

US EPA ARCHIVE DOCUMENT

*file copy*

DP Barcode : D181934  
PC Code No : 129064 & 109702  
EEB Out :

01 5 1992

To: George LaRocca  
Product Manager 23  
Registration Division (H7505C)

From: Douglas J. Urban, Acting Chief  
Ecological Effects Branch/EFED (H7507C)

Attached, please find the EEB review of...

Reg./File # : 279-3124  
Chemical Name : Cypermethrin (109702) and zeta cypermethrin (129064)  
Type Product : Insecticide - Pyrethroid  
Product Name :  
Company Name : FMC Corporation  
Purpose : Review study which is revised report of MRID 419682-12 on  
cypermethrin (109702)

Action Code : 575 Date Due : 11/03/92  
Reviewer : Renee Lamb

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) | 424110-01 | Y   | 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) |         |     |
| 71-4(B) |         |     | 72-3(E) |           |     | 123-1(B) |         |     |
| 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(C) |         |     |         |           |     | 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: D181934

CASE: 048940  
SUBMISSION: S424235

DATA PACKAGE RECORD  
BEAN SHEET

DATE: 08/25/92  
Page 1 of 1

\* \* \* CASE/SUBMISSION INFORMATION \* \* \*

CASE TYPE: REGISTRATION ACTION: 575 CON REG FLW-UP DAT REQ HE  
CHEMICALS: 129064 Cyano(3-phenoxyphenyl) methyl(+/-) cis/trans 3-(2, 88.0000%

ID#: 000279-03124 FURY TECHNICAL  
COMPANY: 000279 FMC CORP.

PRODUCT MANAGER: 13 GEORGE LARocca

703-305-6100 ROOM: CM2 204

PM TEAM REVIEWER: ADAM HEYWARD

703-305-5021 ROOM: CM2 202

RECEIVED DATE: 07/22/92 DUE OUT DATE: 11/09/92

\* \* \* DATA PACKAGE INFORMATION \* \* \*

DP BARCODE: 181934 EXPEDITE: N DATE SENT: 08/25/92 DATE RET.: / /  
CHEMICAL: 129064 Cyano(3-phenoxyphenyl) methyl(+/-) cis/trans 3-(2,2-dichloro

DP TYPE: 001 Submission Related Data Package

ADMIN DUE DATE: 11/03/92

CSF: N

LABEL: N

ASSIGNED TO DATE IN DATE OUT

DIV : EFED

BRAN: EEB

SECT: RS1

REVR :

CONTR:

08/26/92

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\* \* \* DATA REVIEW INSTRUCTIONS \* \* \*

Attached for your review, acute toxicity to sheepshead  
minnow study (GRN 72-3) (MRID NO. 424110-01) submitted in  
support of the conditional registration for cypermethrin-s  
on cotton, lettuce and pecans.

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

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

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

OCT 5 1992

MEMORANDUM

Subject: Response to comments submitted by FMC Corp. for  
Cypermethrin minus (129064) and Cypermethrin (109702)

From: Doug Urban, Acting Branch Chief  
Ecological Effects Branch  
Environmental Fate and Effects Division (H7507C) *Doug Urban* 10/11/92

To: George LaRocca, PM 13  
Registration Division (H7505C)

The Ecological Effects Branch has reviewed the revised Sheepshead minnow study (MRID No. 424110-00) submitted by FMC Corporation. The study was previously reviewed on 4/2/92 (MRID No. 419682-12), and was classified as invalid. The report was poorly written and inconsistent.

The revised report addresses the concerns of the previous review, and as noted in a previous memo (attached), EEB will accept the data upon receipt of this report. Although there were discrepancies from the protocol, the study will be upgraded to core. The 96 hour  $LC_{50}$  for sheepshead minnow exposed to cypermethrin under flow through conditions is  $3.42 \mu\text{g/L}$  with 95 percent confidence limits of 1.89 to  $4.07 \mu\text{g/L}$ , classifying cypermethrin as very highly toxic to estuarine fish.. The NOEC is  $1.89 \mu\text{g/L}$ .

If there are any questions, contact Renee Lamb at 305-5294.

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## DATA EVALUATION RECORD

1. **CHEMICAL:** Cypermethrin-S (~~Fury~~ Technical).  
Shaughnessey Number: 129064. 109702
2. **TEST MATERIAL:** FMC 45806; Lot No. PL89-63; 91.5% active ingredient; a thick, brown liquid. *Flow through* *KL 11/5/92*
3. **STUDY TYPE:** Estuarine Fish ~~Static~~ Acute Toxicity Test.  
Species Tested: Sheepshead Minnow (*Cyprinodon variegatus*).
4. **CITATION:** Chandler, A.B. 1990. FMC 45806: Acute Toxicity to Sheepshead Minnow (*Cyprinodon variegatus*) Under Flow-Through Test Conditions. Laboratory Project No. 3903026-0350-3140. Study performed by Environmental Science and Engineering, Inc., Gainesville, FL. Submitted by FMC Corporation, Philadelphia, PA. EPA MRID No. 419682-12.

5. **REVIEWED BY:**

Rosemary Graham Mora, M.S.  
Associate Scientist  
KBN Engineering and  
Applied Sciences, Inc.

Signature: *Rosemary Mora*Date: *3/10/92*  
*Renee Lamb 3/13/92*6. **APPROVED BY:**

Pim Kosalwat, Ph.D.  
Senior Scientist  
KBN Engineering and  
Applied Sciences, Inc.

Signature: *P. Kosalwat*Date: *3/10/92*

Henry T. Craven, M.S.  
Supervisor, EEB/EFED  
USEPA

Signature: *Henry T. Craven*Date: *4/1/92*

7. **CONCLUSIONS:** This study is not scientifically sound and does ~~not~~ meet the guideline requirements for a flow-through acute toxicity study using estuarine fish. Measured concentrations varied greatly from test initiation to test termination, therefore, the actual concentrations to which the organisms were exposed are unknown. In addition, there were several inconsistencies within the report which cast doubt on the validity of the study. The 96-hour  $LC_{50}$  of FMC 45806 for *Cyprinodon variegatus* was ~~3.43~~ <sup>3.42</sup>  $\mu\text{g a.i./l}$  measured concentration which classifies FMC 45806 as very highly toxic to *Cyprinodon variegatus*. According to the author's report, the NOEC was ~~2.14~~ <sup>1.89</sup>  $\mu\text{g/l}$ .

8. **RECOMMENDATIONS:** N/A.

*Concluded 9/29/92*

\* Although there were discrepancies from protocol, this study will be upgraded to core. This study is being used as a comparison between the toxicity of cypermethrin and zeta-cypermethrin + analysis of the dose response data. The  $LC_{50}$  value is unlikely to change significantly in a new study.

Mean measured concentrations presented in Table 3-3, 3-6, and 3-7 (pages 15, 18, and 19, attached) of the report are not consistent with those presented in Table 3-1 (page 13, attached).

On pages 10 and 11, the author reports that 14 test aquaria were used in the test system and 20 fish were distributed to each test chamber. This would lead the reader to believe that 40 fish were used at each test concentration. However, the cumulative number of fish dead and the percent mortality data indicate that only 20 organisms were used per concentration level.

B. Statistical Analysis: The reviewer used EPA's Toxanal computer program to determine the 96-hour  $LC_{50}$  value and 95% confidence interval using the mean measured concentrations (Table 3-1, attached) with mortality data reported in the text (page 12, attached) (printout attached). The 96-hour  $LC_{50}$  (confidence interval) was  $3.43 \mu\text{g a.i./l}$  (0 to infinity). Since there were several inconsistencies noted in the report, the reviewer's results are used.

C. Discussion/Results: This study is not scientifically sound and does not meet the guideline requirements for a flow-through toxicity study using estuarine fish. The measured test concentrations varied greatly from test initiation to test termination, therefore, the actual concentrations to which the test organisms were exposed are unknown. In addition, there were many inconsistencies within the report which cast doubt on the validity of the test. The 96-hour  $LC_{50}$  of FMC 45806 to *Cyprinodon variegatus* was  $3.43 \mu\text{g a.i./l}$ , based on mean measured concentrations. According to the author's report, the NOEC was  $2.14 \mu\text{g/l}$ .

D. Adequacy of the Study:

(1) Classification: Invalid. *core 2L 9/29/92*

(2) Rationale: 1) The measured concentrations varied greatly from test initiation to test termination.  
2) There were several inconsistencies within the report which cast doubt on the validity of the test.

(3) Repairability: ~~NO.~~ *N/A*

15. COMPLETION OF ONE-LINER FOR STUDY: Yes, March 9, 1992.



r lamb fmc 45806 sheep

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| CONC. | NUMBER<br>EXPOSED | NUMBER<br>DEAD | PERCENT<br>DEAD | BINOMIAL<br>PROB. (PERCENT) |
|-------|-------------------|----------------|-----------------|-----------------------------|
| 4.07  | 20                | 14             | 70              | 5.765915                    |
| 1.89  | 20                | 0              | 0               | 9.536742E-05                |
| .675  | 20                | 0              | 0               | 9.536742E-05                |
| .531  | 20                | 0              | 0               | 9.536742E-05                |
| .393  | 20                | 0              | 0               | 9.536742E-05                |

THE BINOMIAL TEST SHOWS THAT 1.89 AND +INFINITY CAN BE  
USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT  
CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL  
ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 3.425765

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE  
PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE  
NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

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