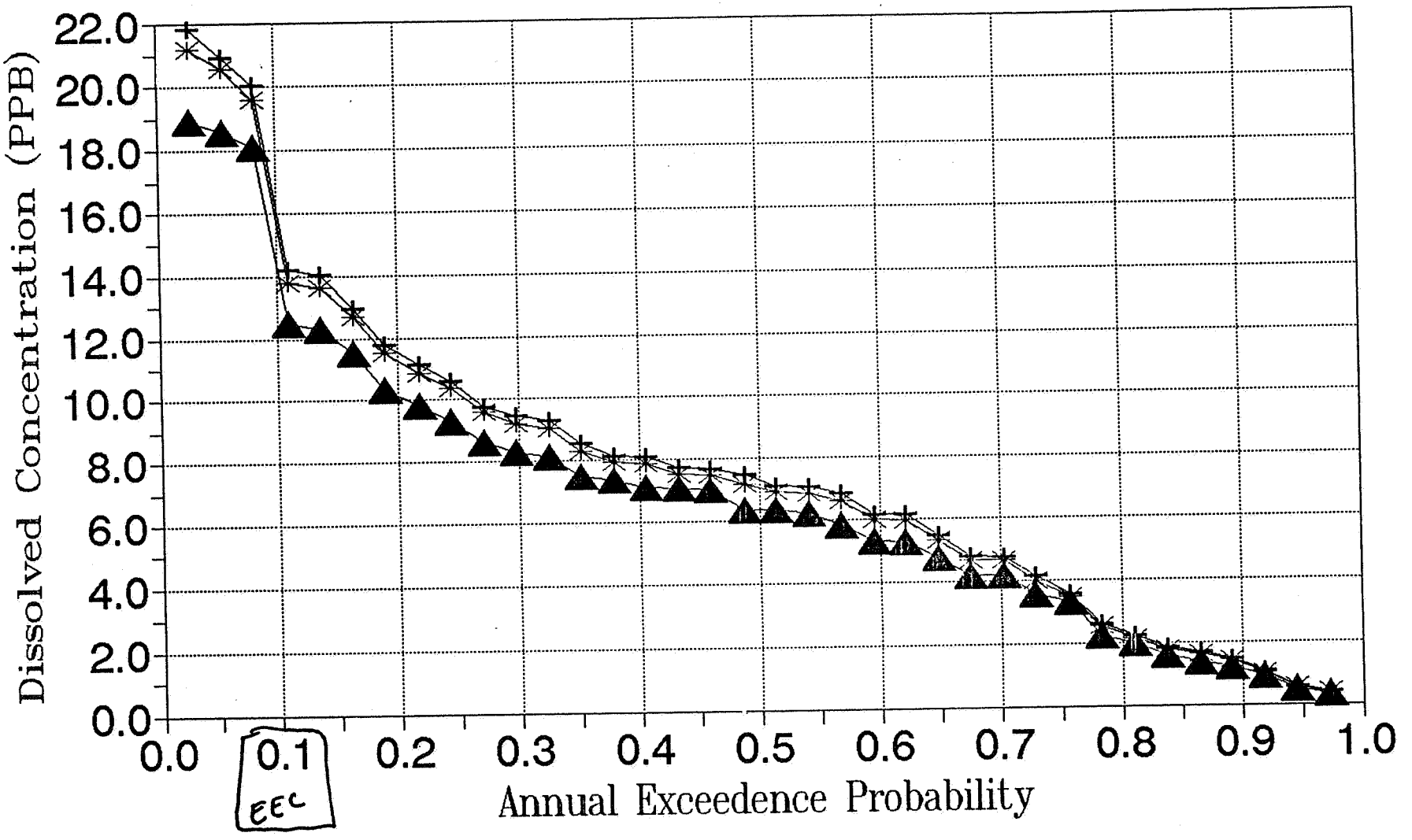
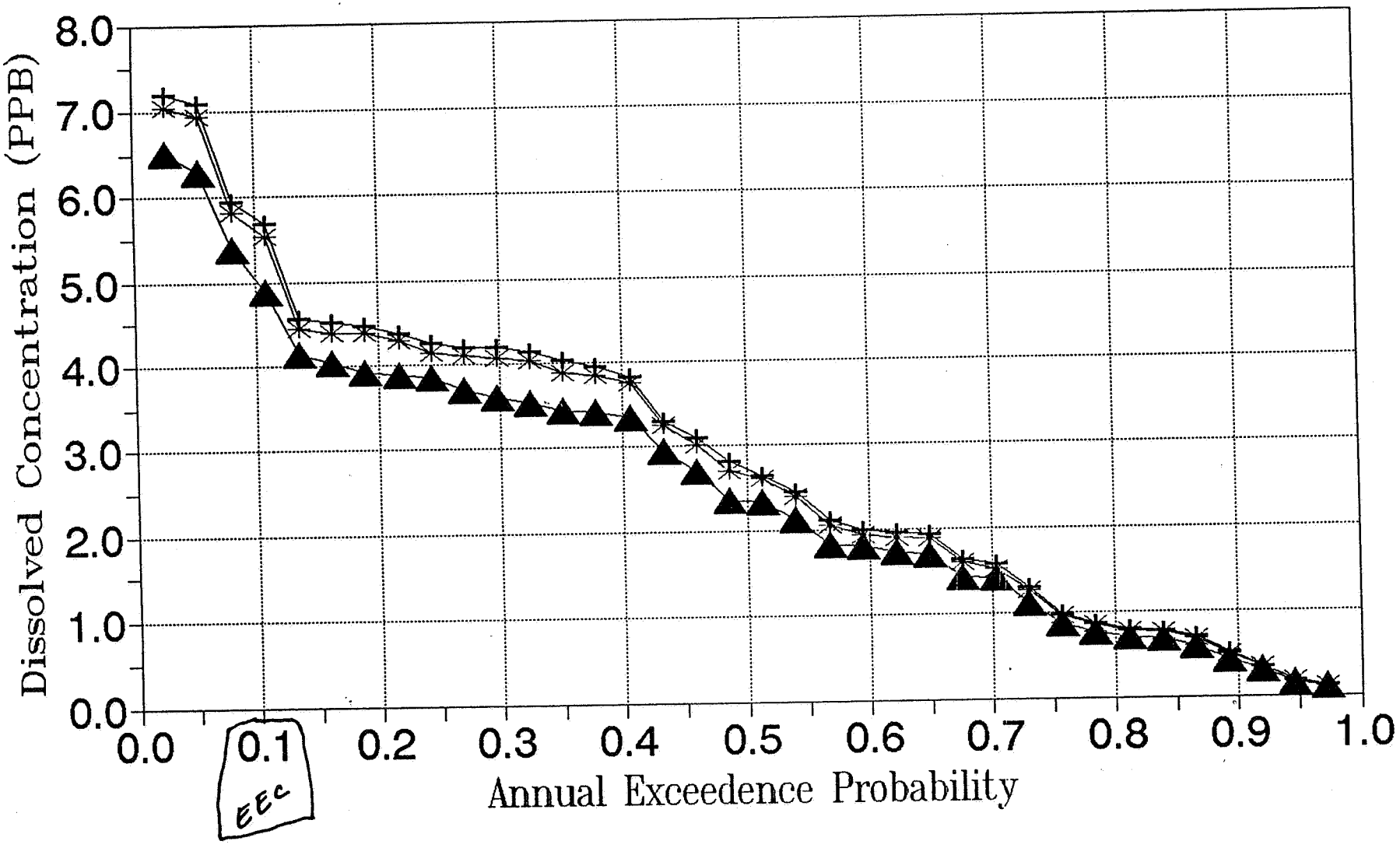


FIG. A

FIG. B

B

Flumetsulam Pond EEC (PRZM1 – EXAMS)
Soybean & Corn on Fayette Silt Loam – Iowa



PREM

FIG. C

Flumetsulam Loss (Dissolved & Adsorbed)

Corn & Soybeans on Loring Silt Loam MS

EDGE OF FIELD

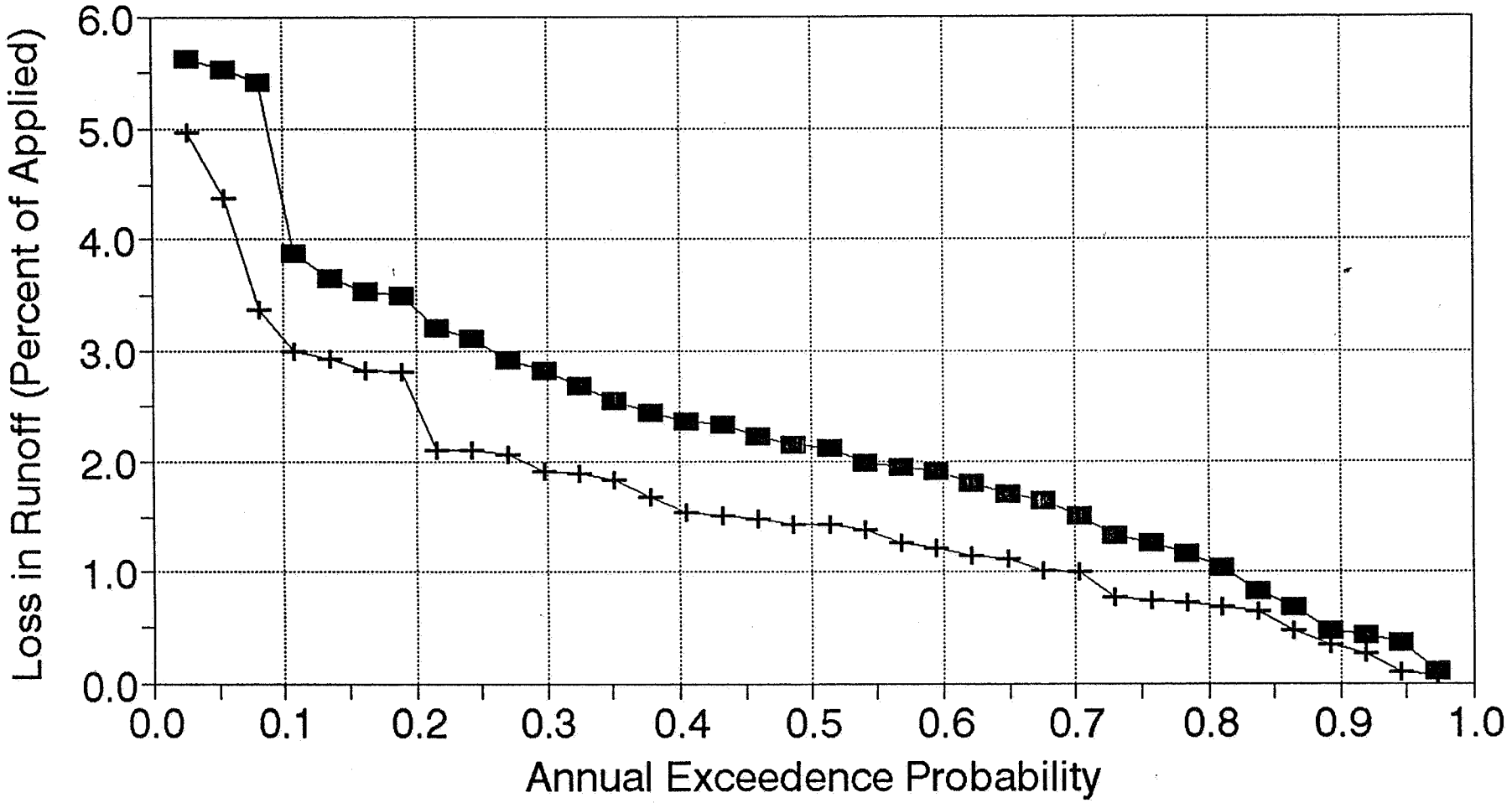


FIG. 4

Flumetsulam Loss (Dissolved & Adsorbed)

Soybean & Corn on Fayette Silt Loam

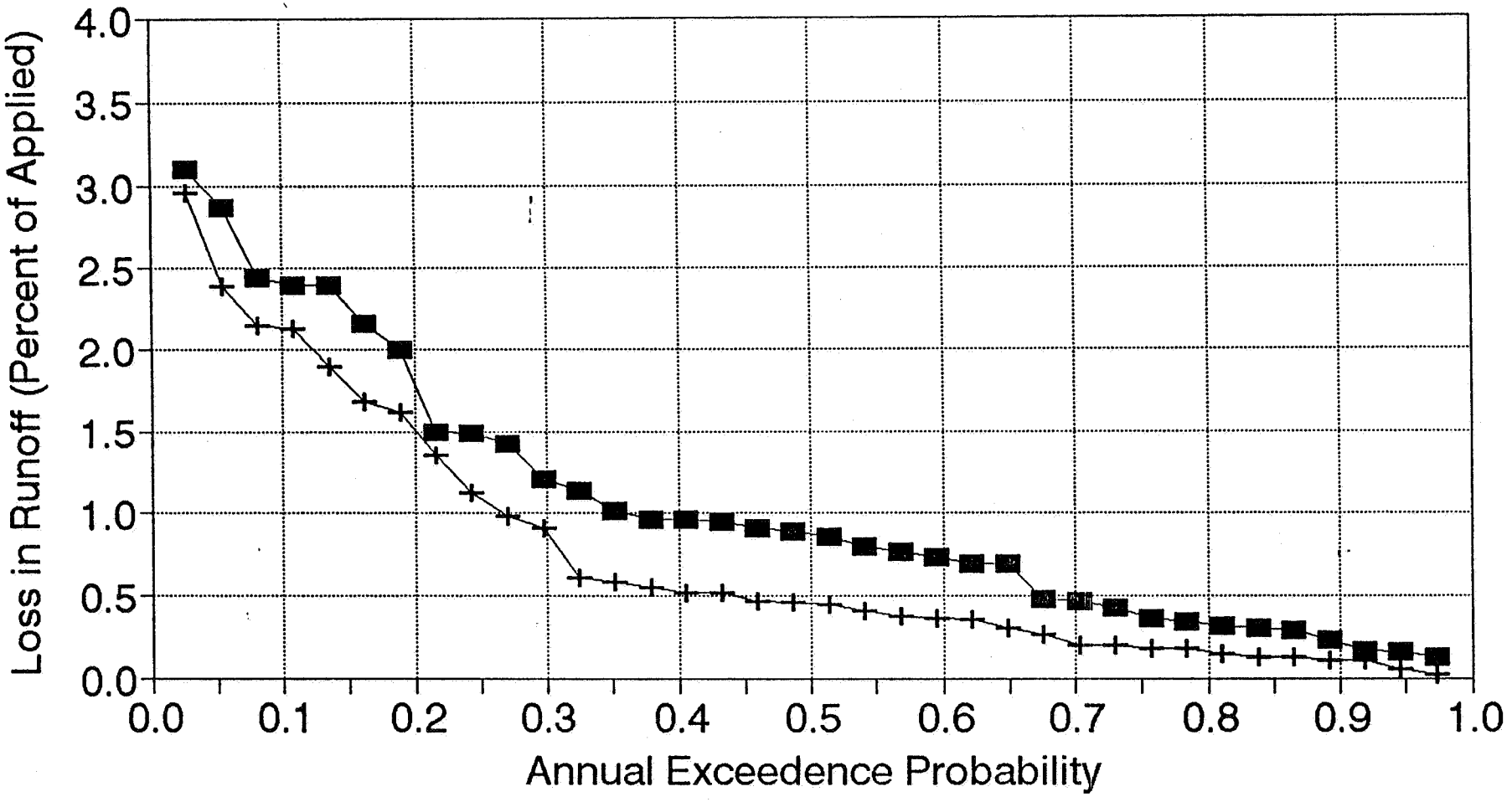
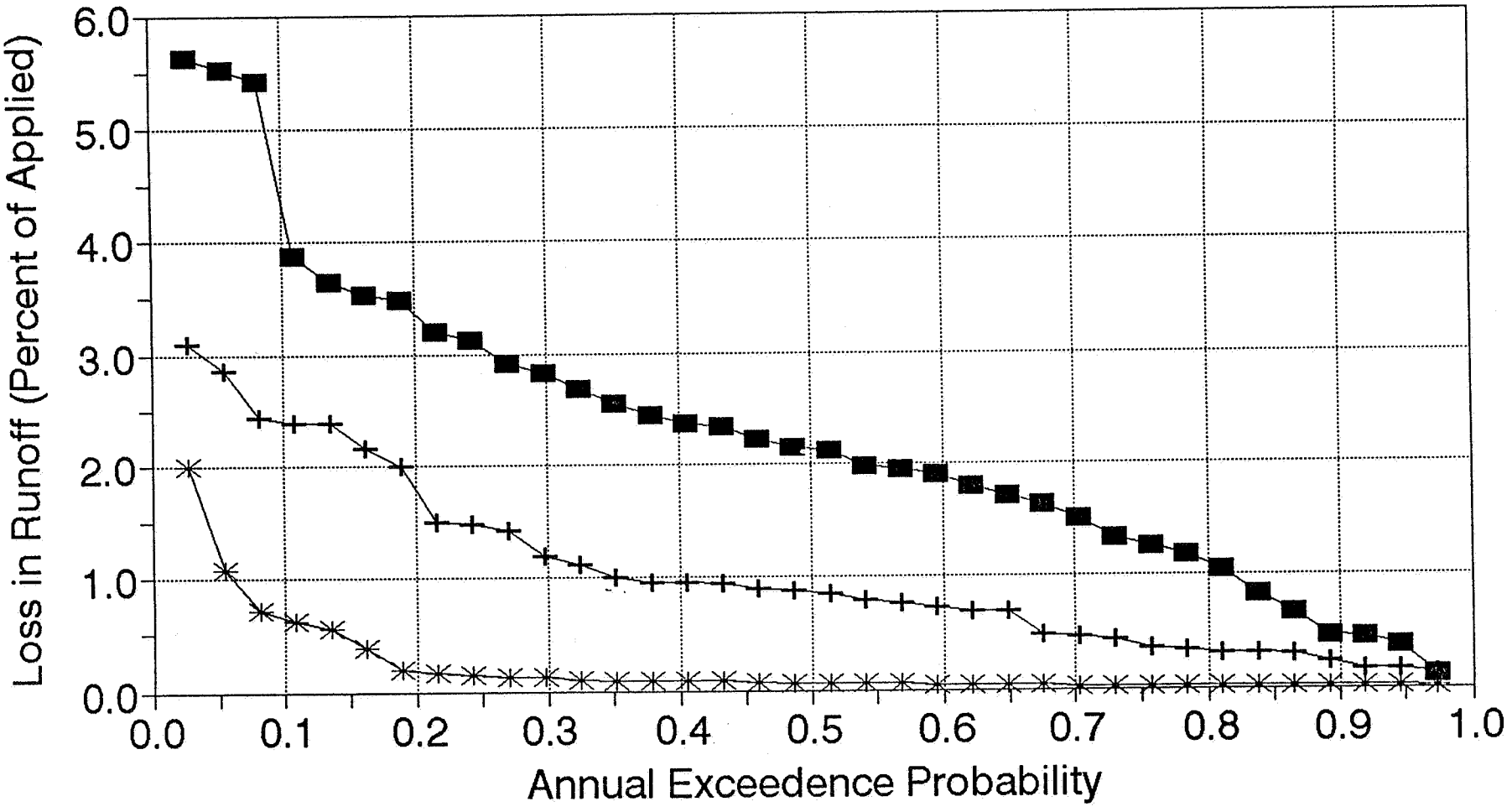


FIG. 4

Flumetsulam Loss (Dissolved & Adsorbed)

Loring Siltloam MS-Fayette Siltloam IA

TOTAL YEAR Amount of Loss



Flumetsulam Pond EEC (GLEAMS - EXAMS)
Corn on Fayette Silt Loam - IA