

US EPA ARCHIVE DOCUMENT

06 FEB 1984

MEMORANDUM OF MEETING

PM #25-R. Taylor  
EAB-S. Creeger, R. Moraski and C. Fletcher  
FMC Corp.-R. Cook and J. Lauber

On January 24, 1984, we met with representatives of FMC Corp. to discuss data needed to support use of FMC 57020 (herbicide) on soybeans under an EUP and registration.

EUP

Hydrolysis  
Aqueous photolysis  
Aerobic soil metabolism  
Leaching  
Rotational crop data or temp. tolerance, etc.

Registration

Hydrolysis  
Aqueous photolysis  
Soil photolysis  
Aerobic soil metabolism  
Anaerobic soil metabolism  
Leaching  
Aged leaching  
Field dissipation  
Rotational crop data (confined and field)  
Fish accumulation

Comments

Photolysis data are requested under the EUP due to the large (70,000 acres) amount of acreage and poundage (70,000 lb ai) involved. Soil photolysis data are preferred but sensitized aqueous photolysis data will suffice for the EUP.

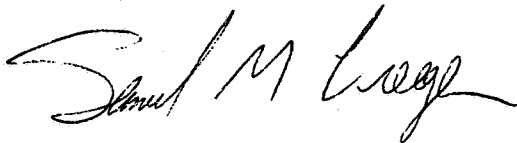
If the registrant can show that only parent compound is present after 30 days of aerobic aging, then the aged leaching study could be waived.

Current field dissipation data do not conclusively show the absence of leaching of residues beyond 12 inches. The study will have to be repeated or the registrant will have to address the issue by some or all of the following:

- Analyze the frozen 7-day samples for residues including the product found in the anaerobic study

- Conduct a short (@ 60 days) field study with artificial rainfall if necessary, to determine if a slug of chemical moves through the soil profile. These studies should be run on the plots on which the previous field studies were run, plus another study on a sandy soil should be run. Results of the data may result in the necessity for additional data.

- Protocols for conducting additional studies should be submitted for EAB review. The protocols should include provisions for: sandy soil, rainfall or irrigation immediately after application and during the first 2-weeks post-application to simulate a worst-case situation (check rainfall charts for this), soil sampling to sufficient depth to define extent of leaching, analysis for parent and metabolite A, soil incorporation of the active ingredient per label instructions.



Samuel M. Creeger  
February 6, 1984  
EAB/HED

FMC Corporation

Agricultural Chemical Group  
2000 Market Street  
Philadelphia Pennsylvania 19103  
(215) 299 6000

55, '1800

December 20, 1983

**FMC**

Jan 24  
10 am

Mr. Robert J. Taylor (PM-25)  
Registration Division (TS-767C)  
Office of Pesticide Programs  
Environmental Protection Agency  
Room 245, Crystal Mall 2  
1921 Jefferson Davis Highway  
Arlington, VA 22202

Dear Mr. Taylor:

Subject: FMC 57020 Herbicide  
(Experimental Use Permit No. 279-EUP-93)

On June 27, Mr. Ronald F. Cook, Dr. R. A. Robinson and I met with Ms. Janet Remmers, RD, Dr. Richard V. Moraski and Mr. Clinton Fletcher, EAB, HED, to discuss FMC's progress and plans for FMC 57020 herbicide. Highlights of this meeting were:

Dr. Moraski and Mr. Fletcher agreed that there would be nothing to learn from conducting a field dissipation study with monitoring for leaching and potential ground water contamination of FMC 57020. This is because FMC 57020 will move downward in the soil profile and has the potential to end up in the ground water. Consequently, there is no need to generate data to confirm this acknowledged potential.

In place of the monitoring study, Dr. Moraski and Mr. Fletcher indicated that computer modeling would provide adequate rate of movement information for the full registration of FMC 57020 as long as nothing unusual developed in the soil dissipation study.

We wish to review with Dr. Moraski and Mr. Fletcher recently developed information concerning FMC 57020 herbicide and obtain their comments and suggestions. Specifically, we wish to discuss:

1. Soil dissipation study (four locations)
2. Computer modeling to predict movement of FMC 57020 in soil.

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Mr. Robert J. Taylor  
Page 2

I'd appreciate it if you would set up a meeting for us with Dr. Moraski and Mr. Fletcher. Mr. Ronald F. Cook, Residue Analysis Manager of our Research and Development Department will accompany me. Agreeable dates for us are 1/24, 1/25 or 1/26 at 10:00 am or 1 pm. Please let me know which date and time would be most convenient for you. You can reach me at 215-299-6503.

Thank you in advance for your assistance in setting up this meeting.

Sincerely yours,



J. J. Lauber  
Manager  
Product Registration

cc: D. B. Carlson  
R. F. Cook  
J. R. Graham  
J. F. McCarthy

r48B4  
dd24

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125401

FILE

June 28, 1983

REPORT OF MEETING, JUNE 27, 1983.

SUBJECT: FMC 57020 4 EC Herbicide, EUP Permit No. 279-EUP-93

Participants:	C. Fletcher, EAB, HED	R. Cook, FMC
	R. Moraski, "	R. Robinson, "
	J. Remmers, HRB, RD	J. Lauber, "

EAB met with FMC representatives to discuss EAB review of FMC 57020, dated 12/3/82.

FMC wanted further clarification of the following EAB comments:

1. EAB's recommendation that the FMC field dissipation study include monitoring for leaching and contamination of ground water. FMC acknowledged that FMC 57020 has the potential to leach in soil and, most likely, will contaminate ground water. The soil characteristics of FMC 57020 are very similar to atrazine (a compound known to leach). Will it be necessary to go below 12 inches of soil depth to show it will leach. Note: FMC said the field dissipation study is already underway.) Rather than deeper sampling, FMC offers to conduct modeling simulation studies to predict the extent of leaching.

EAB response: No, it will not be necessary to show that it leaches since the company acknowledges that the compound most likely will leach below 12 inches. However, in the registration submission, FMC should explain why soil was not sampled below 12 inches when FMC 57020 is known to leach. EAB recommended to FMC they contact Bob Holst for information concerning the PESTANS model or other modeling for information in this area.

2. When is a tank mix soil dissipation study necessary? FMC 57020 will be tank mixed with other pesticides.

EAB response: This data requirement has been deemphasized in the Guidelines. Given the list of chemicals to be tank mixed with FMC 57020, EAB is unable to predict circumstances that would trigger this data requirement. The registrant should be in a better position to know how their chemical would affect the other chemicals.

3. Must a fish accumulation study be conducted.

EAB response: Yes. Based on the facts that FMC 57020 is water soluble, is stable in water and will have the potential to reach water, a fish accumulation study will be necessary. However, EAB acknowledges that FMC 57020 has a low partition coefficient of 350.

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Note: In follow up comments after the meeting, EAB suggested that FMC become aware of the Agency's groundwater contamination policy (since FMC will have to conform to such policy). FMC should also become aware of the Toxicology Branch, HED, concerns for groundwater contamination.

FMC was told that the question may arise as to whether their chemical, FMC 57020 may in some way complex with chemicals with which it is tank mixed and leach/carry it also into groundwater. If a field monitoring study is required (based on model predictions), it may be necessary to monitor for the tank mixed chemical also. (This would be an example of when a tank mix soil dissipation study would be required.)

Clinton Fletcher  
Review Section No. 1  
Exposure Assessment Branch

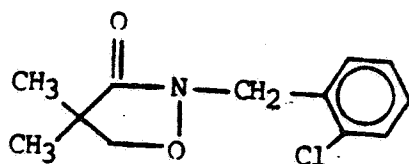
## 1.0 INTRODUCTION

FMC has submitted a letter summarizing points discussed in a pre-registration conference for the herbicide FMC 57020 being tested on soybeans under a current EUP. FMC requests confirmation of the points.

### 1.1 Chemical

Chemical name: 2-((2-chlorophenyl)-methyl)-4,4-dimethyl-3-isoxazolidinone

Chemical structure:



## 2.0 DISCUSSION

Points will be summarized and commented upon as listed in the FMC letter.

2.1 FMC point: EAB will accept a computer modeling study predicting extent of leaching to support registration of FMC 57020. FMC acknowledges that, based on lab studies, FMC 57020 will move downward in the soil profile and has the potential to end up in groundwater. EAB agrees there is no need to generate data to confirm this acknowledged potential.

EAB comment: However, it will be necessary for FMC to define the extent of leaching, in terms of depth and concentration of FMC 57020, with actual field data. In the soil dissipation study, if residues are found below the 6 inch soil level, then soil samples must be taken to sufficient soil depth to define the extent of leaching. EAB notes that soil samples are being taken at the 6-12 inch depth in the soil dissipation study.

2.2 FMC point: EAB stated that dissipation studies for tank mixes of FMC 57020 with other herbicides are not necessary at the present time.



EAB comment: EAB confirms that dissipation studies for tank mixes of FMC 57020 with other herbicides are not necessary.

2.3 FMC point: EAB stated that a fish accumulation study will be necessary to support registration of FMC 57020.

EAB comment: EAB confirms that a fish accumulation study will be necessary to support registration of FMC 57020.



Clinton Fletcher  
Review Section No. 1  
Exposure Assessment Branch  
Hazard Evaluation Division.

FMC 57020 HERBICIDE

SOYBEANS

o EXPERIMENTAL USE PERMIT (279-EUP-93)

1983: 800 ACRES, 2,400 LB. A.I., 29 STATES

1984: 935 ACRES, 2,805 LB. A.I., 29 STATES

o EXPERIMENTAL USE PERMIT/TEMPORARY TOLERANCE (PENDING)

1985: 70,000 ACRES, 70,000 LB. A.I., 29 STATES

o REGISTRATION APPLICATION/TOLERANCE PETITION

TO BE SUBMITTED: AUGUST, 1984

L618B24  
DD 30

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FMC 57020 HERBICIDE

SOYBEAN USE DIRECTIONS (PROPOSED)

USE FMC 57020 4 EC HERBICIDE AT A RATE OF 0.5 TO 1.25 POUNDS ACTIVE INGREDIENT (A.I.) (1.0 - 2.5 PINTS) PER ACRE IN A PREEMERGENCE BROADCAST, PREPLANT INCORPORATED, OR BAND APPLICATION. USE LOWER RATE FOR LOWER ORGANIC MATTER AND COARSER TEXTURED SOILS AND HIGHER RATE FOR HIGHER ORGANIC MATTER AND FINER TEXTURED SOILS.

APPLY IN A MINIMUM OF 10 GALLONS OF FINISHED SPRAY PER ACRE WITH GROUND EQUIPMENT OR 2 GALLONS PER ACRE BY AIR-CRAFT, OR APPLY IN A UNIFORM MANNER BY MEANS OF SPRINKLER IRRIGATION.

TANK MIXTURES - USE FMC 57020 4 EC HERBICIDE AT A RATE OF 0.5 TO 1.25 POUNDS A.I. (1.0 TO 2.5 PINTS) PER ACRE WITH METRIBUZIN HERBICIDE AT A RATE OF 0.1 TO 0.6 POUNDS A.I. PER ACRE OR LINURON HERBICIDE AT A RATE OF 0.3 TO 1.5 POUNDS A.I. PER ACRE.

R614A30  
RK21

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FMC 57020 HERBICIDE  
SOYBEAN USE DIRECTIONS (PROPOSED)

- o FMC 57020 4EC OR 6EC HERBICIDE
- o 0.5 TO 1.25 LBS AI/ACRE
- o BROADCAST APPLICATION (PRE-EMERGENCE OR PREPLANT) - MAIN USE
- o BAND APPLICATION
- o ALONE OR IN COMBINATION WITH METRIBUZIN OR LINURON (TANK MIX)

R59A5  
RK24

FMC 57020 HERBICIDE  
EPA LETTER OF JANUARY 10, 1984

PRIOR TO REGISTRATION AND FOR ANY PERMANENT TOLERANCE  
REQUEST, WE WILL NEED THE FOLLOWING:

OF THE ENVIRONMENTAL FATE DATA SUBMITTED, ONLY  
THAT WHICH WAS PERTINENT TO THIS EUP WAS REVIEWED  
AT THIS TIME. WE NOTE THAT FMC 57020 HAS A  
POTENTIAL TO LEACH INTO GROUNDWATER. WE RECOM-  
MEND THAT A FIELD DISSIPATION STUDY INCLUDE  
MONITORING FOR LEACHING AND FOR POTENTIAL GROUND-  
WATER CONTAMINATION IN SANDY SOILS LOW IN ORGANIC  
MATTER.

L13B1  
RK23

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158.130 ENVIRONMENTAL FATE DATA REQUIREMENTS

TERRESTRIAL FOOD CROP

DEGRADATION STUDIES - LAB

HYDROLYSIS ..... (R)\*  
PHOTODEGRADATION:  
  IN WATER ..... R  
  ON SOIL ..... CR  
  IN AIR ..... CR

METABOLISM

AEROBIC SOIL ..... (R)  
ANAEROBIC SOIL ..... R

MOBILITY STUDIES

LEACHING (ADSORPTION/DESORPTION) ..... R  
VOLATILITY  
  LAB ..... CR  
  FIELD ..... CR

DISSIPATION STUDIES - FIELD

SOIL ..... R  
SOIL, LONG TERM ..... CR

ACCUMULATION STUDIES

ROTATIONAL CROPS  
  CONFINED ..... (CR)  
  FIELD ..... CR  
  IN FISH ..... (CR)

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\*KEY: R = REQUIRED; CR = CONDITIONALLY REQUIRED; ( ) =  
BRACKETS (I.E., (R), (CR)) INDICATE REQUIREMENTS  
THAT APPLY WHEN AN EXPERIMENTAL USE PERMIT IS BEING  
SOUGHT.

FMC 57020

SOIL METABOLISM

BACKGROUND

FIELD SOIL DISSIPATION

PERSISTENCE

MOBILITY

PESTAINS MODELING

PREDICTED MOBILITY

VOLATILITY

FMC 57020 AEROBIC SOIL METABOLISM STUDY  
 MATERIAL BALANCE/PRODUCT DISTRIBUTION  
 2 MONTH INTERVAL .

	SANDY LOAM CARBONYL- <sup>14</sup> C	SILT LOAM RING- <sup>14</sup> C
FMC 57020	35.4	62.9
UNIDENTIFIED METABOLITES	3.1	1.6
POLAR RESIDUES	3.1	2.2
BOUND RESIDUES	9.4	11.2
CARBON DIOXIDE	49.0	22.1
TOTAL	100.0	100.0



FMC 57020 ANAEROBIC SOIL METABOLISM STUDY  
 MATERIAL BALANCE/PRODUCT DISTRIBUTION

	SILT LOAM RING- <sup>14</sup> C	
	30 DAY	60 DAY
FMC 57020	24.7	8.3
METABOLITE "A"	22.5	23.4
UNIDENTIFIED METABOLITES	7.4	7.1
POLAR RESIDUES	7.5	16.0
BOUND RESIDUES	14.4	16.4
CARBON DIOXIDE	23.5	28.8
TOTAL	100.0	100.0

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● RESULTS

AEROBIC

- DEGRADES AT MODERATE RATE
- DEGRADATION OCCURS VIA MINERALIZATION

ANAEROBIC

- MINERALIZATION PATHWAY IS SHUT DOWN
- PARENT COMPOUND IS CONVERTED TO METABOLITE "A"  
BY REDUCTION

FMC 57020

SOIL DISSIPATION STUDY

4 LOCATIONS

MIDWEST - SILT LOAM

NORTHEAST - SANDY LOAM

SOUTHEAST - SANDY CLAY LOAM

SOUTHWEST - SILT LOAM

TREATMENT

2 LB AI/A BROADCAST (PRE-PLANT INCORPORATED)

2 LB AI/A BROADCAST (PRE-EMERGENT)

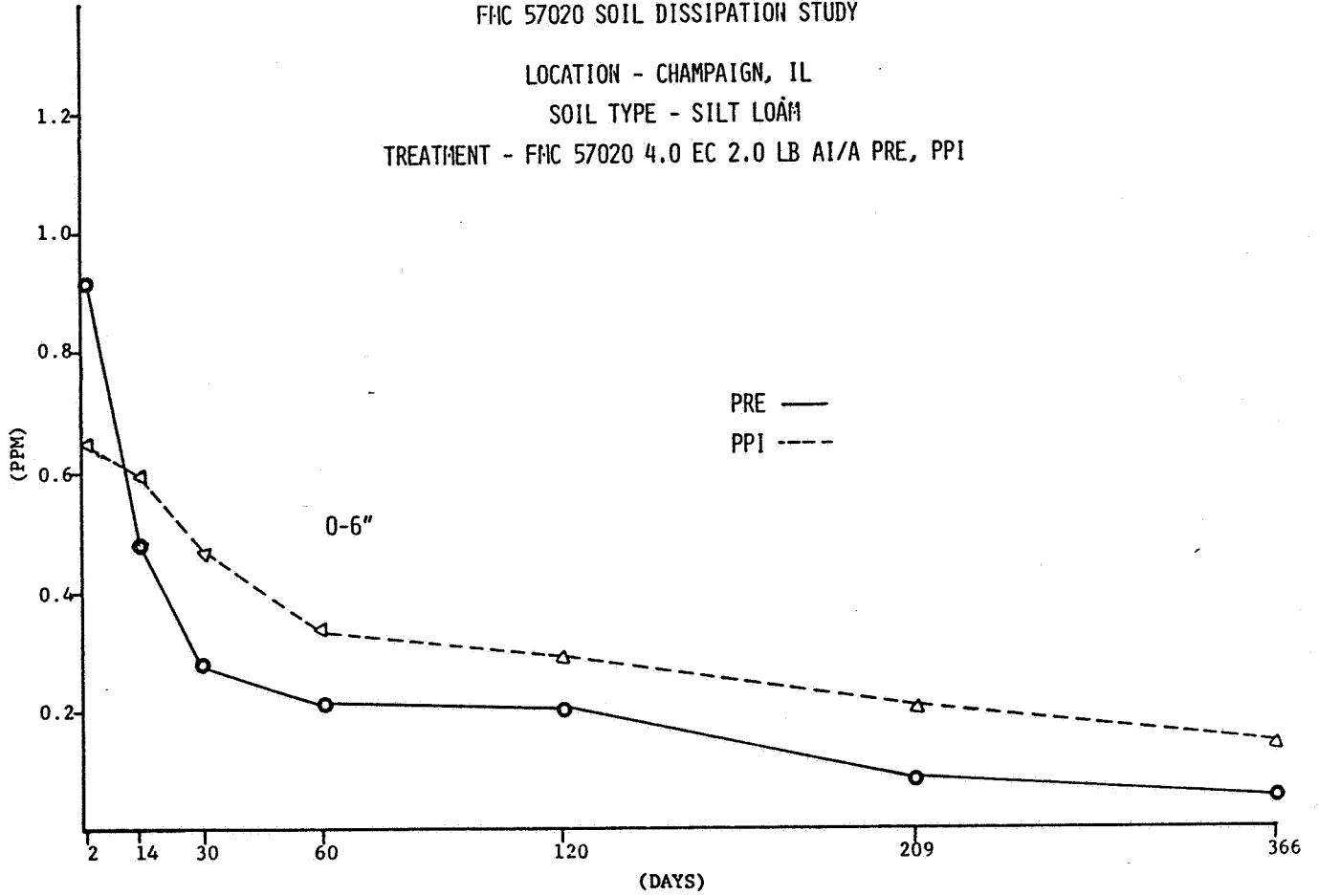
SAMPLING

a 0, 7, 14, 30, 60, 120, 150, 180, 360, 500 DAYS

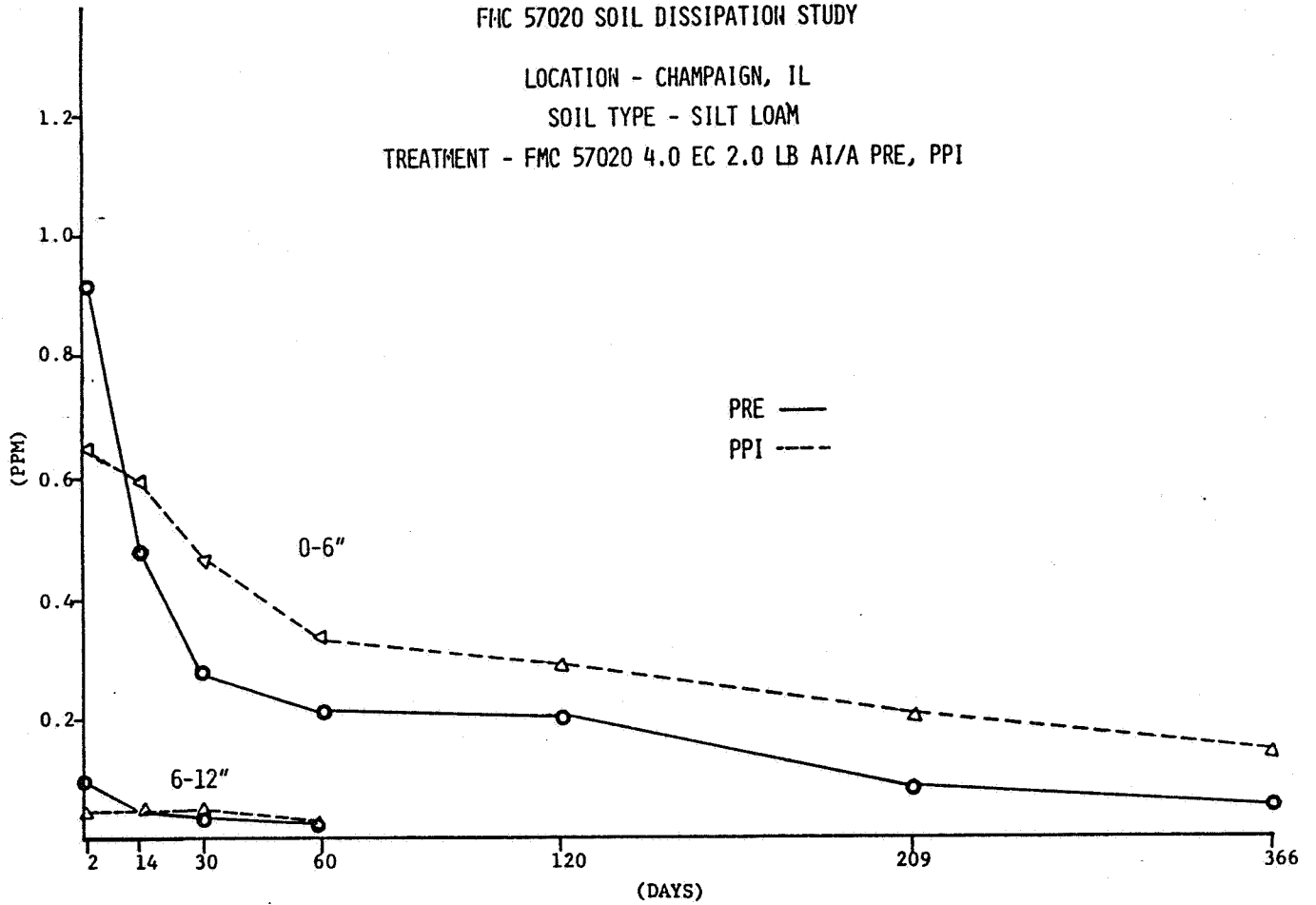
SOIL CORES

0-6" AND 6-12"

FHC 57020 SOIL DISSIPATION STUDY  
LOCATION - CHAMPAIGN, IL  
SOIL TYPE - SILT LOAM  
TREATMENT - FHC 57020 4.0 EC 2.0 LB AI/A PRE, PPI

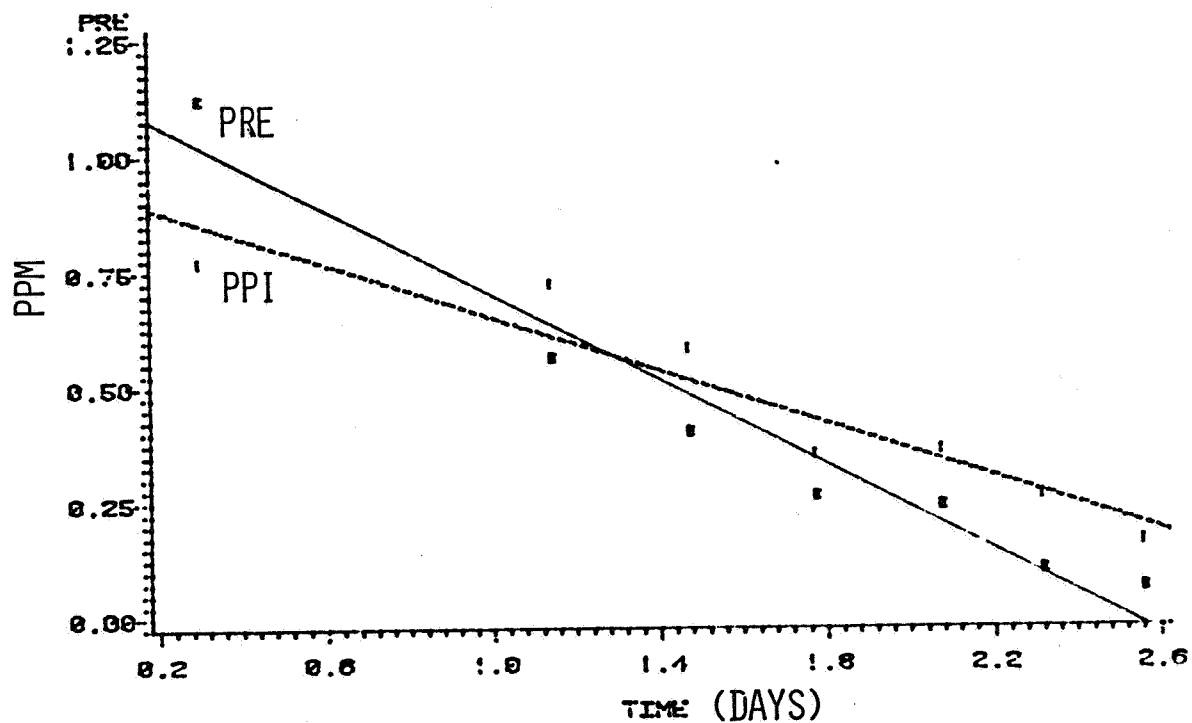


FMC 57020 SOIL DISSIPATION STUDY  
LOCATION - CHAMPAIGN, IL  
SOIL TYPE - SILT LOAM  
TREATMENT - FMC 57020 4.0 EC 2.0 LB AI/A PRE, PPI



# FMC57020 SOIL DISSIPATION DATA

L30-CHAMPN



	<u>CHAMPAIGN SILT LOAM</u>	<u>MARION SILT LOAM</u>	<u>P. GROVE SANDY LOAM</u>	<u>RALEIGH SANDY CLAY LOAM</u>
PRE HALF-LIFE	18	20	15	19
PPI HALF-LIFE	40	39	18	22

FMC 57020

SOIL MOBILITY

	<u>ATRAZINE</u>	<u>FMC 57020</u>
WATER SOLUBILITY	33 PPM	1100 PPM
SORPTION (K <sub>d</sub> )		
SAND	1.65	1.54
SANDY LOAM	9.37	2.82
SILT LOAM	30.3	6.85
CLAY LOAM	9.13	2.57
TLC CLASS (MOBILITY)		
SAND	4 (MOBILE)	3 (INTERMEDIATE)
SANDY LOAM	2 (LOW)	2 (LOW)
SILT LOAM	3 (INTERMEDIATE)	2 (LOW)
CLAY LOAM	3 (INTERMEDIATE)	2 (LOW)
FIELD SOIL HALF-LIFE	30-60 DAYS	20-40 DAYS
FIELD USE RATE	2.0-3.0 LB AI/A	0.50-1.25 LB AI/A

● SOIL MOBILITY EXPECTATION  
LOW TO INTERMEDIATE MOBILITY  
SIMILAR TO ATRAZINE

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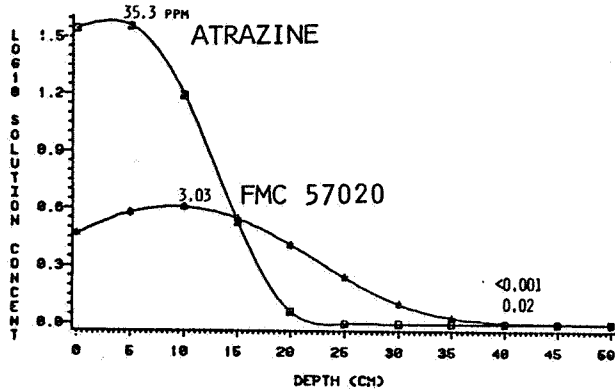
PESTANS SOIL PARAMETERS (FMC 57020)

	<u>SAND</u>	<u>SANDY LOAM</u>	<u>SILTY LOAM</u>	<u>CLAY LOAM</u>
SOLUBILITY	1100	1100	1100	1100
BULK DENSITY	1.50	1.50	1.50	1.50
DISPERSION COEFFICIENT	0.60	0.60	0.60	0.60
NO. OF APPLICATIONS	1.0	1.0	1.0	1.0
ACTIVE INGRED. KG AI/HA	1.12	1.12	1.12	1.12
DAYS BEFORE RECHARGE	1.0	1.0	1.0	1.0
RECHARGE RATE	15 & 30"	15"	15"	15"
SORPTION	1.54	2.82	6.85	2.57
SOIL POROSITY	0.395	0.435	0.485	0.476
WAVE COEFFICIENT	4.05	4.90	5.30	8.52
T 1/2	25	18 & 25	25 & 40	25



FMC57020 / ATRAZINE MOVEMENT IN SOIL

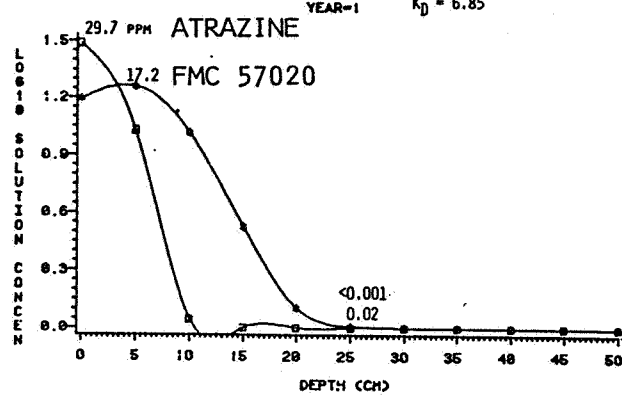
CLAY LOAM  
YEAR=1  
 $K_D = 2.57$



STAR = FMC 57020  
SQUARE = ATRAZINE

FMC57020 / ATRAZINE MOVEMENT IN SOIL

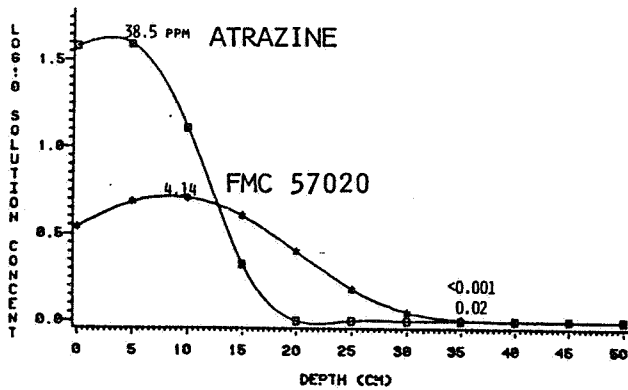
SILT LOAM  
YEAR=1  
 $K_D = 6.85$



STAR = FMC 57020  
SQUARE = ATRAZINE

FMC57020 / ATRAZINE MOVEMENT IN SOIL

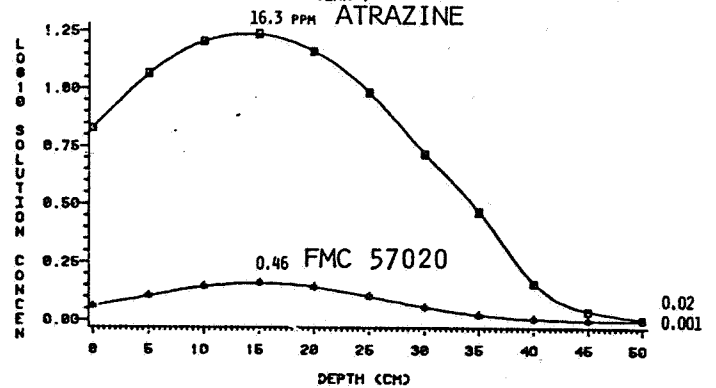
SANDY LOAM  
YEAR=1  
 $K_D = 2.82$



STAR = FMC 57020  
SQUARE = ATRAZINE

FMC57020 / ATRAZINE MOVEMENT IN SOIL

SAND  
YEAR=1  
 $K_D = 1.54$

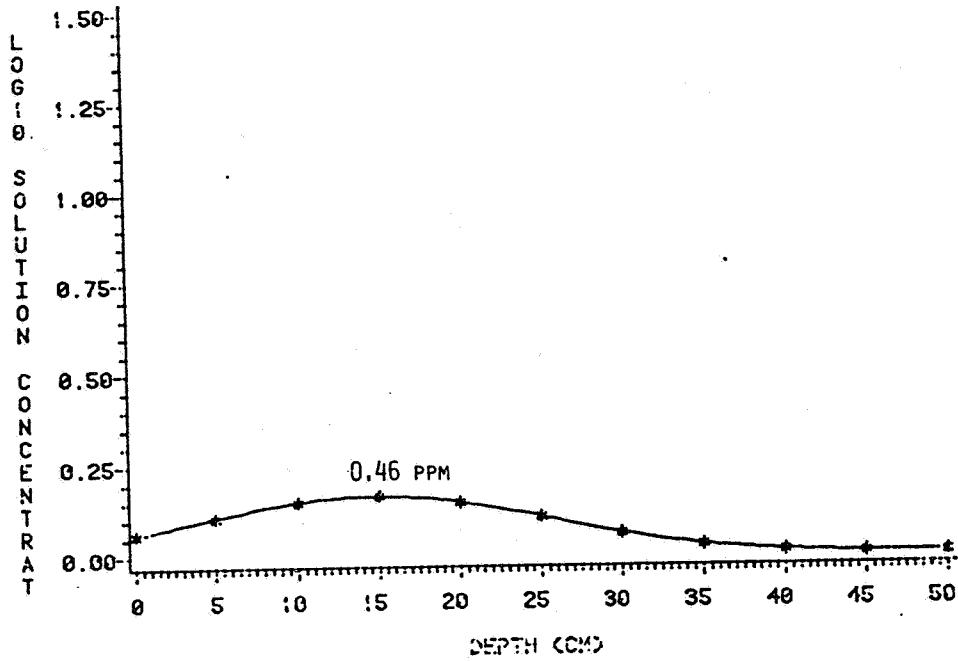


STAR = FMC 57020  
SQUARE = ATRAZINE

# FMC57020 MOVEMENT IN SOIL

SAND

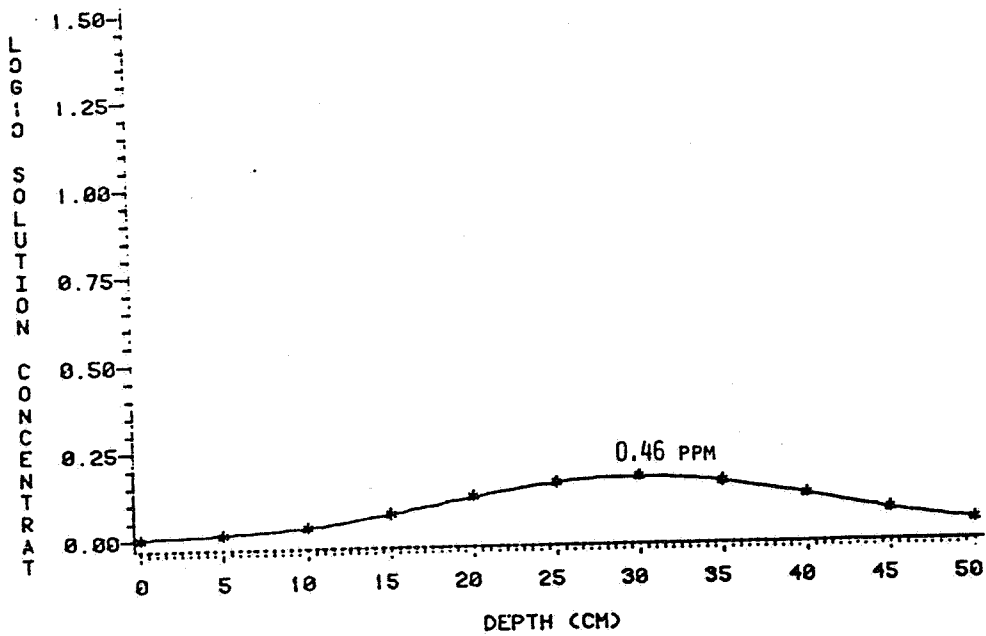
RECHARGE = 15"; YEAR = 1



# FMC 57020 MOVEMENT IN SOIL

SAND

RECHARGE = 30"; YEAR = 1

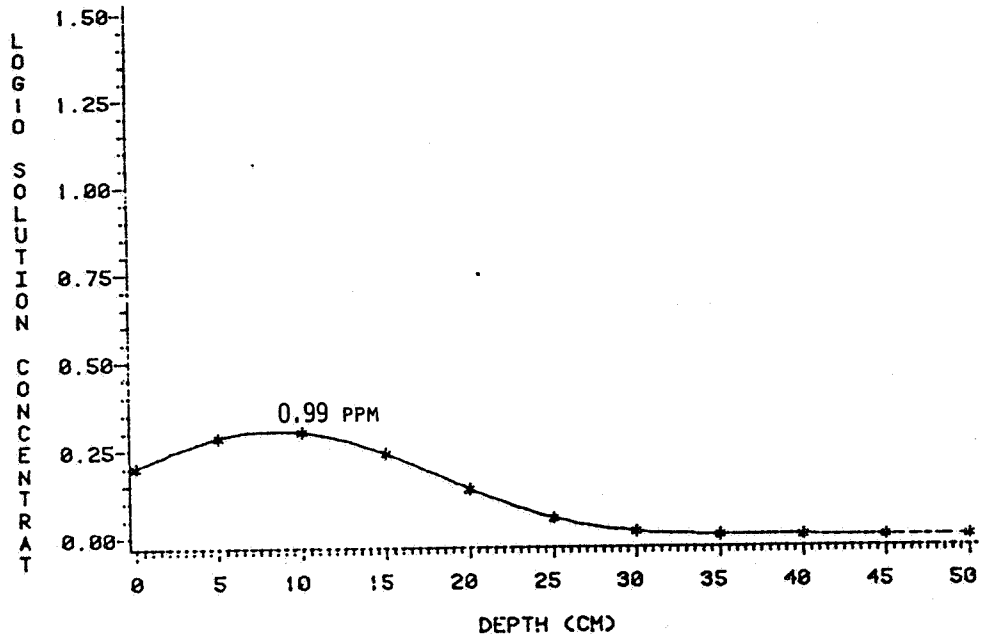


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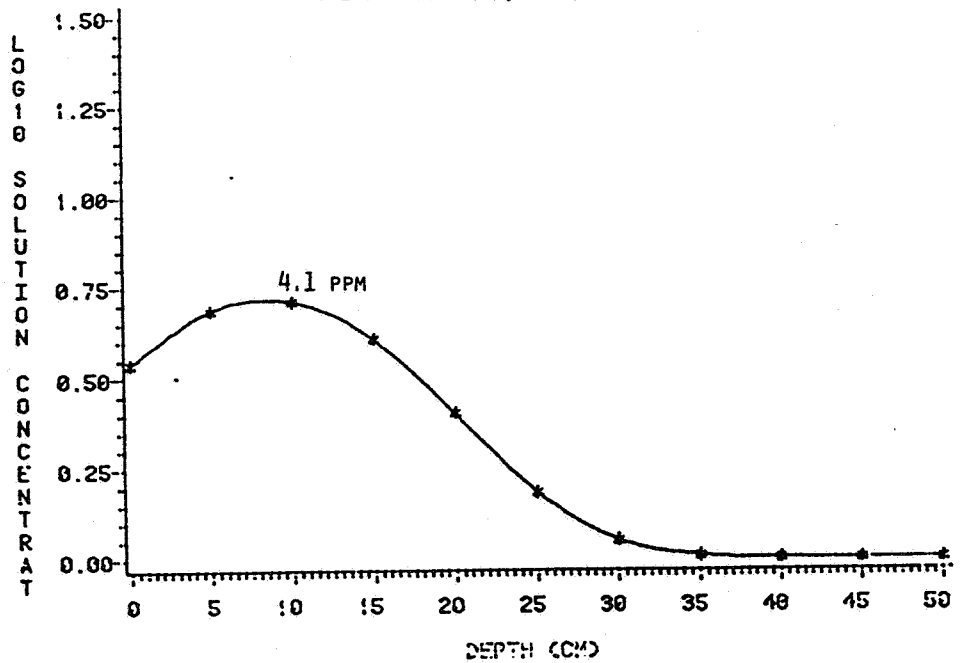
# FMC 57020 MOVEMENT IN SOIL

SANDY LOAM  
T 1/2 = 18 DAYS, YEAR = 1



# FMC57020 MOVEMENT IN SOIL

SANDY LOAM  
T 1/2 = 25 DAYS; YEAR = 1



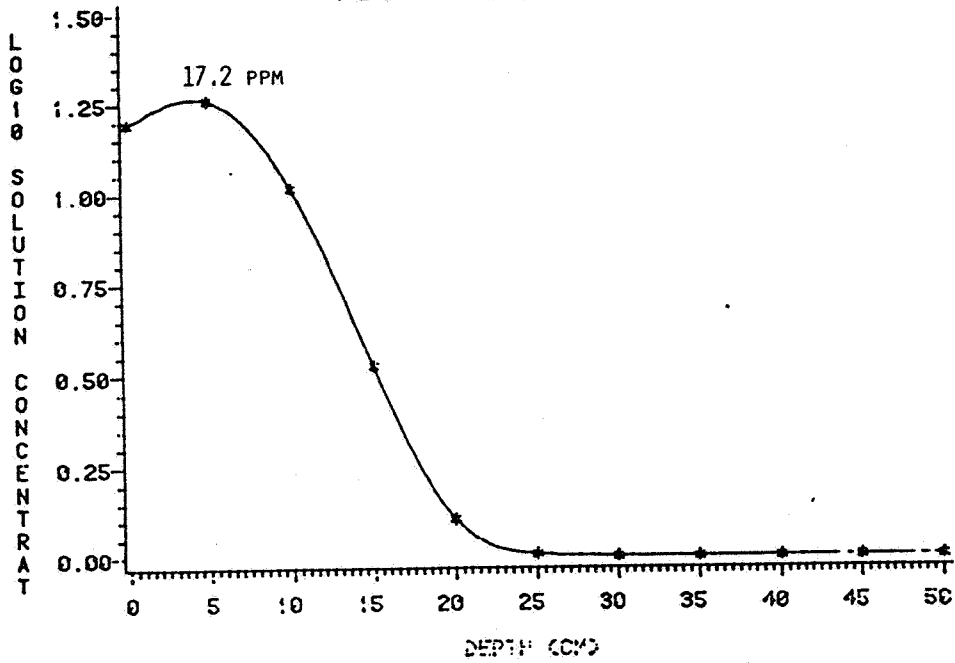
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# FMC57020 MOVEMENT IN SOIL

SILT LOAM

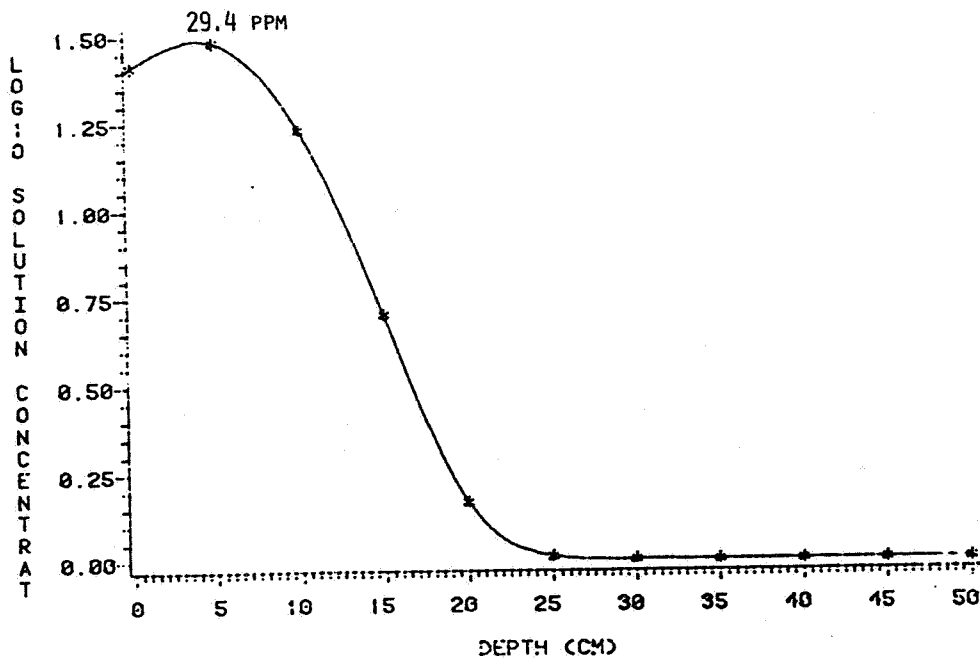
T 1/2 = 25 DAYS; YEAR = 1



# FMC 57020 MOVEMENT IN SOIL

SILT LOAM

T 1/2 = 40 DAYS; YEAR = 1



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FMC 57020  
CONCLUSIONS

- NOT SOIL PERSISTENT
- LOW SOIL MOBILITY
- LOW POTENTIAL FOR GROUNDWATER CONTAMINATION



VOLATILITY STUDY

40 CRF 158.130 REQUIREMENTS

- CASE-BY-CASE BASIS  
NEEDED?  
WHEN?