12-18-81
MRID000991

(12)

DATA EVALUATION RECORD

1. Chemical: Iprodione (Shaughnessey #109801)

2. Formulation: Technical (95% a.i.)

3. Citation: Beavers, Joann B. and R. Fink. 1981. One - generation study - bobwhite quail - Iprodione technical - Final report. Study by Wildlife International Ltd. dated 3/31/81 and submitted by Rhone-Poulene, Inc. [within Accession #070443]

4. Reviewed by: James D. Felkel
Wildlife Biologist
Ecological Effects Branch/HED

5. Date Reviewed: 12/18/81

6. Test Type: Avian Reproduction

A. Test Species: Bobwhite quail (Colinus virginianus)

7. Reported Results: Adult mortality, not considered compound-related, occurred at all test levels (control, 100 ppm, 300 ppm, 1000 ppm nominal concentrations). Adult behavioral effects were also seen at all test levels. At the 1000 ppm test level, a significant decrease ($p < 0.05$) in eggs laid and hatchling body weight occurred; a significant decrease ($p < 0.01$) in percent of hatchlings of eggs set was also observed at this level. A "no effect" level of of 300 ppm was cited.

8. Reviewer's Conclusions: The study is scientifically sound and meets the intent of proposed subpart E guidelines (7/10/78). Adult behavioral effects and mortality were reported at all test levels. The only reproductive impairment that could be confirmed was the significant decrease ($p < 0.05$) in hatchling body weight at the 1000 ppm nominal test level (871-1001 ppm "uncorrected" measured concentration).

Materials/Methods Reported (Summary)

Pen-reared bobwhite quail, disease - free and previously untreated, were obtained form the production flock at Wildlife International Ltd., St. Michaels, Maryland. They were 6 months old at the initiation of the study (i.e., approaching their first breeding season). 144 quail were randomly distributed into the following groups:

Group No.	Concentration (ppm)	No. pens
1 - Control	0	12
2 - Iprodione Tech.	100	12
3 - " "	300	12
4 - " "	1000	12

Each pen contained one cock and two hens. The photoperiod for the first six weeks of the study was eight hours of light per day and increased to 17 hours of light per day for the remainder of the study. Adults received water and the appropriate diet ad libitum.

All adult birds were observed daily and a record maintained of all mortalities, signs of toxicity, and abnormal behavior. Body weights were recorded at initiation, weeks 2, 4, 6, 8, and termination, but not during egg-laying. Weekly, during egg-laying, one egg from every other pen was randomly selected for egg weight and eggshell thickness measurement. Feed consumption was measured every 2 weeks. Eggs were collected daily, marked, and then stored at 56.0°F ± 1.5°F and 85% relative humidity. Weekly, the eggs were placed in an incubator. Prior to incubation, all eggs were candled to detect cracks and all eggs to be set were fumigated with formuladehyde gas to reduce any pathogen contamination; on day 11 of incubation, embryo viability was measured; on day 21, embryo survival was determined and eggs were placed in a hatcher; on day 25, all hatchlings, unhatched eggs, and eggshells were removed and the average body weight of representative hatchlings determined. Forty hatchlings from each week lot were randomly chosen for rearing. When the number of hatchlings in a given week lot was less than 40, all hatchlings were reared. Hatchlings were housed in battery brooders until 14 days old.

An incubation temperature of 99.5°F ± 0.1°F and wet bulb humidity index of 86.0°F ± 1.0°F were maintained; eggs were rotated automatically. Hatcher temperature was 99.1°F ± 0.2°F and the wet bulb humidity index was 87.0°F ± 2.0°F. Brooder temperature was 100.0°F from hatching to day 14 of brooding. Starter ration and water were available ad libitum for hatchlings. They were weighed at 14 days of age.

Statistical Analysis Reported (Summary)

Analysis of Variance was used to evaluate body weight and other "measurement" variables. "Count" variables were subjected to an analysis based on Cochran's concept of extraneous variability for the binomial distribution.

Results Reported (Summary)

Adult mortalities were as follows: 3 hens of control group; 2 hens of 100 ppm group; 1 hen of 300 ppm group; and 3 hens of 1000 ppm groups. All mortalities occurred during the stress of egg production or were cannibalistic in nature. In all instances, no gross compound related abnormalities were noted upon necropsy. Therefore, these deaths are considered to be incidental and not compound related [gross pathological observations table attached]

Behavioral observations of adults not dying included:

Control - 1 hen with lacerated scalp;

100 ppm - 1 cock with lesions of toe picking;

300 ppm - 1 hen with lesions of head picking, scalp lacerations, and toe picked; 1 cock with scalp lacerations and lethargy; 1 hen with lesions of head picking depression, reduced reaction to external stimuli, wing droop, and ruffled appearance; 1 hen with lesions of toe picking.

1000 ppm - 1 cock and 1 hen in same pen with scalp lesions and lethargy or depression; 1 cock with bruised head; 1 hen with scalp lacerations, lesions of nostril picking, and lethargy; 1 cock with lesions of toe picking, wing droop, ruffled appearance, and breast lesions; 1 cock with lesions of toe picking; 1 hen with scalp lacerations.

There was no statistically significant effect on adult average body weight at any test level. Average adult feed consumption was comparable to controls at all test levels.

The average percentage of cracked eggs among control and test groups was 16%. Approximately 50% of the cracked eggs resulted from mechnical breakage (human handling or pecking by the birds). Mean eggshell thickness in treatment groups was greater than or equal to controls.

No statistically significant reproductive impairment was seen at the 100 ppm or 300 ppm test levels. At the 1000 ppm test level, a significant ($p < 0.05$) decrease in eggs laid (524 vs. 692 in controls) and hatchling body weight (6.0 g. vs. 6.3 g. mean weight in control) occurred; a significant ($p < 0.01$) decrease in percent of hatchlings of eggs set was also observed. A "no effect" level was thus reported to be 300 ppm under the avian reproduction study conditions. [Reproduction Summary Tables attached]

Appendices report "found (uncorrected)" toxicant concentrations as follows for the bobwhite feed:

Nominal	Found (uncorrected)
control	none detected
100 ppm	105 - 149 ppm
300 ppm	278 - 400 ppm
1000 ppm	871 - 1001.0 ppm

3

Reviewer's Analysis

Procedures and statistical analyses were generally consistent with proposed subpart E guidelines (7/10/78).

As an intial screen to check the reported results, a chi-square analysis was conducted that examines the entire set of reproductive data at once (i.e., the sums of values for each reproductive parameter at each test level). This analysis, with designated computer file name of "SUPER", is considered more sensitive than ARSIN analysis (R. Balcomb, personal communication) However, since at present this analysis does not take between-pen variation into account, differences detected must be confirmed by ARSIN.

Using the SUPER program, no significant overall impairment ($p > 0.05$) was seen, across all reproductive parameters (from eggs laid to adjusted 14-day old survivors), at any test level. The only overall significant difference ($p < 0.05$), relative to controls, was at the 300 ppm nominal test level where reproductive success was approximately the same or better than controls at all individual parameters. The values for total 14-day old survivors had to be adjusted (14-day old survivors/ hatchlings reared X normal hatchlings) since not all normal hatchlings were reared.

While no overall significant difference, relative to controls ($p > 0.05$), was seen at the 1000 ppm nominal test level, significant impairment ($p < 0.05$) was detected at two individual parameters: viable embryos of eggs set and normal hatchlings of live 3-week embryos. However, neither of these differences could be confirmed with ARSIN analysis ($p > 0.05$).

Pen-by-pen numbers of eggs laid were examined by ANOVA. While significant differences among the means were detected ($p = 0.0343$), none of the treatment groups (including the 1000 ppm nominal test level where fewer eggs were laid than in the controls) were significantly different from controls (Duncan's Multiple Range Test for Variable Response, $p > 0.05$). Raw numbers of 14-day old survivors could not be properly analyzed using ANOVA since not all normal hatchlings were reared. ANOVA with Duncan's Multiple Range Test confirmed that hatchling body weight (by week lot) in the 1000 ppm treatment group was significantly different from controls ($p < 0.05$).

In sum, significant impairment ($p < 0.05$) relative to controls, could only be confirmed for hatchling body weight at the 1000 ppm test level.

Conclusions

1. Category: Core

2. Rationale: Study meets intent of proposed subpart E guidelnes (7/10/78).

3. Repairability: N/A