028201

11-21-70

FISH TOXICITY LABORATORY REPORT

Animal Biology Laboratory
ARS-PR, ARC, Beltsville, Md.

Test Number: 309

I.D. Number: 79937
USDA Reg. No.: 524-123

Product: **Rogue Selective Herbicide for Rice**

Manufacturer: **Monsanto Company**
St. Louis, Missouri

Active Ingredients: **3,4-Dichloropropionanilide** 45%

Date Product Received: **September 18, 1970**

Period of Test: **November 10, 1970 - November 12, 1970 & November 17 - 21, 1970.**

Biologist Conducting Test: **John McCann**

Test Species: **Bluegill Lepomis macrochirus**

Condition: **Excellent**

Average length: 36.0 mm.
Average weight: 0.652 gm.

Source: **Harrison Lake National Fish Hatchery**

Date received: **October 28, 1970**

Acclimation temperature: 65 °F

Bioassay Conditions:

Test vessel: 5-gallon glass jar. Water volume: 15 l.
Fish/vessel: 10 Fish/concentration: 20 Concentrations tested: 5

Water Quality:

Test Water: Demineralized water 1,000,000 ohms resistivity reconstituted to U. S. Fish and Wildlife Service Standards.

Temperature: 65 °F
Alkalinity: 41.04 ppm.
Calcium hardness: 17.1 ppm.
Dissolved CO_2: < 10 ppm.

pH: 7.9
Total hardness: 51.3 ppm.
Dissolved O_2: 6.0 ppm.

Purpose:

To determine the toxicity of Rogue Selective Herbicide containing 45% 3,4-Dichloropropionanilide to bluegill at a water temperature of 65° F.

Fish Pretest History:

Upon arrival at the Laboratory, the fish were placed in a plastic swimming pool of approximately 570 gallons capacity. Water in the pool was maintained at a temperature suitable for the species of fish and aerated continuously. The water was recirculated through a sand filter approximately once per hour.

The fish were fed commercial trout chow while at the Laboratory. They were not treated with a prophylactic chemical at anytime.

No tests were made on these fish until they had undergone a minimum 10-day-observation period.

Acclimation:

Three days prior to testing, fish from 35 to 75 mm. in length were sorted from the stock tank and placed in acclimation tanks containing the quality and temperature of water to be used during the test. The fish were not fed after being taken from the stock pool.

Test Procedure:

The handling of the fish and the organization of the tests followed procedures described in Doudoroff (1951), Lennon (1964) and the Fish Pesticide Acute Toxicity Test Method as developed by the Animal Biology Staff, Pesticides Regulation Division, ARS in August 1966. Test results were analyzed and the LC 50 concentrations were computed by use of the Litchfield and Wilcoxon (1949) method.

The bio-assay tests were made in 5-gallon-glass jars containing 15 liters of reconstituted water. Fish were placed in each jar one day before the test chemicals were added. Twenty fish were tested at each concentration. The stock solutions* of chemicals were mixed within 1 hour of the start of the test. The aliquot of chemical necessary to obtain the desired concentration of toxicant was added to the test jars and immediately stirred into the water to ensure an even distribution. All toxicity levels presented in this paper are based on the amount of active ingredients** present in the test solutions unless indicated otherwise.

The reaction of the fish to the toxicant was recorded at elapsed times of 3/4, 1 1/2, 3, 6, 12 and 24 hours. Readings were taken at 24-hour intervals after the first day of the test period. Observations made at non-scheduled intervals were also recorded.

* 15 ml. of I.D. in 85 ml. of water.

** Total formulation.

Test Results:

The analysis of the test results are presented on probit analysis sheets in the appendix. The table below summarizes some of the important information from these sheets.

The lowest limit in the 95-percent confidence interval for LC 10 and the highest limit in the 95-percent confidence interval for LC 90 at various time intervals was used to indicate the range in concentrations of the active ingredient that could be expected to kill from 10-90 percent of the fish 95 percent of the time.

Concentration of Rogue Selective Herbicide in ppm. expected by computation to kill from 10 to 90 percent of the bluegill at a temperature of 65° F.

Test Period	Initial Mortality Maybe Expected	Total Mortality Maybe Expected	LC 50
Test #1			
24 - 48 hr.	12.9	26.8	18.5
Test #2			
24 hr.	10.8	28.1	17.5
48 hr.	10.9	23.4	16.0
96 hr. Data too variable to permit analysis.			

Conclusions:

Rogue Selective Herbicide containing 45% 3,4-Dichloropropionanilide can be expected to kill bluegills at a concentration of 10.8 ppm. in 24 hours. The 24-hour LC 50 is 17.5 ppm.

Test conducted by,

John A. McCann
Biologist

Test approved by,

John A. Ludeman
Laboratory Supervisor