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DEPARTMENT
GOVERNMENT REGISTRATION CONTRACT RESEARCH REPORT

TITLE
Acute Toxicity of FUMAZONE® F to Bluegill (*Lepomis macrochirus*)
and Rainbow Trout (*Salmo gairdneri*)

7
PAGES
IN FULL
REPORT

NON-DOW CONTRACTOR
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This report is: ☐ INTERIM and mainly: ☒ NEW
☒ FINAL ☐ REVIEW

DESCRIPTIVE SUMMARY
WITH CONCLUSIONS:

(Include in this space references to data books, and to earlier related reports, patents and publications.)

The 96-hour static water LC50's for fish using FUMAZONE® F were found to be as follows:

Species	LC50 mg/l (95% confidence limits)
Rainbow Trout	43.7 (33.2-57.5)
Bluegill	46.0 (37.6-56.2)

These tests meet the protocol specifications of the U.S. Environmental Protection Agency.

The label for FUMAZONE® F (= 100% - 1,2-dibromo-3-chloropropane (DBCP)) under present EPA regulations would not require a statement "Toxic to fish" by use of this data.

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ACUTE TOXICITY OF FUMAZONE[®] F TO BLUEGILL
(Lepomis macrochirus) AND RAINBOW TROUT
(Salmo gairdneri).

BIOASSAY REPORT
SUBMITTED TO
DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

Bionomics, E G & G
790 Main Street
Wareham, Massachusetts
March, 1975

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conditions described below. The bluegill used in these tests, obtained from a commercial fish hatchery in Connecticut, had a mean weight of 1.0 g and a mean length of 35 mm. The rainbow trout were acquired from a commercial trout producer in Massachusetts, and had a mean weight and length of 1.1 g and 54 mm, respectively.

The test organisms were held in 1700 l concrete raceways which were coated with an epoxy resin paint to prevent leaching of materials into the water. Flow of well water (having a temperature of $21^{\circ}\text{C} \pm 1.0$ for the bluegill, and $14^{\circ}\text{C} \pm 1.0$ for the rainbow trout, hardness as CaCO_3 of 35 mg/l and a pH of 7.1) into these raceways was at least 4 l/minute, which provided an adequate rate of turnover for holding these species. The test animals were held in the laboratory hatchery facilities for at least thirty days prior to testing. During the thirty day holding period, mortality was <2%; no mortality was observed during the 48 hours immediately prior to testing, and these fish were judged to be in excellent condition.

Static fish bioassays were conducted in 19.6 liter glass vessels kept in water baths at $21^{\circ}\text{C} (\pm 1.0)$ for the

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bluegill, and at 12°C (± 1.0) for the rainbow trout. Each species was from the same year class, and the standard length of the longest fish was no more than two times that of the shortest fish. The fish were acclimated over a 48-hour period prior to testing to test conditions of temperature and water quality. The test organisms were not fed during this period. Fish were introduced to the test vessel within 30 minutes after the compound was added. Ten fish were exposed to each concentration. The vessels were not aerated, and the test compound was added to each jar in a solution of acetone. A solvent control, which contained the greatest amount of acetone introduced into any test vessel, was conducted.

Two series of concentrations were established within the bioassay, a series of range-finding concentrations, and a series of definitive concentrations. The preliminary test was conducted to determine approximate range of concentrations for evaluating the dose-response relationship. The definitive test, consisting of at least five concentrations, evaluated the dose-response relationship to a degree allowing the LC50 to be calculated from the data with optimum accuracy. A control, which consisted

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of the same dilution water, conditions, procedures, and organisms, was conducted for each species tested.

The standard diluent used in the test system had a pH of 7.1, and a total hardness (EDTA) of 35 ppm as CaCO_3 . Dissolved oxygen values for the various test vessels ranged from 8.9 initially to 4.2 mg/l at the end of the tests.

RESULTS

The predicted LC50 values and 95% confidence intervals are presented in Table 1. The highest concentration at which there was no discernible effect during the 96-hour bioassay was 32.0 mg/l for the bluegill and 24.0 mg/l for the rainbow trout. Table 2 presents a summary of observed mortality for each individual test vessel after 24, 48, and 96 hour exposures. The mortality syndrome among fish from those concentrations where mortality was observed was similar. Fish generally became dark and lethargic, lost equilibrium, and expired.

SUBMITTED BY:

Bionomics, E G & G
790 Main Street
Wareham, Massachusetts
March, 1975

PREPARED BY:

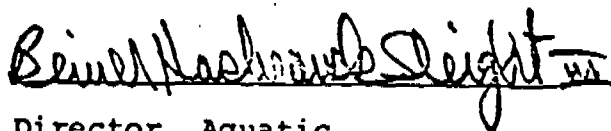
Robert E. Bentley

A handwritten signature in cursive script, reading "Robert E. Bentley", written over a horizontal line.

Chief, Acute Toxicity &
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APPROVED BY:

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Director, Aquatic
Toxicology Laboratory

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Table 1 -- Acute toxicity of Fumazone[®] F to bluegill^a (Lepomis macrochirus) and rainbow trout^b (Salmo gairdneri).

These data are based on results of bioassays conducted at the aquatic toxicology laboratory of Bionomics, E G & G, Wareham, Massachusetts.

Species	LC50-milligrams active ingredient/liter			No discernible effect level (mg/l)
	24 hour	48 hour	96 hour	
bluegill	63.5 (52.4-76.9) ^c	56.4 (41.4-76.9)	46.0 (37.6-56.2)	32.0
rainbow trout	64.0 (52.4-78.2)	51.8 (40.1-66.9)	43.7 (33.2-57.5)	24.0

^a Bioassays conducted at 21°C ($\pm$ 1.0), mean weight of bluegill 1.0 g.

^b Bioassays conducted at 12°C ($\pm$ 1.0), mean weight of rainbow trout 1.1 g.

^c 95% confidence interval.

Table 2 -- Concentrations tested and corresponding observed percent mortalities for bluegill (Lepomis macrochirus) and rainbow trout (Salmo gairdneri) exposed to Fumazone^(A) F for 24, 48, and 96 hours.

Species	Concentration (mg/l)	% mortality observed		
		24 hour	48 hour	96 hour
bluegill	100.0	100	100	100
	75.0	80	100	100
	56.0	20	20	80
	42.0	0	0	60
	32.0	0	0	0
	control	0	0	0
	control (acetone)	0	0	0
rainbow trout	100.0	100	100	100
	75.0	60	70	90
	56.0	30	40	80
	42.0	0	40	90
	24.0	0	0	0
	control	0	0	0
	control (acetone)	0	0	0