12-2-93

MRID No. 419633-02

DATA EVALUATION RECORD

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

2. **TEST MATERIAL:** Acetochlor; Batch No. A1016/9-P2; 89.4% purity; a dark brown liquid.

3. **STUDY TYPE:** Avian Single Dose Oral LD_{50} Test.
Species Tested: Bobwhite quail (*Colinus virginianus*).

4. **CITATION:** Hakin, B., A.J. Norman, and I.S. Dawe. 1989. Acute Oral Toxicity (LD_{50}) of Acetochlor to the Bobwhite Quail. Study performed by Huntingdon Research Centre Ltd, Cambridgeshire, England. Laboratory study No. ISN 192/891139. Submitted by ICI Agrochemicals, Surrey, England. MRID No. 419633-02.

5. **REVIEWED BY:**

Carolyn F. Poppell, Sc.M.
Senior Scientist
KBN Engineering and
Applied Sciences, Inc.

Signature: Michael L. Whitten
Date: 11/18/91 For Carolyn Poppell

6. **APPROVED BY:**

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

Signature: Michael L. Whitten
Date: 11/18/91

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

Signature: William S Robert for H.T. Craven
Date: 10/19/93 12/2/93

7. **CONCLUSIONS:** The acute oral LD_{50} of acetochlor was not determined because of the pattern of mortalities observed in treatment groups. The NOEL could not be determined because toxic effects were observed at all dose levels. The study is scientifically sound but does not meet the requirements for an avian LD_{50} test.

8. **RECOMMENDATIONS:** N/A

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9. **BACKGROUND:**

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

11. **MATERIALS AND METHODS:**

A. **Test Animals:** The birds used in the study were young adult bobwhite quail (*Colinus virginianus*) over 16 weeks of age. The birds were obtained from D.R. and R.E. Wise, Cambridgeshire, England. All birds were acclimated to the facilities for 14 days prior to dosing.

B. **Test System:** All birds were housed indoors in pens constructed of stainless steel wire. Pen dimensions were not specified in the report. Artificial lights provided 7 hours of light per day. Maximum and minimum temperatures and the relative humidity of the animal room were recorded once daily. The average temperature ranged from a minimum of 21°C ± 1°C to a maximum of 24°C ± 1.5°C (SD). The average relative humidity was 76% ± 7.6% (SD).

C. **Dosage:** 14-day single dose oral LD_{50} test. Based upon an initial range-finding study, nominal dosages selected for the study were 521, 729, 1020, 1429, and 2000 milligrams of acetochlor per kilogram of body weight (mg/kg). The dosages and reported LD_{50} value were not corrected for purity of the test substance. Analyses of the test formulations were conducted by Huntingdon Research Centre Ltd. to determine the concentration of acetochlor in dose preparations used in the study.

D. **Design:** Groups of ten birds (five males and five females) were allocated to each of five treatment groups and one control group, so that all groups initially had similar mean bodyweights. Water was available at all times and food was offered ad libitum with the exception of an overnight starvation period of at least 15 hours prior to dosing. The birds were offered standard Huntingdon Research Centre layer diet in pellet form from Joseph Odam Ltd., Cambridgeshire, England. The test substance was administered in suspension in corn oil by oral gavage using a disposable syringe and a plastic catheter. Each bird was individually weighed and dosed on the basis of milligrams of test substance per kilogram of body weight. The control birds received a corresponding volume of corn oil only.

Bird health and mortalities were observed daily throughout the study period. The birds were individually weighed during acclimation (days -14 and -7) and on days 0, 7 and 14 of the test period. Group mean food consumption was determined weekly throughout the acclimation period and the study period.

Macroscopic post-mortem examinations were performed on all birds that died during the study and on 10 surviving birds from the highest dosage groups.

E. Statistics: Due to the pattern of mortality, the LD_{50} was not calculated.

12. **REPORTED RESULTS:** There were no mortalities in the control group. Mortalities of 40 to 60% were observed in each of the five treatment groups (Table 1).

Toxic effects were observed at all dose levels. Birds at the three highest dose levels became subdued on day 1, with some birds at the two highest dosages passing watery excreta. By the end of day 2, birds in the 1429 mg/kg and 2000 mg/kg dosage groups remained subdued until the end of day 3. Two birds in the 2000 mg/kg dosage group were unsteady and had ruffled feathers at the end of day 2 and remained subdued with ruffled feathers until they died on day 5. One bird in the 1429 mg/kg group became subdued on day 4 and died on day 6. On day 5, one bird in the 729 mg/kg group was weak, and one bird in the 1020 mg/kg dosage group was subdued and unsteady. Both birds died on day 5. At the end of day 5, another bird in the 729 mg/kg dosage group was subdued with ruffled feathers, and two birds in the 1020 mg/kg group were unable to stand. The bird at the 729 mg/kg dosage level and one bird in the 1020 mg/kg dosage group died on day 6. One of the birds in the 1020 mg/kg dosage group recovered by the end of day 7. At the beginning of day 6, one bird at the 1429 mg/kg dosage level was subdued and unsteady with ruffled feathers. This bird died at the end of day 6. No clinical signs of toxicity were observed in any bird after the end of day 7, and all surviving birds remained in good health for the rest of the study period.

A white powdery deposit was observed on the heart, liver, gizzard, and intestines of the 19 birds that died on days 4, 5, and 6 of the study. No abnormalities were detected in the post-mortem examination of birds that died on day 1 or in any birds examined at termination of the study.

No apparent effects on body weight change (Table 2, attached) or food consumption (Table 3, attached) were noted at any test interval.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:** The acute oral LD_{50} of acetochlor could not be determined because of the spread of mortalities in treatment groups. Toxic effects were observed at all dose levels. Therefore, it was not possible to determine a no-effect level under the conditions of this experiment.

The report stated that the study was conducted in conformance with Good Laboratory Practice regulations. The "Good Laboratory Practice Compliance Statement" was signed by representatives of Huntingdon Research Center Ltd. and ICI Americas, Inc.

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

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

The authors did not report an LD_{50} value, because "partial kills" of 40-60% occurred at all treatment levels.

Pen size was not specified.

Birds were not randomly allocated to treatment groups, as stipulated by the SEP guidelines. Rather, birds were selected and allocated so that all groups had similar mean bodyweights at the study initiation.

B. **Statistical Analysis:** The reviewer calculated the LD_{50} using EPA's Toxanal computer program (attached). Using the Binomial Test, an LD_{50} of 1691 mg/kg was calculated. The Moving Average Method and the Probit Method both calculated an LD_{50} of 1429 mg/kg. Confidence limits could not be calculated using these methods because of the spread of mortalities in the treatment groups. The authors did not report an LD_{50} value.

C. **Discussion/Results:** The study's most serious deviation from recommended guidelines is that "partial kills" of 40-60% occurred at each treatment level, which does not provide a statistically reliable basis for derivation of an LD_{50}. Therefore, because the LD_{50} could not be

derived with reliability, the study does not meet the requirements for an avian LD_{50} study.

The author's conclusion of no apparent effects on body weight change or food consumption is accepted after a visual inspection of Tables 2 and 3 (attached). However, the body weight data were variable among groups, preventing a firm conclusion regarding body weight.

D. **Adequacy of the Study:**

(1) **Classification:** Supplemental.

(2) **Rationale:** The unusual mortality pattern (40-60% in all treatment groups) prevents the calculation of a statistically reliable LD_{50}.

(3) **Repairability:** No.

15. **COMPLETION OF ONE-LINER:** Yes; October 16, 1991.

ACETOCHLOR

Page_____ is not included in this copy.

Pages 6 through 8 are not included.

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MRID # 419633-02

CAROLYN POPPELL ACETOCHLOR BOBWHITE QUAIL 10-16-91

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
2000	10	6	60.00001	37.69531
1429	10	4	40	37.69531
1020	10	5	50	62.30469
729	10	4	40	37.69531
521	10	5	50	62.30469

THE BINOMIAL TEST SHOWS THAT 0 AND +INFINITY 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 1690.563

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	5.425027	1428.523	0	+INFINITY

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
2	24.04155	1	.8102615

SLOPE = .3436735

95 PERCENT CONFIDENCE LIMITS =-1.341433 AND 2.02878

LC50 = 1428.707

95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

LC10 = .2881216

95 PERCENT CONFIDENCE LIMITS = 0 AND 274.2056

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