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WL-79-362

DATA EVALUATION RECORD

1. **CHEMICAL:** Acetochlor.
Shaughnessey number: 121601.

2. **TEST MATERIAL:** Acetochlor; MON-097; lot # NBP 1737874; 94.5% active ingredient; a reddish-purple liquid.

3. **STUDY TYPE:** Avian dietary LC_{50} Test.
Species Tested: Mallard duck (Anas platyrhynchos).

4. **CITATION:** Fink, R. 1980. Eight-day dietary LC_{50} - mallard duck. Submitted by Monsanto Company, St. Louis, Missouri. Study performed by Wildlife International Ltd., Easton, Maryland. Laboratory study # 139-182. Monsanto study # WL-79-362.

5. **REVIEWED BY:**

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

Signature: Michael L. Whitten
Date: 6-8-90

6. **APPROVED BY:**

Pim Kosalwat, Ph.D.
Staff Toxicologist
KBN Engineering and
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Signature: P. Kosalwat
Date: 6/12/90

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

Signature: Cynthia A. Mankin 10.29.90
Date: Henry T. Craven 10/30/90

7. **CONCLUSIONS:** Based upon nominal concentrations, the dietary LC_{50} of acetochlor was greater than 5620 ppm. This value classifies acetochlor as practically non-toxic to 14-day old mallards. The NOEC was 1780 ppm, based upon reduced body weight gain and food consumption at 3160 ppm. The study is scientifically sound and meets the requirements for an avian dietary LC_{50} test.

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8. **RECOMMENDATIONS:** N/A

9. **BACKGROUND:**

10. **DISCUSSION OF INDIVIDUAL TESTS:** N/A.

11. **MATERIALS AND METHODS:**

A. **Test Animals:** The birds used in the study were 14-day old mallard ducklings (Anas platyrhynchos) obtained from Wildlife International's own production flock. All birds were acclimated to the facilities from hatching until initiation of the study.

B. **Test System:** All birds were housed indoors in brooders measuring 72 cm x 90 cm x 24 cm high. The photoperiod was 14 hours of light per day. The brooder temperature was maintained at 75°F during the study.

C. **Dosage:** 8-day dietary LC_{50} test. Nominal dosages were 562, 1000, 1780, 3160, and 5620 parts per million (ppm). "For the purposes of diet preparation, the experimental material was assumed to be 100 percent active material and the LC_{50}, as reported, is therefore of the experimental material as received."

D. **Design:** Groups of ten birds were randomly assigned, without regard to sex, to each of five control groups, five laboratory standard (dieldrin) groups, and five treatment groups. All birds were fed Wildlife International Ltd.'s game bird starter ration. Food and water were supplied ad libitum during the test.

The test substance and dieldrin were dissolved in corn oil and added to the basal feed. The concentration of the solutions in the treatment and dieldrin diets was 2%. The birds were fed the appropriate dietary concentrations for five days, and then given untreated food for three days. The control birds received the basal diet throughout the study.

Mortality and symptoms of toxicity were recorded daily throughout the study. Birds were weighed by pen at initiation and at termination of the test on day 8. Food consumption was recorded by pen at the end of the five-day exposure period.

E. **Statistics:** Mortality was analyzed by probit analysis. No statistical analyses of body weight or food consumption were reported.

12. **REPORTED RESULTS:** There were no mortalities in any of the control pens. All control birds were normal in appearance and behavior throughout the study.

The report provided results on mortality and signs of toxicity in the dieldrin group.

There was no mortality, overt symptoms of toxicity, or behavioral abnormalities in any of the acetochlor treatment groups. There was, however, a dose related reduction in body weight gain and feed consumption at 3160 and 5620 ppm (Table 1, attached).

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:** The author presented no conclusions, but included the following statements in an executive summary: 1) There were no mortalities at any dietary level tested. 2) A dose-related reduction was noted in body weight gain and feed consumption at 3160 and 5620 ppm. 3) No abnormal behavioral signs were observed in any of the treated birds. 4) Owing to lack of mortalities in the study, the dietary LC_{50} for acetochlor to the mallard duck is greater than 5620 ppm.

The report stated that the study was conducted in conformance with Good Laboratory Practice regulations. Quality assurance audits were conducted and the final report was signed by the Quality Assurance Officer of Wildlife International Ltd.

An additional quality assurance measure was the inclusion of a laboratory standard treatment, commonly known as a positive, or reference control.

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

A. **Test Procedure:** The test procedures were in accordance with Subdivision E - Hazard Evaluation: Wildlife and Aquatic Organisms, ASTM, and SEP guidelines except for the following deviations:

The ducklings were 14 days of age at test initiation. Guidelines recommend that mallards be 5 to 10 days of age (preferably 5 days of age) at test initiation.

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

Food consumption was recorded at the end of test day 5. Food consumption should also have been recorded at the

beginning and end of the pre-treatment and observation periods.

The brooder temperature was 24°C (reported as 75°F). The SEP recommends a brooder temperature of "about 35°C."

The average ambient room temperature and relative humidity were not reported.

The concentration of test substance in the diet was not confirmed by chemical analysis. This is recommended, but not required, by ASTM.

The vehicle (corn oil) was not added to untreated diets. The control birds received the basal diet throughout the study.

B. **Statistical Analysis:** Since no birds died in the acetochlor treatment group, the LC_{50} cannot be calculated and is assumed to be greater than 5620 ppm, the highest concentration tested.

C. **Discussion/Results:** The ducklings were 14 days of age at test initiation. Guidelines recommend that mallards be 5 to 10 days of age (preferably 5 days of age) at test initiation. According to ASTM guidelines, the preferred age is based on the probability that test birds of this age will not survive without eating. While tests with older birds can be used to determine the LC_{50}, "if data from one test are to be considered comparable with data from another test, the ages of the birds between the two tests should deviate no more than one or two days." Although food consumption was reduced at the two highest concentrations, food consumption was high enough so that this was obviously not a case of the birds surviving without eating. Therefore, the advanced age of the birds is not a major flaw in the test design. As stated above, however, the results of this test should be compared only to other tests using birds of 12-16 days of age at test initiation.

It is unclear whether the reduced food consumption at 3160 and 5620 ppm was due to reduced palatability or to some other aspect of treatment. Regardless of the precise cause, the reduced body weight gain and food consumption at 3160 ppm and 5620 ppm must be assumed to be a treatment effect. Altered growth or development

of birds caused by exposure to these concentrations in the wild could result in reduced survival rates.

Since historical dieldrin values were not given, the reviewer could not assess the results reported from the laboratory standard (dieldrin) group.

The dietary LC_{50} of acetochlor was greater than 5620 ppm, the highest concentration tested. This value classifies acetochlor as practically non-toxic to 14 day-old mallard ducklings. The no-observed-effect concentration was 1780 ppm, based upon reduced body weight gain and food consumption at 3160 ppm.

With minor deviations, the study followed recommended guidelines. The study is scientifically sound and meets the requirements for an avian dietary LC_{50} test.

D. **Adequacy of the Study:**

(1) Classification: Core.

(2) Rationale: N/A.

(3) Repairability: N/A.

15. **COMPLETION OF ONE-LINER:** Yes; June 8, 1990.

ACETOCHLOR

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