File copy

1-15-91

WL-80-003

9981 2

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 single dose oral LD_{50} test.
Species Tested: Bobwhite quail (Colinus virginianus).

4. **CITATION:** Fink, R. 1980. Acute oral LD_{50} - bobwhite quail. Submitted by Monsanto Company, St. Louis, Missouri. Study performed by Wildlife International Ltd., Easton, Maryland. Laboratory study # 139-183. Monsanto study # WL-80-003.

5. **REVIEWED BY:**
Cynthia Moulton
Wildlife Biologist
EEB/EFED
Cynthia A. Moulton 1.15.91

6. **APPROVED BY:**
Norman Cook
Section Head 2
EEB/EFED
Norman Cook 1.15.91

7. **CONCLUSIONS:** The study is scientifically sound and meets the requirements for an avian oral LD_{50} test. An accurate does response curve could not be obtained, however an LD_{50} was estimated by the moving average method as 1567.1 mg a.i./kg with confidence intervals between 1316.0 - 1974.3. A NOEL could not be determined due to sublethal toxicity effects at all dosage levels, therefore the NOEL is less than 398 mg a.i./kg (the lowest dosage tested). Sublethal effects can have adverse effects on wild bird populations.

8. **RECOMMENDATIONS:** N/A

9. **BACKGROUND:**

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

11. MATERIALS AND METHODS:

A. Test Animals: Bobwhite quail (Colinus virginianus) were obtained from the production flock of Wildlife International Ltd. The conditions under which the birds were hatched and reared before acclimation were described in the report. All birds were acclimated to the facilities for 14 days prior to initiation of the study. Birds exhibiting abnormal behavior or physical injury during acclimation were not used in the test. The quail were approximately 5 months of age at test initiation.

B. Test System: All birds were housed indoors in pens measuring 72 cm x 90 cm x 24 cm high. The photoperiod was 14 hours of light per day. The temperature was maintained between 65°F and 75°F.

C. Dosage: 14-day single dose oral LD_{50} test. Nominal dosages were 398, 631, 1000, 1590, and 2510 milligrams of test material per kilogram of body weight (mg/kg). "For the purposes of dosage administration and LD_{50} calculations, the experimental material was assumed to be 100 percent active material and the LD_{50}, as reported, is therefore of the experimental material as received."

D. Design: Groups of ten birds (five males and five females) were randomly assigned to each of the five treatment groups and the control group. The birds were fed a game bird ration formulated to Wildlife International Ltd.'s specifications. Food and water were supplied ad libitum except for a period of 16 hours prior to dosing when food was withheld. The test material was dissolved in corn oil and intubated into the crop of each bird using a stainless steel 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. All treatment and control birds received a constant volume to body weight dose. The birds were individually weighed at test initiation and by group on days 3, 7, and 14. Group food consumption was recorded on test days 7 and 14. Observations were conducted daily for mortality and potential clinical signs indicative of test material effect.

E. **Statistics:** The LD_{50} and 95% confidence limits were calculated by probit analysis. No statistical analyses of body weight or food consumption were reported.

12. **REPORTED RESULTS:** There were no mortalities or behavioral abnormalities in the control group.

There was 30% mortality at 398 mg/kg, 10% mortality at 1000 mg/kg, 30% mortality at 1590 mg/kg, and 100% mortality at 2510 mg/kg (Table 1, attached).

At 398 and 631 mg/kg, some birds displayed a ruffled appearance and lower limb weakness from day 4 through day 8. Loose droppings were noted during days 1 and 2 at 631 mg/kg. A similar pattern was observed at 1000 mg/kg. Additionally, one bird at 1000 mg/kg appeared lethargic on day 5.

At 1590 mg/kg, most birds appeared lethargic, and displayed a ruffled appearance and lower limb weakness from day 1 through day 4. Runny droppings were noted during days 1 and 2. All surviving birds were normal in appearance and behavior from day 7 until study termination.

At 2510 mg/kg, signs of toxicity included lethargy, depression, reduced reaction to external stimuli, wing droop, loss of coordination, lower limb weakness, prostrate posture, and loss of righting reflex. Runny droppings were noted during days 1 and 2.

The acute oral LD_{50} was calculated to be 1560 mg/kg, with 95% confidence limits of 1044 to 2329 mg/kg.

"There was a slight reduction in body weight on day 3 at the 1000 mg/kg dosage level, and a more marked reduction in body weight at the 1590 mg/kg dosage level on days 3 and 7. Some increase in body weight of the surviving birds at this dosage level was noted by day 14. There was also a slight reduction in feed consumption at this dosage level for the first seven days and a compensatory increase during the final seven days of the study." Body weights and feed consumption are presented in Table 2 (attached).

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:** The author presented no conclusions, but included the following statements in an executive summary: 1) No overt signs of toxicity or mortalities were observed in the control group. 2) There was a dose-related increase in mortality. 3) After an initial period of reduced body weight gain, the quail appeared to recover. Body weight of the three groups receiving the lowest treatment (398, 631,

and 1000 mg/kg) was comparable to controls at termination of the study. 4) The acute oral LD_{50} of acetochlor in bobwhite was found to be 1560 mg/kg.

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.

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, and SEP guidelines except for the following deviations:

Body weights were measured by group on days 3, 7, and 14. Individual body weights should have been measured.

The photoperiod was 14 hours of light per day; the guidelines recommend 10 hours of light per day.

Necropsies were not conducted. Necropsies are encouraged, but not required, by Subdivision E and the SEP.

Loose to runny droppings were noted in birds at all treatment levels.

B. Statistical Analysis: A statistical analysis was not be performed on this data because of the erratic mortality pattern exhibited by the birds in this study.

C. Discussion/Results: The author stated in the executive summary that there was a dose-related increase in mortality. This is actually not correct, as Table 1 indicates. The three birds that died at the lowest dosage (398 mg/kg), followed by no mortality at 631 mg/kg, provide data that do not conform to a typical dose-response pattern. Loose and runny droppings were observed for birds in the 631 mg/kg concentrations and above. This may indicate that quail in the higher dose levels were able to "drop" the chemical from their system, thus reducing their mortality, causing the odd mortality pattern seen. This could have inflated the LD_{50} value.

The author stated that there was a slight reduction in body weight on day 3 at 1000 and 1590 mg/kg, but did not

mention that body weights also decreased from day 1 to day 3 at 398 and 631 mg/kg.

The NOEL could not be determined due to symptoms of toxicity at all dosage levels.

D. **Adequacy of the Study:**

(1) **Classification:** Core.

(2) **Rationale:** Although an accurate dose response curve could not be obtained, further study would not likely give a better estimation of the actual LD_{50} of Acetochlor to bobwhite (see reviewer discussion in section 14). It should be noted that a NOEL could not be determined as sublethal toxicity effects occurred at all dose levels.

(3) **Repairability:** N/A.

15. **COMPLETION OF ONE-LINER:** Yes; May 30, 1990.

5

ACETOCHLOR

Page_____ is not included in this copy.

Pages 6 through 7 are not included.

The material not included contains the following type of information:

____ Identity of product inert ingredients.

____ Identity of product impurities.

____ Description of the product manufacturing process.

____ Description of quality control procedures.

____ Identity of the source of product ingredients.

____ Sales or other commercial/financial information.

____ A draft product label.

____ The product confidential statement of formula.

____ Information about a pending registration action.

X FIFRA registration data.

____ The document is a duplicate of page(s) _____.

____ The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

WHITTEN ACETOCHLOR COLINUS VIRGINIANUS 05-30-90

****

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
2510	10	10	100	9.765625E-02
1590	10	3	30	17.1875
1000	10	1	10	1.074219
631	10	0	0	9.765625E-02
398	10	3	30	17.1875

THE BINOMIAL TEST SHOWS THAT 0 AND 2510 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 1764.65

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	.1144044	1567.124	1315.977	1974.346

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
6	5.892941	6.172296	0

A PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001.

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 2.505637
95 PERCENT CONFIDENCE LIMITS =-3.576892 AND 8.588166

LC50 = 1559.628
95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

LC10 = 485.4718
95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

****