(6-15-93)

Carbendazim is a degradate of Benomyl MRID No. 154667-01

DATA EVALUATION RECORD

1. **CHEMICAL:** Benomyl. ✓ in Benomyl
Shaughnessey No. 099101.

2. **TEST MATERIAL:** H-15,607; >99% active ingredient; an off-white powder.

3. **STUDY TYPE:** 71-1A. Avian Single Dose Oral LD_{50} Test. Species Tested: Bobwhite quail (*Colinus virginianus*).

4. **CITATION:** Beavers, J.B. and M. Jaber. 1985. An Acute Oral Toxicity Study in the Bobwhite with H-15,607. Project No. 112-163. Performed by Wildlife International Ltd., St. Michaels, MD. Submitted by E.I. du Pont de Nemours & Company, Newark, DE. EPA MRID No. 154667-01.

5. **REVIEWED BY:**

Mark A. Mossler, M.S. **Signature:**
Associate Scientist
KBN Engineering and **Date:** 6/15/93
Applied Sciences, Inc.

6. **APPROVED BY:**

Michael L. Whitten, M.S. **Signature:**
Wildlife Toxicologist
KBN Engineering and **Date:**
Applied Sciences, Inc.

Henry T. Craven, M.S. **Signature:**
Supervisor, EEB/EFED
USEPA **Date:**

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the requirements for an acute oral toxicity test using bobwhite quail. The 14-day LD_{50} value of >2250 mg/kg classifies H-15,607 as practically non-toxic to bobwhite quail. The NOEL was 486 mg/kg.

8. **RECOMMENDATIONS:** N/A.

9. **BACKGROUND:**

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

Benomyl

5.5 hrs

✓

11. MATERIALS AND METHODS:

A. Test Animals: The birds used in the study were 6-month-old bobwhite quail (*Colinus virginianus*) obtained from a supplier in Phillipsburg, NJ. The birds were pen-reared and phenotypically indistinguishable from wild birds. They were acclimated to the laboratory for at least 14 days prior to testing. Except for a 15-hour fasting period immediately prior to dosing, water and a game bird ration were offered *ad libitum* during acclimation and testing.

B. Test System: All birds were housed indoors in pens constructed of galvanized wire and galvanized sheeting (side walls). The pen dimensions were 78 x 51 x 23 cm. Fluorescent lights provided 8 hours of 12-footcandle illumination per day. The average temperature was 71 ±4°F and the average relative humidity was 64%.

C. Dosage: Fourteen-day single dose oral LD_{50} test. Five nominal dosage levels (292, 486, 810, 1350, and 2250 mg/kg of body weight) and a diluent (corn oil) control were selected for the test. The dosages were not corrected for the percent active ingredient of the test substance.

D. Design: Groups of ten birds (five males and five females) were assigned to each treatment and control group by random draw. Each dosage group was assigned two pens in which the birds were segregated by sex.

The test substance was dispersed in corn oil and intubated directly into the crop or proventriculus 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. Each bird received a constant dosage volume per kilogram of body weight.

All birds were observed daily during testing for mortality, signs of toxicity, and abnormal behavior. The birds were individually weighed at test initiation and by group on days 3, 7, and 14. Group food consumption was determined for days 0-3, 4-7, and 8-14 by measuring the change in feed presented to the birds over a period of time. However, this is an estimate due to wastage by the birds.

E. **Statistics:** The LD_{50} was determined by visual inspection of the data.

12. **REPORTED RESULTS:** There were no mortalities in the control group. All birds were normal in appearance and behavior.

There were no mortalities in the treatment groups and no signs of toxicity were observed at the 292, 486, and 1350 mg/kg treatment levels.

At the 810 and 2250 mg/kg levels, one hen each was noted as having a ruffled appearance 1.5 and 2.5 hours after dosing, respectively. Both hens appeared normal after day 1. All other birds were normal in appearance and behavior.

There was a reduction in body weight gain among males at the 2250 mg/kg level for days 0-3 (Table 3, attached).

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:** The acute oral LD_{50} value for bobwhite quail exposed to H-15,607 was determined to be greater than 2250 mg/kg. The no mortality level was also greater than 2250 mg/kg.

A Quality Assurance statement was included in the report indicating compliance with Good Laboratory Practices as set forth in the Federal Register (1983).

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:

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

Group body weights, rather than individual body weights, were taken on days 3, 7, and 14.

B. **Statistical Analysis:** Upon review of the mortality data, the reviewer concurs that the LD_{50} is greater than 2250 mg/kg.

C. **Discussion/Results:** Upon review of the body weight and feed consumption data, the reviewer determined that the no-observed-effect level (NOEL) was 1350 mg/kg based on a reduction in body weight gain among males at the highest dosage level for days 0-3. However, since a

hen was noted as having a ruffled appearance at the 810 mg/kg level, the NOEL is 486 mg/kg.

This study is scientifically sound and fulfills the requirements for an acute oral toxicity test using bobwhite quail. The LD_{50} value of >2250 mg/kg classifies H-15,607 as practically non-toxic to bobwhite quail. The NOEL was determined to be 486 mg/kg.

D. **Adequacy of the Study:**

(1) **Classification:** Core.

(2) **Rationale:** N/A.

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

15. **COMPLETION OF ONE-LINER:** Yes, 5-27-93.

Ecological Effects Branch One-Liner Data Entry Form

Chemical Benomyl **Shaughnessy No.** Not listed **Pesticide Use** Fungicide

AVIAN ORAL TOX SPECIES (AGE)	% AI	LD_{50} (95%CL)	SLOPE	NOEL	STUDY/REVIEW DATES	MRID/ CATEGORY	LAB	RC
1. Colinus virginianus (6 months)	>99%	>2250 mg/kg (N/A*)	N/A*	486 mg/kg	1985/1993	# 154667-01 Core	WIL	MRR
2.								
3.								
4.								
5.								

AVIAN DIETARY SPECIES (AGE)	% AI	LC_{50} (95%CL)	SLOPE	NOEL	STUDY/REVIEW DATES	MRID/ CATEGORY	LAB	RC
1.								
2.								
3.								
4.								
5.								

COMMENTS: *N/A = not applicable

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TABLE 3

AVERAGE BODY WEIGHT AND ESTIMATED FEED CONSUMPTION OF BOBWHITE

GAVAGED WITH H-15,607

Dosage mg/kg		Average Body Weight in Grams							Estimated Feed Consumption Grams/Bird/Day		
		Day 0	Change	Day 3	Change	Day 7	Change	Day 14	Total Change	Days 0-3	Days 4-7	Days 8-14
Control	M	186	+6	192	+5	197	-3	194	+ 8	13	14	12
	F	193	+6	199	+4	203	-1	202	+ 9	13	14	13
292	M	200	+9	209	+5	214	-2	212	+12	16	15	13
	F	194	+7	201	+3	204	0	204	+10	12	14	12
486	M	200	+7	207	+4	211	+3	214	+14	13	15	14
	F	200	+7	207	+1	208	+3	211	+11	13	15	13
810	M	185	+7	192	+3	195	+3	198	+13	15	19	17
	F	194	+6	200	+1	201	+4	205	+11	15	15	14
1350	M	203	+4	207	+6	213	+4	217	+14	12	16	15
	F	189	+4	193	+6	199	+5	204	+15	24	16	16
2250	M	187	+1	188	+8	196	+2	198	+11	12	19	15
	F	197	+4	201	+4	205	+6	211	+14	10	16	14