DATA EVALUATION RECORD
§ 72-1(C) -- ACUTE LC_{50} TEST WITH A COLDWATER FISH

1. **CHEMICAL:** Glyphosate PC Code No.:

2. **TEST MATERIAL:** Glyphosate Purity: 95.6%

3. **CITATION**

Authors: Kent, S.J.,Morris, D.S., Caunter, J.E. and Comish, S.K.
Title: Acute Toxicity To Rainbow Trout
Study Completion Date: September 15, 1995
Laboratory: Brixham Environmental Laboratory
Sponsor: Zeneca Ag Products
Laboratory Report ID: BL552/B
MRID No.: 443206-29
DP Barcode: 249306

4. **REVIEWED BY:** Curtis E. Laird, Fishery Biologist, EHB, EFED

Signature: Curtis E. Laird **Date:** 2-17-99

5. **APPROVED BY:** Tom A. Bailey, Chief, EHB, EFED

Signature: Tom A. Bailey **Date:** 2-17-99

6. **STUDY PARAMETERS**

Scientific Name of Test Organism: *Oncorhynchus mykiss*
Age or Size of Test Organism: 1.6 - 4.56g; L = 40 mm
Definitive Test Duration: 96-hours
Study Method: static
Type of Concentrations: Nominal

7. **CONCLUSIONS:** This study indicates glyphosate is practically nontoxic to rainbow trout with an LC50 of 134. This study does fulfill the guideline requirements in support of registration for a warmwater fish study.

Results Synopsis
LC_{50}: 134 ppm ai 95% C.I.: 100 - 180 ppm ai
NOEL: ppm ai Probit Slope: N/A

8. **ADEQUACY OF THE STUDY**

A. Classification: Core

B. Rationale: N/A

C. Repairability: N/A

DP Barcode: D: 249306 MRID No.: 443206-29

9. **GUIDELINE DEVIATIONS**

1.

2.

10. **SUBMISSION PURPOSE:** This study is submitted in support of registration.

11. **MATERIALS AND METHODS**

A. Test Organisms

Guideline Criteria	Reported Information
Species Preferred species is the rainbow trout (*Oncorhynchus mykiss*)	Yes
Mean Weight 0.5-5 g	1.6 - 4.56g (mean is 2.68g)
Mean Standard Length Longest not > 2x shortest	Mean: 47 mm Range:
Supplier	Zeals Trout farm, Wolverton, Near Warminster, Wiltshire, UK
All fish from same source?	Not reported
All fish from the same year class?	Not reported

B. Source/Acclimation

Guideline Criteria	Reported Information
Acclimation Period Minimum 14 days	32 days
Wild caught organisms were quarantined for 7 days?	No
Were there signs of disease or injury?	No

Guideline Criteria	Reported Information
If treated for disease, was there no sign of the disease remaining during the 48 hours prior to testing?	No
Feeding No feeding during the study	Feeding stopped 48 hours prior to test iniation
Pretest Mortality < 3% mortality 48 hours prior to testing	0% mortality prior to testing.

C. **Test System**

Guideline Criteria	Reported Information
Source of dilution water Soft reconstituted water or water from a natural source, **not** dechlorinated tap water	dechlorinated tap water
Does water support test animals without observable signs of stress?	Yes
Water Temperature 12°C	12°C
pH Prefer 7.2 to 7.6	5.11 to 7.0
Dissolved Oxygen Static: ≥ 60% during 1st 48 hrs and ≥ 40% during 2nd 48 hrs, flow-through: ≥ 60%	6.1 to 6.8%
Total Hardness Prefer 40 to 48 mg/L as $CaCO_3$	56.3 mg/l is above the ranged of 40 to 48
Test Aquaria 1. Material: Glass or stainless steel 2. Size: Volume of 18.9 L (5 gal) or 30 x 60 x 30 cm 3. Fill volume: 15-30 L of solution	40 L glass aquaria with 30 L of test solution

Guideline Criteria	Reported Information
Type of Dilution System Must provide reproducible supply of toxicant	N/A
Flow Rate Consistent flow rate of 5-10 vol/24 hours, meter systems calibrated before study and checked twice daily during test period	N/A
Biomass Loading Rate Static: ≤ 0.8 g/L at ≤ 17°C, ≤ 0.5 g/L at > 17°C; flow-through: ≤ 1 g/L/day	0.7g/L
Photoperiod 16 hours light, 8 hours dark	16 light/8 hours of darkiness
Solvents Not to exceed 0.5 ml/L for static tests or 0.1 ml/L for flow-through tests	Solvent:N/A Maximum conc.: ml/L.

D. Test Design

Guideline Criteria	Reported Information
Range Finding Test If LC_{50} >100 mg/L with 30 fish, then no definitive test is required.	Not mentioned
Nominal Concentrations of Definitive Test Control & 5 treatment levels; dosage should be 60% of the next highest concentration; concentrations should be in a geometric series	32, 56, 100, 180, 320, and 560 mg ai/L.
Number of Test Organisms Minimum 10/level, may be divided among containers	10/level
Test organisms randomly or impartially assigned to test vessels?	Yes

Guideline Criteria	Reported Information
Biological observations made every 24 hours?	Yes
Water Parameter Measurements 1. Temperature Measured constantly or, if water baths are used, every 6 hrs, may not vary > 1°C 2. DO and pH Measured at beginning of test and ever 48 h in the high, medium, and low doses and in the control	Yes, daily
Chemical Analysis Needed if solutions were aerated, if chemical was volatile, insoluble, or known to absorb, if precipitate formed, if containers were not steel or glass, or if flow-through system was used	No aeration

12. **REPORTED RESULTS**

A. General Results

Guideline Criteria	Reported Information
Quality assurance and GLP compliance statements were included in the report?	Yes
Recovery of Chemical	91 to 100%
Control Mortality Not more than 10% control organisms may die or show abnormal behavior.	0%
Raw data included?	Yes
Signs of toxicity (if any) were described?	Yes, dark decoloration

Mortality

Concentration (ppm)		Number of Fish	Cumulative Number Dead			
			Hour of Study			
Nominal	Mean Measured		24	48	72	96
Control	N/A	0	0	0	0	0
32	29	10	0	0	0	0
56	29	10	0	0	0	0
100	54	10	0	0	0	0
180	93	10	10	10	10	10
320	no sample due 100% mortality	10	10	10	10	10
560	no sample1 due 100% mortality	10	10	10	10	10

Other Significant Results: N/A

B. Statistical Results

Method: Binomial

96-hr LC_{50}: 134 ppm ai 95% C.I.: 100-180 ppm ai

Probit Slope: N/A NOEC: 32 ppm ai

13. VERIFICATION OF STATISTICAL RESULTS

Parameter	Result
Binomial Test LC_{50} (C.I.)	134(100-180) ppm ai
Moving Average Angle LC_{50} (95% C.I.)	N/A (____-____) ppm ai
Probit LC_{50} (95% C.I.)	N/A (____-____) ppm ai
Probit Slope	N/A
NOEC	32 ppm ai

14. REVIEWER'S COMMENTS: This study does fulfill the guideline requirements in support of registration for a coldwater fish

study. The 96-hour LC50 is 134 ppm and the NOEC is 32 ppm.

C Laird Glyphosate 96-Hour LC50 For Rainbow Trout 443206-29

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
560	10	10	100	9.765625E-02
320	10	10	100	9.765625E-02
180	10	10	100	9.765625E-02
100	10	0	0	9.765625E-02
56	10	0	0	9.765625E-02
32	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 100 AND 180 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 134.1641

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.

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