6/15/88

Accession Number 404892-03

DATA EVALUATION RECORD

1. **CHEMICAL:** Rovral 50 WP

2. **TEST MATERIAL:** Formulation: Rovral 50 WP, 50% active ingredient as Iprodione, a tan-colored powder.

3. **STUDY TYPE:** Acute 96-hour Flow-Through Test.
Species Tested: Lepomis macrochirus.

4. **CITATION:** Surprenant, D.C. 1987. Acute Toxicity of Rovral 50 WP to Bluegill (Lepomis macrochirus) Under Flow-Through Conditions. SLS Report #87-12-2578. Prepared by Springborn Life Sciences, Inc., Wareham, Massachusetts. Submitted to Rhone-Poulenc Ag Company, Inc. Research Triangle Park, North Carolina. Accession Number 404892-03.

5. **REVIEWED BY:**

Kimberly D. Rhodes
Aquatic Toxicologist
Hunter Environmental Services, Inc.

Signature: Kimberly D. Rhodes
Date: 6/13/88

6. **APPROVED BY:**

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

Signature: Prapimpan Kosalwat
Date: 6-15-88

Henry T. Craven
Supervisor, EEB/HED
USEPA

Signature:
Date:

7. **CONCLUSIONS:** This study is scientifically sound, but does not fulfill the Guidelines requirements for a warmwater fish because it did not include a control of the inert carrier. The 96-hour LC50 value for Lepomis macrochirus exposed for 96 hours to Rovral 50 WP under flow-through test conditions was 8.6 mg A.I./L. Rovral 50 WP is classified as moderately toxic to Lepomis macrochirus. The NOEC was less than 2.3 mg A.I./L.

8. **RECOMMENDATIONS:** N/A

9. **BACKGROUND:**

10. DISCUSSION OF INDIVIDUAL TESTS: N/A

11. MATERIALS AND METHODS:

A. Test Animals: Lepomis macrochirus were obtained from a commercial fish supplier in Nebraska and maintained for a minimum of 12 days in soft well water (total hardness of 30-32 mg/L as $CaCo_3$) at a temperature of 20 to 22°C. At test termination, the fish ranged from 1.03 to 2.68 g wet weight with an average of 1.5 g wet weight. No mortality was observed during the 48-hour holding period immediately prior to testing. The bluegill selected for testing had an average length of 49 millimeters. Fish were fed a dry commercial pelleted food ad libitum, during holding except for the 48 hours prior to testing.

B. Test System: The exposure system used in this study was a continuous flow serial diluter, similar to that described by Benoit et al. (1982) with a 0.65 dilution factor. The flow rate provided approximately 6.5 volume additions per day. The temperature was maintained by a water bath at 22 ± 1°C.

The dilution water was well water and was characterized as having a total hardness range of 30 - 32 mg/L $CaCO_3$, a total alkalinity range of 30 - 33 mg/L, a pH range of 7.1 - 7.2 and a specific conductance range of 100 - 110 umhos/cm during the study period.

C. Dosage: 96-hour acute flow-through test.

D. Design: Ten bluegill were tested per test aquarium (20 per treatment level). A control and six nominal Rovral 50 WP concentrations of 25, 16, 11, 6.9, 4.5 and 2.9 mg A.I./L were maintained. The mean measured test concentrations were 13, 12, 6.7, 5.3, 4.1 and 2.3 mg/L.

E. Statistics: The computer program developed by Stephan et al. was used to calculate the LC50 values.

12. REPORTED RESULTS: "The mean measured concentrations (day 0 and 4 analyses), the corresponding mortalities and the physical and biological observations made during the definitive test are presented in Table 2" (attached). Mortality ranged from 0 percent in 2.3, 4.1, and 5.3 mg A.I./L to 95 percent in 13 mg A.I./L; control mortality was 0 percent. "The 96-hour LC50 for bluegill exposed to Rovral 50 WP was calculated by probit analysis to be 8.6 mg A.I./L with a 95% confidence interval of 7.7 to 9.7 mg A.I./L."

"All tested solutions of Rovral 50 WP contained undissolved test material in suspension which accumulated on the bottom of each test aquarium".

13. STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES: The 96-hour LC50 for Bluegill (Lepomis macrochirus) exposed to mean measured concentrations of Rovral 50 WP (50% A.I. Iprodione) under flow-through test conditions was 8.6 mg/L with 95 percent confidence limits of 7.7 and 9.7 mg/L.

The data were audited by the laboratory's Quality Assurance Unit to assure compliance with protocols, standard operating procedures and pertinent EPA Good Laboratory Practice (GLP) Regulations. A GLP compliance statement was included and signed by the Quality Assurance Unit.

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 from the SEP as follows:

The SEP states that the temperature should be measured every 6 hours if controlled by a water bath. The temperature was measured every 24 hours for this test.

The SEP recommends that fish be acclimated to study conditions for at least 14 days prior to testing. The fish used in this study were maintained for a minimum of 12 days prior to testing.

An inert carrier control was not performed during the test.

B. Statistical Analysis: The reviewer used the computer program developed by Stephan et al. to calculate the LC50 values. These calculations are attached. The use of the probit method provides the same LC50 and 95 percent confidence limits (8.6 mg/L with limits of 7.7 and 9.7 mg/L). The report did not specify the slope of the toxicity curve as required by the SEP, but the value calculated by Stephan's program was 7.8.

C. Discussion/Results: The 96-hour LC50 value of 8.6 mg/L for Lepomis macrochirus classifies Rovral 50 WP as moderately toxic. The no-observed-effect concentration (NOEC) was determined to be less than 2.3 mg A.I./L. The test was conducted with a total hardness range of 30 - 32 mg/L $CaCO_3$ and a temperature of $22 \pm 1^{o}C$.

D. **Adequacy of the Study**:

(1) **Classification**: Supplemental.

(2) **Rationale**: No inert control was included in the test.

(3) **Repairability**: Provide inert carrier control data.

15. **COMPLETION OF ONE-LINER FOR STUDY**: Yes, 6-13-88.

No. _____ Chemical Name Rovral 50 WP Chemical Class ____ Page 1 of ____

Study/Species/Lab/ Succession	Chemical % a.i	Results	Reviewer/ Date	Validation Status
14-Day Single Dose Oral LD_{50} Species _____ Lab Acc.		LD50 = mg/kg (95% C.L.) Contr. Mort.(%)= Slope= # Animals/Level= Age(Days)= Sex = 14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( ) Comments:		
14-Day Single Dose Oral LD_{50} Species _____ Lab Acc.		LD50 = mg/kg (95% C.L.) Contr. Mort.(%)= Slope= # Animals/Level= Age(Days)= Sex = 14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( ) Comments:		
8-Day Dietary LC_{50} Species Lab _____ Acc.		LC50 = ppm (95% C.L.) Contr. Mort.(%)= Slope= # Animals/Level= Age(Days)= Sex = 8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( ) Comments:		
8-Day Dietary LC_{50} Species Lab _____ Acc.		LC50 = ppm (95% C.L.) Contr. Mort.(%)= Slope= # Animals/Level= Age(Days)= Sex = 8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( ) Comments:		
8-Day Dietary LC_{50} Species Lab _____ Acc		LC50 = pp__ (95% C.L.) Contr. Mort.(%)= Slope= # Animals/Level= Sol. Contr. Mort.(%)= 96-Hour Dose Level ppm /(%Mortality) Temperature = ( ), ( ), ( ), ( ), ( ) Comments:		
96-Hour LC_{50} Species Lepomis macrochirus Lab Springborn Life Sciences, Inc. 50% Acc. 404892-03		LC50 = 8.6 ppm (95% C.L. 7.7 -9.7) Con. Mor(%)=0 Slope= N/A # Animals/Level= 20 Sol. Con. Mor.(%)= N/A 96-Hour Dose Level ppm /(%Mortality) Temp.=22±1° C KDR 6/13/88 2.3 (0), 4.1 (0), 5.3 (0), 6.7 (30), 12 (80) 13 (95) Comments: Mean measured concentrations of Iprodione reported		Supp
96-Hour LC_{50} Species Lab _____ Acc.		LC50 = pp__ (95% C.L.) Con. Mort.(%)= Slope= # Animals/Level= Sol. Con. Mort.(%)= 96-Hour Dose Level pp__ /(%Mortality) Temp.= ( ), ( ), ( ), ( ), ( ) Comments:		

Table 2. Concentrations tested and corresponding mortalities of bluegill (Lepomis macrochirus) exposed to Rovral 50 WP during a 96-hour flow-through toxicity test. Measured concentrations are expressed based on the concentration of active ingredient Iprodione).

Mean Measured Concentration (mg A.I./L)	Cumulative Mortality (%)											
	24-hour			48-hour			72-hour			96-hour		
	A	B	Mean	A	B	Mean	A	B	Mean	A	B	Mean
13[a]	40	90	65[cd]	90	100	95[c]	90	100	95[c]	90	100	95[c]
12[a]	30	40	35[cd]	40	70	55[cf]	60	80	70[c]	70	90	80[c]
6.7	0	0	0[befgh]	10	20	15[befghi]	20	20	20[befgh]	40	20	30[befgh]
5.3	0	0	0[efgh]	0	0	0[befgh]	0	0	0[befghi]	0	0	0[befhi]
4.1	0	0	0[efg]	0	0	0[befgh]	0	0	0[befghi]	0	0	0[befh]
2.3	0	0	0[dh]	0	0	0[bdh]	0	0	0[bdh]	0	0	0[bdj]
Control	0	0	0	0	0	0	0	0	0	0	0	0

[a] The test solutions were cloudy and undissolved material was present at 0 hour and throughout the study period.
[b] Undissolved test material was present on the bottom of the test solutions.
[c] All fish exhibited complete loss of equilibrium.
[d] All fish were lethargic.
[e] Several fish exhibited a complete loss of equilibrium.
[f] Several fish were lethargic.
[g] Several fish were at the surface of the test solution.
[h] Several fish exhibited a darkened pigmentation.
[i] Several fish exhibited a partial loss of equilibrium.
[j] All fish exhibited a darkened pigmentation.

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
13	20	19	95	2.002716E-03
12	20	16	80	.5908966
6.7	20	6	30	5.765915
5.3	20	0	0	9.536743E-05
4.1	20	0	0	9.536743E-05
2.3	20	0	0	9.536743E-05

THE BINOMIAL TEST SHOWS THAT 5.3 AND 12 CAN BE
USED AS STATISCALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS 99.40901 PERCENT.
AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 8.415013

>>>>>>>>RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
5	.0348107	7.829925	6.979135	8.957171

>>>>>>>RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
6	8.167934E-02	1	.4529454

SLOPE = 7.840143
95 PERCENT CONFIDENCE LIMITS = 5.599462 AND 10.08082

LC50 = 8.633572
95 PERCENT CONFIDENCE LIMITS = 7.726101 AND 9.657526
LC1 = 4.359246
95 PERCENT CONFIDENCE LIMITS = 3.233177 AND 5.210088