3-27-92

MRID No. 420553-10.

DATA EVALUATION RECORD

1. **CHEMICAL**: NTN 33893
   Shaughnessy No. ~~129059~~ 129099

2. **TEST MATERIAL**: Technical NTN 33893, 94.8%

3. **STUDY TYPE**: Avian Dietary LC50, Bobwhite Quail (Colinus virginianus).

4. **CITATION**: Toll, P. A. 1990. "Technical NTN 33893: Subacute Dietary LC50 With Bobwhite Quail." Mobay Corporation, Agricultural Chemicals Division Research and Development Department, Biochemistry/Ecological Effects, 17745 South Metcalf, Stilwell, Kansas 66085-9104. Report Number 100241. Submitted by Mobay Corporation, P.O. Box 4913, Kansas City, Missouri 64120-0013. USEPA MRID No. 420553-10.

5. **REVIEWED BY**:

   Dana Lateulere, Biologist
   Ecological Effects Branch
   Environmental Fate and
   Effects Division

   Signature: Dana Lateulere
   Date: 3/27/92

6. **APPROVED BY**:

   Ann Stavola, Section Head, 5
   Ecological Effects Branch
   Environmental Fate and
   Effects Division

   Signature: Ann Stavola
   Date: 3/27/92

7. **CONCLUSIONS**: This study is scientifically sound and fulfills guideline requirements. The test produced control mortality and none of the lower concentrations produced zero mortality, therefore, the data was subjected to Abbott's correction. Utilizing the probit method the LC50 was determined to be 1535.87 ppm; 95% confidence interval of 796.8 - 4774.5 ppm. Based on these values NTN 33893 is classified as slightly toxic to bobwhite quail. The LOEC was determined to be 69 ppm and the NOEC was <69 ppm. NTN 33893 is classified as slightly toxic to upland gamebirds.

8. **RECOMMENDATIONS**:

9. **BACKGROUND**: This study is submitted as part of a data package for an EUP and for registration requirements.

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

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11. **MATERIALS AND METHODS:**

A. **Test Animals:** Bobwhite quail eggs were obtained from Barrett's Quail Farm, Houston, TX and hatched at the Ecological Effects avian facility. Upon hatch, the chicks were housed in galvanized steel brooders maintained at an internal temperature range of approximately 100°F to ambient temperature (72°F) for the acclimation period and throughout the test. The birds were acclimated for 6 days prior to being randomized into test groups. Unsuitable birds were eliminated from inclusion in the test prior to assignment to test groups.

B. **Test System:** At seven days of age ten birds of unknown sex weighing 15 to 24 grams were allocated to each of seven treatment and two control groups (one negative and one vehicle). Once randomization was complete, feed consumption was monitored for three days prior to the initiation of the test.

Following the 3 day pre-test period the birds were given feed containing technical grade NTN 33893 for 5 days, then were given a control feed for an 8 day observation period.

Body weights were recorded at test initiation, day 5 and termination. Feed consumption for each group was recorded daily.

C. **Dosage:** Based on results from a range finding study the NTN 33893 nominal dietary concentration was set at 78, 156, 312, 625, 1250, 2500 and 5000 ppm. Compensation was made for the NTN 33893 purity in calculating the diet concentration. Measured concentrations were 69, 145, 285, 567, 1168, 2290, and 4690 ppm. Negative control birds received only raw feed; vehicle control diets were prepared with the same amount of acetone and the same proportional amount of corn oil as the treated diets.

D. **Design:** Observations for mortality and clinical signs of intoxication were recorded .5, 1, 2, and 4 hours post-initiation, then twice daily throughout the remainder of the study except on weekends and holidays when only one observation was made. At the end of the study all surviving birds were sacrificed by CO_2 asphyxiation. Necropsy examinations were conducted on

all surviving birds as well as any birds that died during the course of the study.

E. **Statistics**: The acute oral LD50 was calculated using a computer program which estimated the LD50 using one of three statistical techniques: moving average, binomial probability, or probit. The appropriate method was determined on the basis of data characteristics. For parametric procedures, body weight and feed consumption data for all treatment levels were subject to a standard one-way analysis of variance.

12. **REPORTED RESULTS**: Treatment-related mortality occurred in all dietary groups ≥69 ppm. Clinical signs of toxicity noted in the intoxicated birds included ataxia, wing drop, hyporeactivity, diarrhea, opisthotonos (arching of the neck over the back) and immobility (see Table 2). Symptoms were first observed one hour after birds received the treated feed and some birds showed symptoms of ataxia and wing drop for as long as 12 days.

There was no significant difference between control groups in terms of body weight or feed consumption; therefore, the two groups were combined for subsequent analyses. A significant decrease in body weight was noted on day 5 in all exposure groups ≥567 ppm when compared to controls; depressed body weights were apparent again at termination only at 4649 ppm. The data showed that concentrations ≥145 ppm gained less weight than controls from day 0 to day 5. However, the data showed that birds exposed gained weight equal to the controls during the observation period, indicating recovery.

Feed consumption data showed that treated groups ≥285 ppm consumed less feed than controls during the five day exposure period. This data would indicate an aversion to or unpalatability of NTN 33893 treated feed. Feed consumption continued to be depressed at concentrations ≥2290 ppm during the eight day observation period compared to controls. Feed consumption for all other groups returned to or exceeded the control levels during this time period.

A summary of the postmortem examination of those birds found dead during the study or sacrificed at study termination are presented in Table 6. The examinations showed only birds which were found dead contained observable lesions. These lesions were mainly those associated with postmortem autolysis . These lesions although treatment-related, were not considered compound-related. No grossly observable

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lesions were noted in any of the birds sacrificed at the termination of the study.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:** Body weight gains were depressed at concentrations ≥145 ppm and feed consumption data suggest NTN 33893 treated diets at higher concentrations was unpalatable with aversion shown by individual birds even at lower concentrations. Mortality was exhibited at dietary levels ≥69 ppm with mortality at the lower concentrations due to individual birds showing an aversion to the feed causing them to fast, and thus die of starvation. There was no mortality in the controls.

Based on the results of this study, the subacute dietary LC50 of technical grade NTN 33893 in Bobwhite quail is 1420 ppm (confidence interval of 713 - 4503 ppm, 95%). Based on body weight data the NOEC was 69 ppm with a LOEC of 145 ppm. Based on mortality and symptoms observed the NOEC was <69 ppm.

Quality Assurance Inspection was conducted for compliance verification by the Quality Assurance Unit. It was also stated that this study was conducted in compliance with the Good Laboratory Practice Standards.

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

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

B. **Statistical Analysis:** The reviewer used Toxanol to determine the LD50 and the corresponding 95% confidence interval. See attached.

C. **Discussion/Results:** The test produced control mortality and none of the lower concentrations produced zero mortality, therefore, the data was subjected to Abbott's correction. Utilizing the probit method the LC50 was determined to be 1535.87 ppm; 95% confidence interval of 796.8 - 4774.5 ppm. Based on these values NTN 33893 is classified as slightly toxic to bobwhite quail.

Based on reported results the LOEC was 69 ppm and the NOEC was <69 ppm. If the mortalities at ≤69 ppm were due to an aversion to the feed, it must still be considered an effect of the toxicant and therefore, was used in determining the NOEC.

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D. Adequacy of the Study:

(1) Classification: Core.

(2) Rationale:

(3) Repairability:

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NOTE: BECAUSE THERE WAS CONTROL MORTALITY, AND NONE OF THE LOWER CONCENTRATIONS PRODUCED ZERO MORTALITY, THE DATA HAS BEEN SUBJECTED TO ABBOTT'S CORRECTION.

LATEULERE NTN 33893 QUAIL LC50

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
4649	9.5	8.5	89.4737	1.381067
2290	9.5	5.5	57.8947	35.35532
1168	9.5	1.5	15.7895	1.381067
567	9.5	3.5	36.8421	17.95387
285	9.5	1.5	15.7895	1.381067
145	9.5	.5	5.2632	.1381067
69	9.5	1.5	15.7895	1.381067

THE BINOMIAL TEST SHOWS THAT 285 AND 4649 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 2033.867

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
4	.3571752	1604.675	918.7774	4024.544

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	
3	.2688752	1	

OODNESS OF FIT PROBABILITY
.2029385

SLOPE = 1.197216
95 PERCENT CONFIDENCE LIMITS = .5764212 AND 1.81801

LC50 = 1535.874
95 PERCENT CONFIDENCE LIMITS = 796.7785 AND 4774.536

LC10 = 133.5245
95 PERCENT CONFIDENCE LIMITS = 15.63936 AND 304.9535

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