DATA EVALUATION RECORD

1. Chemical: Glyphosate, S# 103601

2. Test Material: Roundup 41.36% ai

3. Study Type: Acute Fish 96-hour LC_{50}--Bluegill Sunfish

4. Study ID: LeBlanc, G.A.; Surprenant, D.C.; Sleight, B.H., III (1980) Acute Toxicity of Roundup to Bluegill (Lepomis macrochirus): Report #BW-80-4-634; Monsanto Study No. BN-80-075. (Unpublished study received April 2, 1981, under 524-308; prepared by EG & G, Bionomics, submitted by Monsanto Co., Washington, DC; CDL:244749-F)

5. Reviewed by: Dennis J. McLane, Wildlife Biologist, EEB/HED — Signature: Dennis J. McLane — Date: 8-28-85

6. Approved by: Raymond W. Matheny, Section Head, EEB/HED — Signature: Raymond W. Matheny — Date: 8-30-85

7. Conclusions:

This study can be used for hazard assessment purposes. It also meets the guideline requirements for formulation testing. Using the toxicity categories of Brooks et al. (1973) the acute LC_{50} of 148.7 (-24) mg/l would place Roundup 41.36% ai into the moderately toxic category.

8. Recommendations:

N/A

9. Background:

This study was submitted on March 30, 1981, and reviewed July 10, 1981, by EEB. This validation is the result of the Glyphosate Registration Standard.

10. Discussion of Individual Test:

N/A

11. Materials and Methods:

A. Test animals were bluegill, Lepomis macrochirus from a commercial fish supplier in Nebraska; mean weight = 0.45 grams; mean length = 34 millimeters; no age given.

B. Dose: Static bioassay using nominal concentrations.

C. Design: 10 fish per level; 6 dose levels plus control (0, 8.7, 14, 24, 41, 68, and 110 ppm).

D. Statistics: Stephan, et al (1978). Computer program for calculating LC_{50}; "binomial" method used for this data set.

12. Reported Results:

The 96-hour LC_{50} for bluegill exposed to Roundup, estimated binomial probability was 14 mg/l.

13. Study Author's Conclusions/Q.A. Measures:

The author made no conclusions other than those mentioned under Reported Results. Concerning quality assurance, under Materials and Methods of the study the authors stated:

> Unless otherwise stated, procedures used in this acute toxicity test followed those described in "Methods for Acute Toxicity Tests with Fish, Macro Invertebrates, and Amphibians" (U.S. EPA, 1975) and the "EG & G, Bionomics Protocol for Freshwater Static Acute Toxicity Test with Fish" (1979).

Also the signature block for the study indicates the data was audited by Robert E. Bentley, Director, Quality Assurance Unit.

14. Reviewer's Discussion and Interpretation of the Study:

A. Test procedures:

This study will not meet the guideline requirements for testing of technical glyphosate. However, it may be used to meet the typical end-use product requirement for the product Roundup with 41.36 percent active ingredient.

B. Statistical Analysis:

The EEB computer program verified the results reported by the author. The binomial method was correct and produced the same value of 14 mg/l.

C. Discussion/Results:

The study is adequate for formulation testing of glyphosate typical end-use product.

D. Adequacy of Study:

1) Classification: Core

2) Rationale: Due to the toxicity of the surfactant, formulation testing of Roundup was required.

3) Repairability: N/A

15. Completion of One-Liner for Study:

Completed

16. CBI Appendix:

N/A

Data Evaluation

1. Chemical: Roundup (41.36 % a.i.)
2. Citation: Surprenant; Donald, "Acute Toxicity of Roundup to Bluegill Sunfish (Lepomis macrochirus) "prepared by E.G & G, Bionomics Aquatic Toxicology Laboratory, Wareham, Massachusetts, for Monsanto, St. Louis, Mo., Reg. No. 524-308, Submission 3/30/81.

3. Reviewed by: Miachel Rexrode
   Fishery Biologist
   Ecological Effects Branch, HED

4. Date Reviewed: July 10, 1981

5. Test Type: Acute Aquatic 96-hour LC_{50}

   A) Test Species: Bluegill Sunfish (Lepomis macrochirus)

   B) Test Material: Roundup (41.36% a.i.)

   C) Report Result: The 96-hour LC_{50} for bluegill sunfish exposed to Roundup was 14 mg/l.

6. Reviewers Conclusions: Data derived from this study appear to be scientifically sound and satisfy the regulatory requirement as stated in the EPA guidelines, 1978, for a formulation. The calculated 96-hour LC_{50} of 14 mg/l suggests that Roundup formulation is slightly toxic to bluegill sunfish. The no discernable effect level through 96-hours was 8.7 mg/l.

7. Methods and Materials:

   A) Dilution water used was soft water reconstituted from deionized water. This water had a total hardness and alkalinity as $CaCO_3$ of 40 mg/l and an 28 mg/l, respectively; a pH of 7.4; temperature of 22±1°C and a specific conductance of 120 umhos/cm. Ten bluegill sunfish with a mean wet weight and total length of 0.45 grams and 34 millimeters were impartially distributed to each 19.6 l test jar.

   B) Statistical Analysis: Binomial Probability

8. Discussion: This study appears to follow EPA Guideline requiremnts for an acute aquatic LC_{50} test. The test material produced the following percentage mortality for the 96-hour testing: 0% mortality at the 8.7 mg/l level; 50% mortality at the 14 mg/l level; and 100% mortality at the 24, 41, 68, 110 mg/l levels. The no discernible effect concentration through 96-hours was 8.7 mg/l.

Validation: Core

MCLANE ROUNDUP-GLYPHOSATE BLUEGILL LC50 00070897

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
24	10	10	100	.0976563
14	10	5	50	62.3047
8.7	10	0	0	.0976563

THE BINOMIAL TEST SHOWS THAT 8.7 AND 24 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 14

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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