

DATA EVALUATION RECORD

1. CHEMICAL: Triclopyr triethylamine.
Shaughnessey Number: 116002.
2. TEST MATERIAL: Triclopyr triethylamine salt;
purity: $64.7 \pm 2\%$ in water; a purple liquid with a slight
odor.
3. STUDY TYPE: Avian dietary LC_{50} test.
Species Tested: Bobwhite quail (Colinus virginianus).
4. CITATION: Fink, R. 1978. Eight-day dietary LC_{50} - bobwhite
quail triclopyr triethylamine salt final report. Study
performed by Wildlife International Ltd., Easton, Maryland.
Laboratory study # 103-170. Submitted by Dow Chemical
U.S.A., Midland, Michigan. MRID No. 92189003 (NR 403465-
03).

5. REVIEWED BY:

Jeffrey Bigler
Ecological Effects Branch
Environmental Fate and
Effects Division

Signature: *J. Bigler*

Date: 3-6-91

6. APPROVED BY:

Charles Lewis
Ecological Effects Branch
Environmental Fate and
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Signature: *Charles Lewis*

Date: 3/14/91

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

Signature:

Date:

7. CONCLUSIONS: The study is scientifically sound but does not
fulfill the requirements for an avian dietary LC_{50} test.
Under the conditions of this study, and based upon nominal
concentrations, the dietary LC_{50} of triclopyr triethylamine
was 11622 ppm. This value classifies triclopyr
triethylamine as practically non-toxic to bobwhite chicks.
The NOEC was 1000 ppm, based upon reduced body weight gain
at all higher concentrations.

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 bobwhite quail (Colinus virginianus) hatched from eggs obtained from Wildlife International's own production flock.
- B. Test System: The pen facilities in which the birds were housed during the study were not described. The photoperiod was 14 hours of light per day. The brooder temperature was maintained at 100°F.
- C. Dosage: 8-day dietary LC₅₀ test. Nominal concentrations were 464, 1000, 2150, 4640, and 10,000 parts per million (ppm). "For the purposes of diet preparation, the experimental material was assumed to be 100 percent active material and the LC₅₀, 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.

Information regarding the methods for behavioral observations, and determination of body weight and food consumption was not included in the report.

- E. Statistics: Mortality was analyzed by probit analysis.

12. REPORTED RESULTS: There were two mortalities in the control group; one on day 4 and one on day 7. Behavioral observations of birds in the control group were not included in the report.

The report provided results on mortality, but not on symptoms of toxicity in the dieldrin group.

Mortality in the triclopyr triethylamine treatment group during the study was 40% at 10,000 ppm, and 10% at 4640 ppm (Table 1, attached). Based upon nominal concentrations, the LC_{50} was 11,622 ppm, with 95% confidence limits of 6,390 - 21,139 ppm.

At 10,000 ppm, lethargy, a ruffled appearance, wing droop, lower limb weakness, and loss of coordination became apparent on day 4. By day 5, many birds at this level were also displaying depression and reduced reaction to external stimuli. Symptoms of toxicity were less severe on day 6, but the birds remained lethargic until the end of the test period.

At 4640 ppm, lethargy, wing droop, and a ruffled appearance were the only overt signs of toxicity.

Birds at all other dose levels displayed no signs of toxicity during the test period.

There was a dose related reduction in body weight gain at the 2150 ppm through 10,000 ppm dose levels, and a reduction in feed consumption at the 4640 and 10,000 ppm dose levels (Table 2, attached).

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

The author presented no conclusions, but included the following statement as a summary: "The acute LC_{50} of Triclopyr-Triethylamine Salt in the Bobwhite quail is 11,622 ppm, confidence limits 6390 to 21,139 ppm."

The report included no statements regarding quality assurance. One 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: This study was conducted in December 1977 and January 1978, before the current SEP, ASTM, and Subdivision E Guidelines were published. However, the test procedures were in accordance with current guidelines except for the following deviations:

At termination of the test, 72 consecutive hours without mortality in the treatment groups had not occurred.

The average ambient relative humidity was not reported.

A full description of the test facilities (construction material, dimensions) was not reported.

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

Necropsies were not conducted. These are recommended, but not required, by guidelines.

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

In addition to the above deviations, the report was missing one page. Information regarding the methods for behavioral observations, determination of body weight and food consumption, and the results of behavioral observations in the control group was not included in the report. This information was probably included on the missing page (page 4, as numbered in the top center of the page).

- B. Statistical Analysis: The LC_{50} value calculated (attached) by using EPA's Toxanal computer program was 11622 ppm, the same value as that reported by the author.
- C. Discussion/Results: Table 1 (attached) shows that one bird died on day 7, i.e., within 48 hours of test termination. Subdivision E states that at the end of the test "There must be at least 72 consecutive hours without treatment mortality ..." and that the test should be extended, if necessary, to provide this mortality-free period. Without a mortality-free period, it can not be shown that treatment-related mortality has ceased. In such a case, the resulting LC_{50} is of limited value in a risk assessment.

Other discrepancies noted in Section 14.A (above) probably did not affect the validity of the study.

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

The 95% confidence interval (6390 to 21139 ppm reported by the author; 7649 to 3147052 ppm obtained by EPA's toxanal program) is quite large. This is a result of the mortality pattern in the test: mortality occurred in only two treatment groups, and a mortality rate of 50% occurred in neither of those groups. In order to provide statistically reliable results, a toxicity test should produce at least three partial kills (i.e., mortality between 0 and 100%). Since any test material with an LC_{50} value > 5000 ppm is considered to be practically non-toxic, this LC_{50} value and confidence interval would be acceptable, if not for the lack of a 72 hour mortality free period as discussed above.

Under the conditions of this test, the dietary LC_{50} of triclopyr triethylamine was 11622 ppm. This value classifies triclopyr triethylamine as practically non-toxic to bobwhite chicks. However, at test termination a 72-hour mortality-free period had not occurred, and birds in the 10,000-ppm group were still exhibiting signs of toxicity (i.e., lethargy).

The no-observed-effect concentration was 1000 ppm, based upon reduced body weight gain at all higher concentrations.

The study is scientifically sound but does not meet the requirements for an avian dietary LC_{50} test.

D. Adequacy of the Study:

- (1) **Classification:** Supplemental.
- (2) **Rationale:** At test termination a 72-hour mortality-free period had not occurred. Otherwise, the study followed recommended guidelines except for minor deviations.
- (3) **Repairability:** No.

15. **COMPLETION OF ONE-LINER:** Yes; January 23, 1991.

TABLE 1

WILDLIFE INTERNATIONAL LTD.

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TRICLOPYR-TRIETHYLAMINE SALT

Dosage ppm	Time of Death Day							
	1	2	3	4	5	6	7	8
464	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10
1,000	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10
2,150	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10
4,640	0/10	0/10	0/10	0/10	0/10	1/10	1/10	1/10
10,000	0/10	0/10	0/10	0/10	1/10	3/10	4/10	4/10

LC50 is 11,622 ppm, confidence limits (95%) 6390 to 21,139 ppm.

LABORATORY STANDARD

Dosage ppm	Time of Death Day							
	1	2	3	4	5	6	7	8
21.5	0/10	0/10	0/10	0/10	0/10	1/10	1/10	1/10
31.6	0/10	0/10	0/10	0/10	0/10	1/10	1/10	2/10
46.4	0/10	0/10	0/10	2/10	3/10	4/10	5/10	5/10
68.2	0/10	0/10	2/10	3/10	6/10	8/10	9/10	9/10
100.2	0/10	0/10	2/10	7/10	8/10	9/10	10/10	10/10

LC50 is 42 ppm, confidence limits (95%) 35 to 51 ppm.

CONTROLS

Dosage ppm	Time of Death Day							
	1	2	3	4	5	6	7	8
0	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10
0	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10
0	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10
0	0/10	0/10	0/10	1/10	1/10	1/10	2/10	2/10
0	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10

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TABLE 2

WILDLIFE INTERNATIONAL LTD.

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Material	Concentration ppm	Average Body Weight (g)		Total Estimated Food Consumption During Five-Day Exposure Period g
		Day 0	Day 8	
Triclopyr- Triethylamine Salt	464	29	42	351
	1,000	26	39	426
	2,150	26	37	425
	4,640	27	34	385
	10,000	29	30	173
Laboratory Standard	21.5	28	43	348
	31.8	32	37	276
	46.4	31	34	254
	68.2	32	28	163
	100.2	28	*	119
Controls	0	31	49	351
	0	31	50	418
	0	31	49	370
	0	30	41	287
	0	31	49	345

*Data not available due to total mortality.

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JBB:RF/ada
Attachments

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WHITTEN TRICLOPYR TRIETHYLAMINE COLINUS VIRGINIANUS 1-23-91

CONC.	NUMBER EXPDSED	NUMBER DEAD	PERCENT OED	BINOMIAL PROB.(PERCENT)
10000	10	4	40	37.69531
4640	10	1	10	1.074219
2150	10	0	0	9.765625E-02
1000	10	0	0	9.765625E-02
464	10	0	0	9.765625E-02

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 0

THE MOVING AVERAGE METHOD CANNOT BE USED WITH THIS DATA SET
BECAUSE NO SPAN WHICH PRODUCES MOVING AVERAGE ANGLES THAT
BRACKET 45 DEGREES ALSO USES TWO PERCENT OED BETWEEN 0 AND
100 PERCENT.

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
6	.8472814	1	.992185

SLOPE = 3.466262 *

95 PERCENT CONFIDENCE LIMITS = .275641 AND 6.656883

LC50 = 11622.15 *

95 PERCENT CONFIDENCE LIMITS = 7649.242 AND 3147052 *

LC10 = 4999.166

95 PERCENT CONFIDENCE LIMITS = 50.47071 AND 7590.321

Shanahan/Ho. 116002Chemical Name Triclopyr
triethylamine

Chemical Class _____

Page 1 of 1Study/Species/Lab/
Accession _____Chemical
E a. i.

Results

Reviewer/
Date _____Validation
Status _____14-Day Single Dose Oral LD₅₀LD₅₀ = _____ mg/kg (95% C.L.) Contr. Mort. (X) = _____

Species _____

Slope = _____ # Animals/Level = _____ Age (Days) = _____

Sex = _____

Lab _____

14-Day Dose Level mg/kg/(X Mortality)
() , () , () , () , () , () , ()

Acc. _____

Comments: _____

14-Day Single Dose Oral LD₅₀LD₅₀ = _____ mg/kg (95% C.L.) Contr. Mort. (X) = _____

Species _____

Slope = _____ # Animals/Level = _____ Age (Days) = _____

Sex = _____

Lab _____

14-Day Dose Level mg/kg/(X Mortality)
() , () , () , () , () , () , ()

Acc. _____

Comments: _____

8-Day Dietary LC₅₀LC₅₀ = 11,622 ppm (95% C.L.) Contr. Mort. (X) = 4%Species Bobwhite
(*Colinus virginianus*)

Slope = 3.5 # Animals/Level = 10

Age (Days) = 14

Sex = Unknown

Lab Wildlife International

8-Day Dose Level ppm/(X Mortality)
464 (0) , 1000 (0) , 2150 (0) , 4640 (10) , 10000 (40)Accession No. 92189003
(NR 403465-03)

Comments: NOEC = 1000 ppm ; Dosages are nominal concentrations

8-Day Dietary LC₅₀LC₅₀ = _____ ppm (95% C.L.) Contr. Mort. (X) = _____

Species _____

Slope = _____ # Animals/Level = _____ Age (Days) = _____

Sex = _____

Lab _____

8-Day Dose Level ppm/(X Mortality)
() , () , () , () , () , () , ()

Acc. _____

Comments: _____

48-Hour LC₅₀LC₅₀ = _____ pp (95% C.L.) Contr. Mort. (X) = _____

Species _____

Slope = _____ # Animals/Level = _____

Sol. Contr. Mort. (X) = _____

Lab _____

48-Hour Dose Level pp/(X Mortality)
() , () , () , () , () , () , ()

Acc. _____

Comments: _____

96-Hour LC₅₀LC₅₀ = _____ pp (95% C.L.) Contr. Mort. (X) = _____

Species _____

Slope = _____ # Animals/Level = _____

Sol. Contr. Mort. (X) = _____

Lab _____

96-Hour Dose Level pp/(X Mortality)
() , () , () , () , () , () , ()

Acc. _____

Comments: _____

96-Hour LC₅₀LC₅₀ = _____ pp (95% C.L.) Contr. Mort. (X) = _____

Species _____

Slope = _____ # Animals/Level = _____

Sol. Contr. Mort. (X) = _____

Lab _____

96-Hour Dose Level pp/(X Mortality)
() , () , () , () , () , () , ()

Acc. _____

Comments: _____