081901

3.11.80 Bluegill

DATA EVALUATION SHEET

1. CHEMICAL: Bravo 500

2. FORMULATION: Chlorothalonil

3. CITATION

Buccafusco, Robert, 1979. Chlorothalonil acute Toxicity Study in Bluegill. An unpublished report prepared by EG & G Bionomics for Diamond Shamrock Corporation. (Accession Number 099247)

4. REVIEWED BY: Daniel Rieder
Wildlife Biologist
EEB/HED

5. DATE REVIEWED: March 11, 1980

6. TEST TYPE: 96-hour Acute Toxicity

A. Test Species: Bluegill (Lepomis macrochirus)

B. Test Material: Chlorothalonil (Technical, 96%)

7. REPORTED RESULTS

The reported 96-hour LC_{50} for bluegill exposed to technical chlorothalonil is 62 ppb with 95% confidence limits of 52 - 78 ppb.

8. REVIEWERS CONCLUSION

A. Validation Category: Supplemental

B. Discussion

This study was conducted scientifically but does not fulfill the requirements for an acute toxicity test on fish. It does demonstrate that chlorothalonil could be very highly toxic to bluegill.

METHODS/RESULTS

A. Test Procedures

Referenced testing procedure was "Methods for Acute Toxicity Tests with Fish, Macroinvertebrates, and Amphibians (U.S. EPA, 1975) and a protocol the testing laboratory received from the registrant. The procedure as described essentially followed the EPA proposed guidelines (July 10, 1978) for a static toxicity test. The DO was measured in the controls, and in the low, middle, and high test concentration. The fish were held for 14 days, but food was withheld only 48 hours prior to testing. Concentrations were nominal. Ten fish were tested per container.

B. Statistical Analysis

The reported 96-hour LC_{50} for bluegill exposed to chlorothalonil, as estimated by the moving average angle, was 60 ppb. No 95% confidence limits were reported.

C. Results

The 96-hour LC_{50} was 60 ppb. No deaths occurred in the control or in the test concentrations up to 10 ppb. However, one fish died in the solvent control. There was no 100% mortality, even at the highest concentration level (77 ppb). Partial mortality occurred at two concentration levels. DO dropped to 6.8%, 9.1%, and 16% in the 77, 17, and 3.6 ppm concentration levels respectively.

REVIEWERS EVALUATION

A. Test Procedure

The established protocols for acute toxicity tests in fish require that the fish be held without food for 96 hours before testing. It also indicates that DO be measured at the end of 48 and 96 hours. While the DO ws measured at these times, it was not measured in all concentrations. Therefore, it is assumed that the DO was low in all test containers. The low DO is unacceptable as it could have caused the deaths which occurred in the higher concentrations.

B. Statistical Analysis

The data provided with the report was used to generate an LC_{50} with Stephans computer analysis; the results are attached to the original review on file. The LC_{50} generated by the Branch terminal computer is essentially the same as the reported LC_{50}.

C. Discussion

The pesticide chlorothalonil is apparently very highly toxic to bluegill with an estimated LC_{50} of 60 ppb. However, the low DO in the test containers may have affected the results.

D. Conclusions

1. Category: Supplemental

2. Rationale

This study is not acceptable for the following reasons:

a. The DO content was too low in the test containers.

b. The DO was only measured in the controls and the high, medium and low concentration levels.

c. The fish were held without food only 48 hours prior to testing.

3. Repairability: N/A

CHLOROTHALONIL
BLUEGILL
Daniel Rieder
3/11/80

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
77	10	9	90.	1.07422
46	10	1	10.	1.07422
28	10	0	0	9.76563E-2
17	10	0	0	9.76563E-2
10	10	0	0	9.76563E-2

THE BINOMIAL TEST SHOWS THAT 46 AND 77 CAN BE
USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 59.5147

--------RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
2	.167754	59.5147	49.6234	79.0387

--------RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
7	.335691	1	.999993

SLOPE = 11.4693
95 PERCENT CONFIDENCE LIMITS = 4.82411 AND 18.1144

LC50 = 59.5207
95 PERCENT CONFIDENCE LIMITS = 49.5302 AND 71.6339
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