

US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD

- 1. **CHEMICAL:** Acetochlor.  
Shaughnessey No. 121601.
- 2. **TEST MATERIAL:** Acetochlor; Batch No. A1016/9 P2; 89.4% active ingredient; a brown liquid.
- 3. **STUDY TYPE:** Avian Dietary LC<sub>50</sub> Test. Species Tested: Mallard duck (*Anas platyrhynchos*).
- 4. **CITATION:** Hakin, B., A.J. Norman, A. Anderson, and J.G. Maxwell. 1989. The Dietary Toxicity (LC<sub>50</sub>) of Acetochlor to the Mallard Duck. HRC Report No. ISN 190/89679. Performed by Huntingdon Research Center, Huntingdon, Cambridgeshire, UK. Submitted by ICI Agrochemicals, Haslemere, Surrey, UK. EPA MRID No. 415651-30.

5. **REVIEWED BY:**

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

Signature: *Mark Mossler*

Date: *11/3/91*

6. **APPROVED BY:**

Michael Whitten, M.S.  
Wildlife Toxicologist  
KBN Engineering and  
Applied Sciences, Inc.

Signature: *Michael L. Whitten*

Date: *10/3/91*

*Michael Dwyer*  
*1-15-92*

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

Signature:

Date: *for Donald Brown 2/15/92*

7. **CONCLUSIONS:** This study is scientifically sound and meets the guideline requirements for an avian dietary LC<sub>50</sub> toxicity test. The LC<sub>50</sub> value of acetochlor for mallard ducklings was >4171 ppm (mean measured concentration). Therefore, this compound is classified as slightly toxic to the mallard duck. The NOEC was 1118 ppm (mean measured concentration) based on reductions in weight gain.

8. **RECOMMENDATIONS:** N/A.

9. **BACKGROUND:**

10. DISCUSSION OF INDIVIDUAL TESTS: N/A.

11. MATERIALS AND METHODS:

A. Test Animals: Mallard ducklings (*Anas platyrhynchos*) were obtained from a supplier in Kent, UK. The birds were one-day old when received. All birds were acclimated to the caging and facilities for 7 days. The birds were 7 days of age at test initiation.

B. Test System: The birds were housed indoors in brooding pens. The pen floor measured 80 x 36 cm. The ceiling height was 30 cm. The brooders were constructed of galvanized steel with wire mesh floors. During the test, the mean daily temperature in the room was 28-31°C. The average relative humidity was 44 ±6.1%. A continuous photoperiod was used throughout the study.

The test diets were prepared by adding the test substance into the diet to form a pre-mix from which the final diets were prepared. The diets were prepared at test initiation and kept at room temperature until the end of the test.

The birds were offered water and feed ad libitum throughout the study. A list of the ingredients in the feed was given in the report and it appeared to be free of unfamiliar ingredients and medications.

C. Dosage: Acute dietary LC<sub>50</sub> test. Dosage levels selected for the study were 163, 325, 650, 1300, 2600, and 5200 ppm.

D. Design: Ten ducklings per test level and in each of three controls were assigned to numbered pens. Signs of toxicity, abnormal behavior, and mortality were assessed at least daily. Group body weights were measured at initiation, day 5, and day 8 of the test. Average feed consumption was determined by group for days 0-1, 1-2, 2-3, 3-4, 4-5, (the exposure period) and 6-8 (the observation period).

Three 200 g samples were taken during diet preparation for analysis of acetochlor by gas chromatography (GC).

A post-mortem examination was conducted on all birds in the highest test group and on all birds that died during the study.

E. **Statistics:** The  $LC_{50}$  value was estimated by visual assessment of the data due to the mortality pattern in this study.

12. **REPORTED RESULTS:** One mortality occurred in the controls on day 1. No further mortalities occurred. All birds remained in good health throughout the study.

There was a reduction in body weight gain at the two highest test concentrations (2600 and 5200 ppm) in comparison to the controls (Table 1, attached) for days 0-5. Birds in the highest exposure continued to show reductions in weight gain during days 6-8.

A reduction in feed consumption was noted in the highest test concentration (5200 ppm) in comparison to the controls (Table 2, attached) throughout the testing period.

No abnormalities were detected in any of the birds examined by post-mortem necropsy.

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

"No deaths occurred in any of the groups of Mallard ducks which were dosed with acetochlor. Therefore, the dietary toxicity  $LC_{50}$  value for acetochlor exceeded the highest dose used. This nominal value (5200 ppm) is adjusted to 4721 ppm when the calculated mean recovery from the diet is taken into account."

A Quality Assurance Unit Statement was included in the report indicating that the study conformed with Good Laboratory Practice standards published by the U.S. Environmental Protection Agency.

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

A. **Test Procedure:** The test procedures were in accordance with Subdivision E, ASTM, and SEP guidelines with the following exceptions:

It was not stated if the test material was technical or formulated product; the reviewer assumes it was technical.

The temperature in the brooder pens (28-31°C) was less than recommended (35°C).

It was not stated if the birds were phenotypically indistinguishable from wild birds.

The pen dimensions (80 x 36 cm = 2880 cm<sup>2</sup>) were less than recommended (70 x 100 cm = 7000 cm<sup>2</sup>).

Seven-day old ducklings were used. Five-day old ducklings are recommended.

Body weights were measured by group. Individual body weights should have been measured.

- B. **Statistical Analysis:** Since no birds died during the testing period, an LC<sub>50</sub> value and 95% confidence limits could not be obtained. A discussion of the LC<sub>50</sub> is presented below.
- C. **Discussion/Results:** A report on the analysis of the test material in the diet was included in the main report. The study verified that the test material was homogeneous throughout the diet, but that the concentration declined by 26-30% after 7 days of storage at room temperature. The reviewer multiplied the time 0 measured concentrations by 0.72 to obtain the theoretical measured concentrations after 7 days. The reviewer then calculated the mean of the day 0 and day 7 concentrations. This method better represents the actual concentrations the birds were exposed to over the test period. Mean measured concentrations were 134, 271, 552, 1118, 2228, and 4171 ppm.

The authors did not calculate a precise LC<sub>50</sub>; instead, the LC<sub>50</sub> was greater than 4171 ppm. Based on this value, the test material could be classified as either practically non-toxic (LC<sub>50</sub> >5000 ppm) or as slightly toxic (LC<sub>50</sub> from 1001-5000 ppm). For a study to meet required guidelines, a precise LC<sub>50</sub> must be established, or else the study must show that the LC<sub>50</sub> was greater than 5000 ppm. This study meets the requirements only if the LC<sub>50</sub> is classified as slightly toxic. Under this condition, the study is scientifically sound and meets the guideline requirements for an avian dietary LC<sub>50</sub> toxicity test. The NOEC was 1118 ppm (mean measured concentration) based on reductions in weight gain.

- D. **Adequacy of the Study:**
- (1) **Classification:** Core.
  - (2) **Rationale:** N/A.
  - (3) **Repairability:** N/A.

MRID No. 415651-30

15. COMPLETION OF ONE-LINER: Yes, 9-23-91.

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ACETOCHLOR

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