

US EPA ARCHIVE DOCUMENT

9-6-88

Accession Number 406386-24

DATA EVALUATION RECORD

1. **CHEMICAL:** MON 7200/MON 15100
2. **TEST MATERIAL:** MON 7200, 91.5% purity, an orange solid.
3. **STUDY TYPE:** Freshwater Fish Acute Static Test.
Species Tested: Lepomis macrochirus.
4. **CITATION:** Bowman, J. H. 1987. Acute Toxicity of MON 7200 to Bluegill Sunfish (Lepomis macrochirus). Prepared by Analytical Bio-Chemistry Laboratories, Inc., Columbia, Missouri. Submitted by Monsanto Agricultural Company, St. Louis, Missouri. Study Number 36024/AB-87-89. Accession Number 406386-24.
5. **REVIEWED BY:**

Prapimpan Kosalwat, Ph.D.
Staff Toxicologist
KBN Engineering and
Applied Sciences, Inc.

Signature: P. Kosalwat
Date: 7/25/88
6. **APPROVED BY:**

Isabel C. Johnson, M.S.
Principal Scientist
KBN Engineering and
Applied Sciences, Inc.

Signature: Isabel C. Johnson
Date: 7-26-88

for Henry T. Craven
Supervisor, EEB/HED
USEPA

Signature: Richard M. Lee
Date: 9/6/88
7. **CONCLUSIONS:** This study is scientifically sound and meets the guideline requirements for a freshwater fish acute test. With an LC50 value of 0.47 mg a.i./L mean measured concentration, MON 7200 is considered highly toxic to Lepomis macrochirus. The NOEC was determined to be 0.20 mg a.i./L mean measured concentration.
8. **RECOMMENDATIONS:** N/A.

9. **BACKGROUND:** MON-15100 and MON-7200 are Monsanto designations for the same active ingredient. MON-15151 is the designation for the 1 pound a.i. per gallon emulsifiable concentrate (1EC) formulation.
10. **DISCUSSION OF INDIVIDUAL TESTS:** N/A.
11. **MATERIALS AND METHODS:**
- A. **Test Animals:** The bluegill sunfish (Lepomis macrochirus) used in the test were obtained from Osage Catfisheries in Osage Beach, Missouri. All test fish were held in culture tanks on a 16-hour daylight photoperiod and observed for at least 14 days prior to testing. During this period, the fish received a standard commercial fish food occasionally supplemented with brine shrimp nauplii (Artemia sp.) daily until 48-96 hours prior to testing at which time feeding was discontinued. The bluegill sunfish used in this experiment had a mean weight of 0.58 (\pm 0.18) g and a mean standard length of 27 (\pm 2.8) mm.
- B. **Test System:** The static fish bioassay was conducted in five-gallon glass vessels containing 15 liters of soft reconstituted water. The water had an initial pH of 7.2-7.6; and a total hardness and a total alkalinity of 40-48 and 25-35 mg/L as CaCO₃, respectively. The 0-hour measured control water parameters of this dilution water were dissolved oxygen 9.3 mg/L and pH 7.5. The test vessels were kept in a water bath at 22 \pm 1.0°C. The test fish were acclimated to the dilution water prior to testing.
- C. **Dosage:** 96-hour acute static LC50 test.
- D. **Design:** Based on the results of preliminary testing and a previous definitive test, five nominal concentrations of the test compound (0.32, 0.56, 1.0, 1.8, and 3.2 mg/L), with ten fish per concentration, were selected for the definitive bioassay. Also included were a dilution water control and a solvent control chamber. All test concentrations were corrected for sample purity. The solvent control chamber received a 1.6 ml aliquot of dimethylformamide (DMF), which was equivalent to the highest amount used in any test solution.

The fish were added to the test chambers by random assignment within 30 minutes after addition of test material. The loading biomass of fish per test chamber was 0.39 g/L. All test organisms were observed once

every 24 hours for mortality and abnormal (sub-lethal) effects. Any dead individuals were removed from the test chambers after each 24-hour observation.

E. Statistics: Statistical analyses were obtained using Stephan's computer program.

12. REPORTED RESULTS: Table 3 (attached) presents mortality rates and water quality measurements during the exposure period. Water temperature, dissolved oxygen concentration, and pH were within acceptable limits throughout the study. The 24-, 48-, and 96-hour LC50 values for MON 7200 were 0.93, 0.75, and 0.70 mg/L nominal concentrations, respectively. The 96-hour no-observed-effect concentration (NOEC) was estimated to be 0.32 mg/L, the lowest concentration tested, based on the lack of mortality or observed abnormal (sub-lethal) effects. The abnormal effects of mortality, loss of equilibrium, fish on the bottom of test chamber and/or excitability were observed in 0.56, 1.0, 1.8, and 3.2 mg/L test concentrations during the exposure period.

All solutions had a light surface film and the amount of film increased with the concentrations at 0 hour. The surface film was no longer visible on the surface of the 0.32 to 1.0 mg/L chambers after 24 hours. The 1.8- and 3.2-mg/L solutions had a light surface film throughout the 96-hour test period.

13. STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES: No conclusion was made by the author. The study was conducted following the intent of the Good Laboratory Practice Regulations and the final report was reviewed and signed by the Quality Assurance Unit of Analytical Bio-Chemistry Laboratories, Inc.

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

- A. Test Procedure: The test procedure was generally in accordance with the SEP guidelines, except for the following deviations:
- o The age of test fish was not reported.
 - o Each nominal test concentration was less than 60% (approximately 56%) of the next highest concentration.
 - o There was no 15- to 30-minute transition period between light and dark photoperiod.

o The test temperature was measured every 48 hours. If temperature is controlled by a water bath, the SEP recommends that measurements be recorded every six hours.

o In Table 2 of Appendix II (attached), the analysis of MON 7200 showed the unit of test levels as mg/mL, which contradicts the unit of mg/L used throughout the report. The reviewer checked the stock solution preparation record on page 26 and it confirmed that the concentrations were actually in mg/L unit.

B. Statistical Analysis: Since chemical analysis of the test solutions was conducted at the beginning and end of the test and the analysis showed lower concentrations than the nominal concentrations, the estimation of LC50 value using mean measured concentrations would have reflected a more accurate toxicity result. The reviewer recalculated the 96-hour LC50 value with mean measured concentrations in Table 2 of Appendix II (attached), using EPA's TOXANAL computer program (attached) and reported it as a result of this study.

C. Discussion/Results: A 96-hour LC50 value, calculated using mean measured concentrations, was 0.47 mg a.i./L (95% confidence limits of 0.33-0.83 mg a.i./L). This LC50 value classifies MON 7200 as highly toxic to bluegill sunfish. The NOEC was determined to be 0.20 mg a.i./L mean measured concentration.

D. Adequacy of the Study:

(1) Classification: Core.

(2) Rationale: Although the test procedure deviated from the recommended protocol, the reviewer does not believe that it significantly affected the toxicity results.

(3) Repairability: N/A.

15. COMPLETION OF ONE-LINER: Yes, July 18, 1988.

Dithiopyr Science Reviews

Page _____ is not included in this copy.

Pages 5 through 6 are not included in this copy.

The material not included contains the following type of information:

- _____ Identity of product inert ingredients.
- _____ Identity of product inert impurities.
- _____ Description of the product manufacturing process.
- _____ Description of product quality control procedures.
- _____ Identity of the source of product ingredients.
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REPORT FOR THE REPORTS MAINTENANCE UNIT

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COND.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	EDWINSON 95% PERCENT
100	10	10	100	9.755000E-01
101	10	10	100	9.755000E-01
102	10	10	100	9.755000E-01
103	10	0	0	1.074019
104	10	0	0	9.755000E-01

THE EDWINSON TEST SHOWS THAT 100 AND 103 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 LOSS FOR THIS SET OF DATA IS 474848P

WHEN THERE ARE ZERO THAN TWO CONCENTRATIONS AT WHICH THE
PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE
OR THE WRIGHT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

No. _____

Chemical Name MON 7200 Chemical Class _____ Page 1 of

Study/Species/Lab/
Succession _____ Chemical
a.i. _____

Results

Reviewer/
Date _____ Validity:
Status _____

14-Day Single Dose Oral LD50

LD50 = mg/kg (95% C.L.) Contr. Mort.(%) = _____

Species _____

Slope = _____ # Animals/Level = _____ Age(Days) = _____
Sex = _____

Lab _____

14-Day Dose Level mg/kg/(% Mortality)
(), (), (), (), ()

Acc. _____

Comments: _____

14-Day Single Dose Oral LD50

LD50 = mg/kg. (95% C.L.) Contr. Mort.(%) = _____

Species _____

Slope = _____ # Animals/Level = _____ Age(Days) = _____
Sex = _____

Lab _____

14-Day Dose Level mg/kg/(% Mortality)
(), (), (), (), ()

Acc. _____

Comments: _____

8-Day Dietary LC50

LC50 = ppm (95% C.L.) Contr. Mort.(%) = _____

Species _____

Slope = _____ # Animals/Level = _____ Age(Days) = _____
Sex = _____

Lab _____

8-Day Dose Level ppm/(Mortality)
(), (), (), (), ()

Acc. _____

Comments: _____

8-Day Dietary LC50

LC50 = ppm (95% C.L.) Contr. Mort.(%) = _____

Species _____

Slope = _____ # Animals/Level = _____ Age(Days) = _____
Sex = _____

Lab _____

8-Day Dose Level ppm/(Mortality)
(), (), (), (), ()

Acc. _____

Comments: _____

8-Day Dietary LC50

LC50 = ppm (95% C.L.) Contr. Mort.(%) = _____
Sol. Contr. Mort.(%) = _____

Species _____

Slope = _____ # Animals/Level = _____ Temperature = _____

Lab _____

96-Hour Dose Level ppm/(Mortality)
(), (), (), (), ()

Acc. _____

Comments: _____

96-Hour LC50

LD50 = 0.47 ppm * (95% C.L.) (0.33-0.83) Contr. Mort.(%) = 0
Sol. Contr. Mort.(%) = 0

Species Lepomis macrochirus

Slope = N/A # Animals/Level = 10

Temp. = 22°C

PK/7-18-88 Core

Lab Analytical Bio-

96-Hour Dose Level ppm/(Mortality)
0.20(0), 0.33(10), 0.83(100), 1.70(100), 2.80(100)

Chemistry Laboratories, Inc.

Acc. 406386-24

Comments: * mean measured concentration (a.i.)

96-Hour LC50

LD50 = ppm (95% C.L.) Contr. Mort.(%) = _____
Sol. Contr. Mort.(%) = _____

Species _____

Slope = _____ # Animals/Level = _____ Temperature = _____

Lab _____

96-Hour Dose Level ppm/(Mortality)
(), (), (), (), ()

Acc. _____

Comments: _____