

US EPA ARCHIVE DOCUMENT

12-12-94

MRID No. 404675-01

DATA EVALUATION RECORD

- 1. **CHEMICAL:** Mancozeb.
Shaughnessey No. 014504.
- 2. **TEST MATERIAL:** Dithane Flowable (F45); Lot No. 2-4262; 37% active ingredient; a tan liquid.
- 3. **STUDY TYPE:** 72-1(d) - Freshwater Fish Static Acute Toxicity Test. Species Tested: Rainbow Trout (*Oncorhynchus mykiss*).
- 4. **CITATION:** Bowman, J.H. 1987. Acute Toxicity of Dithane® Flowable (F45) to Rainbow Trout (*Salmo gairdneri*). Final Report No. 36281. Rohm and Haas Report No. 87RC-0056. Prepared by Analytical Bio-Chemistry Laboratories, Inc., Columbia, MO. Submitted by Rohm and Haas Company, Spring House, PA. EPA MRID No. 404675-01.
- 5. **REVIEWED BY:**
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Date: 12/12/94
- 6. **APPROVED BY:**
Henry T. Craven, Section Head 4
Ecological Effects Branch
Environmental Fate and Effects Division
Signature: *Henry T. Craven*
Date: 12/12/94
- 7. **CONCLUSIONS:** This study is scientifically sound and satisfies the guideline requirement for a freshwater fish static toxicity test with a formulated product. The 96-hour LC₅₀ of Dithane Flowable (F45) for rainbow trout is 1.1 mg/l of product, nominal concentration, which classifies the formulated product as "moderately toxic" to rainbow trout. The NOEC for the formulated product is 0.32 mg/l nominal concentration.
- 8. **RECOMMENDATIONS:** N/A.
- 9. **BACKGROUND:**
- 10. **DISCUSSION OF INDIVIDUAL TESTS:** N/A.

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5. **REVIEWED BY:**

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Date: 12/14/91

7. **CONCLUSIONS:** This study is scientifically sound but does not meet the guideline requirements for a freshwater fish static toxicity test because the test was not conducted with the technical grade of the active ingredient. The 96-hour LC₅₀ of Dithane Flowable (F45) for rainbow trout was 0.41 mg a.i./L nominal concentration of formulated product. Therefore Dithane Flowable is classified as highly toxic to rainbow trout. The NOEC was estimated as 0.12 mg a.i./L nominal concentration.

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

6 hrs
Core for formulated product
2

11. MATERIALS AND METHODS:

- A. Test Animals: Rainbow trout (*Salmo gairdneri*) were obtained from Mt. Lassen Trout Farms in Red Bluff, CA. The fish were held in laboratory culture tanks for at least 14 days prior to testing. They were fed a commercially available fish food daily with occasional supplements of brine shrimp nauplii. The laboratory was maintained on a 16-hour daylight photoperiod. The fish were acclimated to the test temperature and dilution water. Feeding was discontinued 48-96 hours prior to testing. The mean weight and length of the control group at test termination were 0.71 (± 0.31) g and 36 (± 4.4) mm, respectively.
- B. Test System: The test was conducted in 5-gallon glass vessels containing 15 L of soft, reconstituted water. The water was prepared using 48 mg NaHCO_3 , 30 mg $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$, 30 mg MgSO_4 , and 2 mg KCl per liter of deionized water to give a total hardness of 40-48 mg/L as CaCO_3 , a total alkalinity of 25-35 mg/L as CaCO_3 , and an initial pH of 7.2-7.6. The test vessels were held in a water bath set to maintain $12^\circ \pm 1^\circ \text{C}$.
- C. Dosage: Ninety-six-hour static test. Based on preliminary tests, six nominal concentrations (0.10, 0.18, 0.32, 0.56, 1.0, and 1.8 mg/L) and a dilution water control were used. The concentrations made were based on the total product (tested as a formulation). Working stocks were prepared in the test water.
- D. Design: Within 30 minutes of test material addition, 10 rainbow trout were randomly distributed to each vessel; one vessel per concentration. The biomass loading rate in the control was 0.47 g/L. Observations of mortality and sublethal responses were made every 24 hours. Dead fish were removed from the containers at the observation periods. The temperature, dissolved oxygen (D.O.), and pH were measured in the control, low, middle, and high concentrations containing live fish after 0, 48, and 96 hours.
- E. Statistics: The median lethal concentration (LC_{50}) and associated 95% confidence interval (C.I.) for each 24-hour interval were calculated using a computer program developed by Stephan et al. (1978).

12. **REPORTED RESULTS:** The responses of rainbow trout are given in Table 3 (attached). The 96-hour LC_{50} value was 1.1 mg/L (95% C.I. = 0.85-1.4 mg/L). The no-observed-effect concentration (NOEC) was determined to be 0.32 mg/L.

Dissolved oxygen ranged from 6.3 to 9.1 mg/L or 62 to 88% of saturation. The pH values ranged from 7.1 to 7.8. The temperature was reported as 12°-13°C throughout the test.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:**

The author presented no conclusions.

Quality Assurance and Study Compliance statements were included in the report, indicating that the study was conducted in accordance with FIFRA Good Laboratory Practice Standards set forth in 40 CFR Part 160.

14. **REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS:**

- A. **Test Procedure:** The test procedures were generally in accordance with protocols recommended by the guidelines, but deviated as follows:

The length of the acclimation period to the test water and temperature was not provided in the report. An acclimation period of at least two weeks is recommended.

The alkalinity, hardness, and conductivity of the test solutions were not measured during the test.

The test temperature was not monitored every six hours as recommended.

- B. **Statistical Analysis:** Results obtained from EPA's toxanol program agree with those reported by the study author (see attached printout).

- C. **Discussion/Results:** This study is scientifically sound and meets the guideline requirements for a freshwater fish static toxicity test with a formulated product. The 96-hour LC_{50} of Dithane Flowable (F45) for rainbow trout is 1.1 mg/l nominal concentration, which classifies the formulated product as "moderately toxic" to rainbow trout. The NOEC is 0.32 mg/l.

D. Adequacy of the Study:

(1) Classification: Core, for the formulated product.

(2) Rationale: N/A.

(3) Repairability: N/A.

15. COMPLETION OF ONE-LINER FOR STUDY: Yes, 12/09/94.

Mancozeb

Page 6 is not included in this copy.

Pages _____ through _____ 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.
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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.

MANCOZEB SALMO GAIRDNERI

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
1.8	10	10	100	9.765625E-02
1	10	2	20	5.46875
.56	10	1	10	1.074219
.32	10	0	0	9.765625E-02
.18	10	0	0	9.765625E-02
.1	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT .56 AND 1.8 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 1.203225

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
2	.1677541	1.108247	.896505	1.426811

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
8	.3107891	1	.3703616

SLOPE = 6.497643
 95 PERCENT CONFIDENCE LIMITS = 2.875307 AND 10.11998

LC50 = 1.092436
 95 PERCENT CONFIDENCE LIMITS = .8525316 AND 1.418352

LC10 = .696531
 95 PERCENT CONFIDENCE LIMITS = .3706673 AND .8837392
