

DATA EVALUATION RECORD

- 1. **CHEMICAL:** Isoxaben.
Shaughnessey No. 125851.
- 2. **TEST MATERIAL:** Isoxaben technical; Lot No. 553-42C-084;
Lilly Serial No. 121607.
- 3. **STUDY TYPE:** Non-Target Plants: Seedling Emergence
Phytotoxicity Test - Tier 2 and Vegetative Vigor
Phytotoxicity Test - Tier 1. Species Tested: Corn, Large
Crabgrass, Redroot Pigweed, Foxtail Millet, Velvetleaf,
Morningglory, and Zinnia for both tests and additionally
Cotton, Soybean, Wheat, Alfalfa, Sugarbeet, Rice, Cucumber,
Tomato, Barnyardgrass, Lambsquarter, Mustard, Wild Oat, and
Jimsonweed for the emergence test.
- 4. **CITATION:** Waldrep, T.W. 1979. Preemergence and
Postemergence Herbicidal Activity of Isoxaben. Laboratory
Project ID. No. P1-447. Conducted by Lilly Research
Laboratories, Greenfield, IN. Submitted by Elanco Products
Co. EPA MRID No. 408320-01.

5. **REVIEWED BY:**

Mark A. Mossler, M.S.
Agronomist
KBN Engineering and
Applied Sciences, Inc.

Signature: *Mark Mossler*
Date: 2/7/92
Charles Lee 9/1/92

6. **APPROVED BY:**

Michael L. Whitten, M.S.
Staff Scientist
KBN Engineering and
Applied Sciences, Inc.

Signature: *Michael L. Whitten*
Date: 2/7/92

Henry T. Craven, M.S.
Supervisor, EEB/EFED
USEPA

Signature: *Henry T. Craven*
Date: 9/1/92

- 7. **CONCLUSIONS:** This study is not scientifically sound and
does not meet the guideline requirements for a Tier 2
seedling emergence or a Tier 1 vegetative vigor non-target
plant phytotoxicity test. Improper design (i.e., multiple
plants per tray, lack of controls and replicates) precluded
valid results from being drawn from the study.

7 hrs

8. RECOMMENDATIONS: N/A.

9. BACKGROUND:

10. DISCUSSION OF INDIVIDUAL TESTS: N/A.

11. MATERIALS AND METHODS:

A. Test Plants: Dicotyledon plants were represented by thirteen species from multiple families (see section 3) for the emergence test. Monocotyledon plants were represented by seven species from one family. The species used for the vegetative vigor test were included in those used for the emergence test (see section 3). The vegetative vigor test plants were allowed to grow for 10 days after planting and were 2-5 inches tall at application.

B. Test System: Seeds were planted in galvanized trays (31.5 x 21.5 x 8 cm = 0.72 sq. ft.) that had holes in the bottom to facilitate watering. The soil used was a 50/50 mixture of loam soil and builders sand with an organic matter content of 1.25%. Four to 150 seeds were planted per species.

Each tray (two trays of different species for the emergence test and one tray for the vegetative vigor test) was sprayed with the test material using an atomizer which delivered 12.5 ml (over the top of emerged plants for the vegetative vigor test; on the soil surface for the emergence test) of solution at a pressure of 3-5 psi for a volume of 200 gallons per acre (GPA).

After treatment application, all trays were placed in a greenhouse maintained at 70-80°F. A 12-hour photoperiod was maintained using supplemental lighting. The trays were sub-irrigated as needed.

C. Dosage: The highest test solution (8 lb/A) was prepared by diluting 180 mg of the test material in a 1:1 acetone:ethanol solution which was further diluted to contain 4% ethanol and acetone and 0.1% Toximul R and S (used as a surfactant). Each tray received 60 mg of isoxaben for an equivalent field rate of 8 lb/A. Lower application rates were achieved by serial dilution. The nominal rates for the emergence study were 1, 2, 4, and 8 lb/A for seven of the twenty test species and 1, 2, and 4 lb/A for the remaining 13

species. The nominal rate for the vegetative vigor test was 8 lb/A.

D. **Design:** Each treatment/crop combination was replicated once. Plant injury was evaluated 18 days after treatment. The degree of plant injury was recorded on a scale from 1 to 5 as follows: 1 = no injury; 2 = slight injury; 3 = moderate injury; 4 = severe injury; 5 = no emergence or death of plants. The type of injury was observed and recorded as follows: D = death of plants; N = no emergence; R = reduced emergence; S = stunting.

E. **Statistics:** No statistical analyses were reported.

12. **REPORTED RESULTS:**

"Preemergence test - isoxaben did not injure cotton or wheat even at the highest rate tested of 4.0 lb/A. No emergence was noted, even at the 1.0 lb/A rate, for the following plants: jimsonweed, mustard, common lambsquarter, barnyardgrass, tomato, cucumber, sugarbeet, zinnia, foxtail millet, redroot pigweed, and large crabgrass. It was observed that corn, velvetleaf, soybean, and rice were injured severely and all were reduced in emergence. Further, morningglory, alfalfa, and wild oat were injured moderately and emergence was reduced for these plants also. This preemergence test confirms that isoxaben is indeed a strong preemergence herbicide.

Postemergence test - isoxaben demonstrated weak activity when applied postemergence. Isoxaben at 8.0 lb/A did not cause any injury to corn or velvetleaf and slight injury to foxtail millet, morningglory, and zinnia. Large crabgrass and redroot pigweed were both injured moderately at 8.0 lb/A. The only symptom recorded was stunting of plants, even when some injury was observed. This test showed that isoxaben has a very low level of herbicidal activity when sprayed postemergence."

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:**

No other conclusions other than those stated above were made by the author.

A statement was included in the report indicating that the study was not subject to Good Laboratory Practices at the time of performance and was not monitored by the Quality Assurance Unit. However, it was stated that the study was conducted within the principles of good laboratory practices.

14. REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS:

- A. Test Procedure:** The test procedures followed the SEP and Subdivision J guidelines except for the following:

No lot numbers, seed sources, or germination ratings were reported

Only one measure of plant damage (visual injury) was evaluated. At least two parameters (one qualitative and one quantitative) should be measured.

The study was not replicated.

Controls were not included in the study design.

No statistical analyses (e.g. no-observed-effect-concentration, EC values) were undertaken.

The percent active ingredient in the test material was not reported.

The species of crops selected for the tests were partially incorrect. Tests must be conducted with six species of dicots (from at least four families) and must include soybean and a root crop. Four species of monocot must be tested (from at least two families) and must include corn.

- B. Statistical Analysis:** Statistical analyses could not be conducted due to a lack of controls or replicates.

- C. Discussion/Results:** Results from the two studies are presented in Tables 1 and 2 (attached). Differing degrees of injury and various symptoms were noted on the test plants.

Multiple species were planted per tray. This situation leads to competition. Each species should be planted in separate pots with adequate dimensions to prevent competition.

This study is not scientifically sound and does not meet the guideline requirements for a Tier 2 seedling emergence or a Tier 1 vegetative vigor non-target plant phytotoxicity test.

- D. Adequacy of the Study:**

(1) **Classification:** Invalid.

(2) **Rationale:** Improper design (i.e., multiple plants per tray, lack of controls and replicates) precluded valid results from being drawn from the study.

(3) **Repairability:** No.

15. **COMPLETION OF ONE-LINER:** N/A.