

US EPA ARCHIVE DOCUMENT

9-13-90

DATA EVALUATION REPORT
ECOLOGICAL EFFECTS BRANCH

- 1. Chemical: Bromacil
- 2. Test Material: Bromacil, technical
 - Active Ingredient: 2,4(1H, 3H)-Pyrimidinedione 5-bromo-6-methyl-3-(1-methylpropyl).....95%
 - Inert ingredients.....5%

3. Study Type: Static Acute LC₅₀ Test using bluegill sunfish.

4. Study Identification:

Study Author: Wetzel, James
 Study Laboratory: Haskell Laboratory for Toxicology and Industrial Medicine, duPont de Nemours and Co., Newark, DE.
 Study Dates: January 19-23, 1986
 Study Identification: MR - 7708
 Sponsor: E. I. duPont de Nemours and Co.
 EPA Identification: MRID 409515-02

5. Reviewed By: Brian Montague, Fisheries Biologist *Brian Montague*
 Ecological Effects Branch *9/12/90*
 Environmental Fate & Effects Division (H7507C)

6. Approved By: Ray Matheny, Supervisory Biologist *Ray Matheny* *9/13/90*
 Ecological Effects Branch
 Environmental Fate & Effects Division (H7507C)

7. Conclusions: The study has fulfilled requirements for acute toxicity testing of a warmwater fish. The LC₅₀ value of 127 ppm is supported by the test results. The NOEL would be 71 ppm based on the occurrence of effects at 95 ppm.

8. Recommendations: N/A

9. **Submission Purpose:** To satisfy reregistration guideline requirements.

10. **Study Methods and Protocol:** The study report has not specified any guidance document used in the protocol design, however a quality assurance statement concerning their adherence to good laboratory practices accompanies the report.

Test Organisms: Bluegill Sunfish, Lepomis macrochirus were obtained from SP Engineering, Inc. in Salem, Mass. Only control fish were measured and length (2.0 - 2.4 cm) and weight (0.199 - 0.385 gm) were stated to be representative of fish used at all test levels. The fish were acclimated 13 days prior to test initiation and feed was withheld 48 hours prior to exposure.

Test Solution and Dilution Water: Aged well water with a pH of 7.4, dissolved oxygen (initially) of 8.7, alkalinity of 85 mg/L as CaCO₃, hardness of 78 mg/L as CaCO₃, and a conductivity of 171 micro ohms/cm was used as the dilution water.

Test solutions were prepared from a 0.3 gm/L stock solution in nominal concentration levels of 300, 225, 169, 127, 95, 71, 53, 40, and 40 mg/L. Unaltered dilution water was used for controls.

Test Materials and Procedures: 18 liter glass aquaria were employed. Volumes of 15 liters of test solution were added to each aquarium. Test solutions were not aerated. Photoperiod was maintained at 16D/8N. Temperature ranged from 21.1-22°C. Dissolved oxygen and pH were measured every 24 hours in control, low, medium, and high concentration test aquaria (except for those in which total mortality occurred). Alkalinity, hardness, and conductivity were measured in the control vessel only.

11. **Reported Test Results:** Water quality parameters appeared to remain constant in the 4 test aquariums in which measurements were taken. Temperature remained at 21-27°C, pH was stable at 7.4 - 7.5, and dissolved oxygen remained between 8.8 and 6.5.

Twenty four hour mortality was 100% and 20% at 300 and 225 ppm, respectively. Forty eight hour mortality ranged from 50% at 127 ppm to 100% at 300 ppm. Seventy two hour mortality was 50% at 127 ppm, 90% at 169 ppm, and 100% at 225 and 300 ppm. By 96 hours mortality was also 100% at 169 ppm with 50% survival at 127 pm. Partial loss of equilibrium was observed at 95 mg/L and above, however no mortality occurred at this lower dosage.

12. **Study Author's Conclusions:** Test results for bluegill sunfish exposed to bromacil (H-16,177) are presented in Table I. The 96-hour LC₅₀ was 127 mg/L (scale-of-dose transformed to Log 10), with no 95% confidence interval derived."

13. **Reviewer's Discussion:** Test procedures and water quality parameters appeared acceptable, though parameters were only reported for 4 out of 10 test vessels. Weight of the fish was below 0.5 to 5 gm weight range suggested by EPA Standard Evaluation Procedures for warmwater fish toxicity testing.

The procedures state that "very young (not actively feeding), sexually mature, spawning, or recently spent fish should not be utilized. No indication is provided of the method of temperature control, or whether any one test vessel received continuous temperature monitoring. Though no actual concentration measurements were performed, Bromacil degradation studies with aqueous sediments have indicated a long half-life (8-12 weeks), and it is felt by this reviewer that concentrations would have remained relatively constant during the 96 hour period. The reporting of water quality parameters, the numbers of test fish, and the number of test vessels per concentration were nominal, but acceptable.

Summary of Study

Classification: Core

Rationale: The study has fulfilled acceptable guideline requirements for warmwater fish acute toxicity testing under static conditions.

Comparability: N/A

Montague Bromacil Acute Tox Bluegill static

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
300	10	10	100	9.765625E-02
225	10	10	100	9.765625E-02
169	10	10	100	9.765625E-02
127	10	5	50	62.30469
95	10	0	0	9.765625E-02
71	10	0	0	9.765625E-02
53	10	0	0	9.765625E-02
40	10	0	0	9.765625E-02
30	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 95 AND 169 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 127

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.
