Data Evaluation Report on the acute dietary toxicity of BAS 510 F (TGAI) to avian species Bobwhite Quail *(Colinus virginianus)*

PMRA Submission Number 2001-1027 **EPA MRID Number 454049-23**

Data Requirement: PMRA DATA CODE: 9.6.2.4;
EPA DP Barcode: D278418
OECD Data Point: IIA 8.1.2
EPA Guideline: 71-2(a), 850.2200

Test material: BAS 510 F **Purity (%):** 95.3%
Common name: Nicobifen
Chemical name
IUPAC: 2-chloro-N-(4'-chlororobiphenyl-2-yl) nicotinamide
CAS name: 3-Pyridinecarboxamide, 2-chloro-N_(4'-chloro[1.1'-biphenyl]-2-yl)
CAS No.: 188425-85-6
Synonyms:

Primary Reviewer: Peter Takacs and Peter Delorme **Date:** April 22/02
{PMRA}

Secondary Reviewer(s): John Ravenscroft **Date:** June 19, 2002
{EPA}

Company Code: BAZ
Active Code: CHH-BAZ-4
Use Site Category: In Canada, this fungicide is proposed for use on USC 13, 14 and 30; agricultural feed, food and turf uses. BAS 510 F is to be used 2-6 times per growing season depending on the crop, at a maximum recommended application rate of 875 g a.i./ha/application.
EPA PC Code: 128008

CITATION: Dr. S. Zok , 1999. BAS 510 F – Avian Dietary LC50 Test In Chicks of the Bobwhite Quail *(Colinus virginianus)* BASF Aktiengesellschaft Department of Toxicology 67056 Ludwigshafen/Rhein, Germany. Project No. 31W0179/97042.

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EXECUTIVE SUMMARY:

The acute dietary toxicity of BAS 510 F to 14-d-old Bobwhite Quail *(Colinus virginianus)* was assessed over 8 days in accordance with the EPA-540/9-85-008 of June 1985 and OECD 205 guidelines. BAS 510 F was administered to the birds (10/dose) in the diet at 0, 313; 625; 1,250; 2,500 and 5,000 mg a.i/kg dw of diet. The 8 day acute dietary LC_{50} was > 5000 mg a.i/kg dw of diet. The 8 day NOEC of BAS 510 F based on survival and body weight was 5000 mg a.i/kg dw of diet. According to the US EPA classification, BAS 510 F would be classified as practically non toxic to Bobwhite Quail on an acute dietary basis.

There was no mortality in any of the treatment groups during the 8 day study. Also, no sublethal effects were noted. However, the study did not meet some important guideline requirements which are judged to be major deficiencies.

This toxicity study is classified as supplemental and does not satisfy the guideline requirement for avian acute dietary study.

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED:

(U.S.) Environmental Protection Agency, Washington, D.C.: "Pesticide Assessment Guidelines, Subdivision E, Hazard Evaluation Wildlife and Aquatic Organisms"; PB 83-1 53908, Oct. 1982; !j 71-2; "Avian dietary LC,, test", EPA-SEP (= Standard Evaluation Procedure), (U.S.) EPA-540/9-85-008 of June 1985 and OECD 205, adopted April 4, 1984.

COMPLIANCE:

This study was conducted in accordance with the GLP provision of the "Chemikaliengesetz" (Chemical Act; "Bundesgesetzblatt Jahrgang 1994, Teil I, 29.07.1994"; FR Germany) and with the "OECD Principles of Good Laboratory Practice" (Paris, 1981).

A. MATERIALS:

1. Test Material BAS 510 F

Description: Solid powder
Lot No./Batch No. : N 26
Purity: 95.3%
Stability of Compound: Stable in feed for the duration of the test
Storage conditions of test chemicals: ambient conditions

Physicochemical properties of BAS 510 F.

Parameter	Values	Comments
Water solubility at 20°C	4.69 mg/L	low solubility
Vapour pressure	$7x10^{-9}$ mbar @ 20 °C	not volatile
UV absorption	UV molecular extinction: $1.53x10^{3}$ at 290 nm	-
pKa	does not dissociate in water	-
Kow	2.96	Not likely to bioconcentrate

2. **Test organism**:

Species (common and scientific names): Bobwhite quail (*Colinus virginianus*),
Age at study initiation: 14 days
Weight at study initiation: 23.0 ± 2.4 g
Source: BASF Aktiengesellschaft, Department of Toxicology; reared from eggs laid by parent birds supplied by Morris Quail Farm Inc., 18370 S.W. 232 Street, Goulds, Florida 33170-5399, USA

B. STUDY DESIGN:

1. Experimental Conditions

a) Range-finding Study:

b) Definitive Study

Table 1: Experimental Parameters

Parameter	Details	Remarks *Criteria*
Acclimation Period: Conditions (same as test or not): Feeding: Health (any mortality observed):	14 days in test conditions, fed *ad lib.* Health was checked at initiation of test	acceptable *OECD requires at least 7 days of acclimation*
Pen size and construction materials	Stainless sheet steel cages (520 x 350 x 490 mm; floor area 0.18 m^2) with grid flooring (stainless steel; mesh size 7 x 7 mm); 10 birds per pen. **These cages may be too small and could cause stress due to crowding in bobwhites.**	**Floor area not acceptable, EPA and OECD requires at least 300 cm^2/bird** *EPA requires: about 35 x 100 x 24 cm; OECD requires: 300 cm^2 for bobwhite and 600 cm^2 for mallard*

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Parameter	Details	Remarks *Criteria*
Test duration	5 days of treated feed exposure followed by 3 days of observation.	acceptable *EPA/OECD requires: 5 days with treated feed and at least 3 days observation with "clean" feed.*
Test concentrations Nominal: Measured:	0 (= Control); 313; 625; 1,250; 2,500 and 5,000 mg/kg diet (corrected for test material purity = 95.3%) 97-110% of nominal	acceptable *Four minimum, 5 or 6 strongly recommended, in a geometric scale, unless LC_{50} > 5000 mg ai/kg diet.* Measured conc. should be 80% of the nominal
vehicle, if used Type: Amount:	none	acceptable *EPA requires: Distilled water, corn oil, propylene glycol, 1% carboxymethylcellulose, or gum arabic. Solvent not more than 2%.*
Diet preparation and feeding	"Ssniff* experimental diet, special mixture in meal form for quails and chicks with the following composition (Weender analysis):	acceptable *EPA requires: Control group tested with diet containing the maximum amount of vehicle used in treated diets*
Was detailed description and nutrient analysis of the basal diet provided (Yes/No)	yes	
Indicate whether stability and homogeneity of test material in diet determined (Yes/No)	yes	
Feed withholding period	not stated	

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Parameter	Details	Remarks *Criteria*
Number of birds per replicate/groups For negative control: For treated:	 10 10 **EPA requires 20 birds per control group**	**not acceptable** *EPA (OPPTS 850.2200) requires: 10 birds minimum for each treatment group, and 20 birds minimum for the control group(s).*
Number of replicates/group (if used) For negative control: For treated:	no replicates were used	
Test conditions Temperature: Relative humidity (%): Photoperiod:	Generally about 20˚C ± 2 in the test room; in addition, an area with a higher temperature was maintained by ceramic radiant heaters.(type IOT; not emitting visible light) above the cages. Thus the chicks could find their optimum conditions themselves. The temperature in the center under the ceramic heaters was about 35 - 37˚C. 50-60% 16 hours light, 8 hours dark; light intensity about 130 Lux in the middle of the cages	acceptable *Brooder temperature:* *EPA: about 35°C (95°F)* *Room temperature:* *EPA: 22-27°C (71-81°F);* *OECD: range of 22-38 °C based on bird age and species (see OECD 205)* *Relative humidity:* *EPA: 30-80%* *OECD: 50-85% based on bird species (see OECD 205)* *Photoperiod:* *EPA: Minimum of 14 h of light* *OECD: 12-16 h of light*
Reference chemical, if used Name: Concentration tested:	-	

2. Observations:

Table 2: Observations

Parameters	Details	Remarks *Criteria*
Parameters measured (mortality/body weight/ mean feed consumption/ others)	mortality, body weight, mean feed consumption, Post-mortem examination	acceptable *OECD : the mortality in the controls should not be exceed 10% at the end of the test.*
Indicate the stability and homogeneity of test chemical in the diet	After 7 days, the concentration of test material in feed was 100.3% of the initial, homogeneity was ensured by mixing before treatment.	
Indicate if the test material was regurgitated	not stated	
Treatments on which necropsies were performed	all birds were examied microscopically	
Observation intervals	daily for mortality and feed consumption, day 0, 5 and 8 for body weight.	
Were raw data included?	Yes	

II. RESULTS AND DISCUSSION:

A. MORTALITY:

No mortality occurred at any treatment concentration during the 8 day study period.

Table 3: Effect of BAS 510 F on mortality of Bobwhite Quail.

Treatment (mg a.i. kg diet) [nominal conc.]	No. of birds per treatment	Cumulative mortality				
		day 1	day 2	day 3	day 4	day 8
Negative control	10	0	0	0	0	0
313	10	0	0	0	0	0
625	10	0	0	0	0	0
1,250	10	0	0	0	0	0
2,500	10	0	0	0	0	0
5,000	10	0	0	0	0	0
LC_{50}	> 5000 mg ai/kg diet					
NOEC	5000 mg ai/kg diet					

B. SUB-LETHAL TOXICITY ENDPOINTS:

No sublethal effects were noted on weight gain, or feed consumption.

Table 4: Sublethal effects of BAS 510 F on of Bobwhite Quail.

Treatment (mg a.i. kg diet) [nominal conc.]	Body weight (g)		Food Consumption (mg/kg)	
	Day 0	Day 8	Day 5	Day 8
Negative control	23	37.8	5.7	5.7
313	23.7	40.9	5.9	6.6
625	22.9	36.6	6.0	5.6
1,250	23.0	40.3	7.5	7.1
2,500	23.0	38.3	6.4	6.2
5,000	23.0	37.4	5.8	6.0
LC_{50}	> 5000 mg ai/kg diet			
NOEC	5000 mg ai/kg diet			

C. REPORTED STATISTICS:

The statistical evaluation of the body weight was performed by one-way analyses (ANOVA) followed by Dunnett's test: "A multiple comparison procedure for comparing several treatments with a control", The statistical evaluation was performed with the computer systems of the Department of Toxicology using the I NSTEM-Toxicology-data system (program TOXREP).

D. VERIFICATION OF STATISTICAL RESULTS BY THE REVIEWER:

Not necessary, due to lack of effects (identical to controls)

E. STUDY DEFICIENCIES:

The cages used in the study (1800 cm^2 floor area, or 180 cm^2/bird) were too small; overcrowding causes undue stress in the test species and can influence the results. The EPA (OPPTS 850.2200) requires at least 300 cm^2/bird for bobwhite quail. The number of birds used in the control group (10) is also not acceptable. EPA requires at least 20 birds per control group. The size of the cages would have precluded using more than 10 birds. These deficiencies are considered to be major deficiencies.

F. REVIEWER'S COMMENTS: Not a well designed study; care was not taken to make sure that important parameters such as number of organisms per control meet the guideline requirements. This would not be an issue if the birds from the reserve group would have been included into the control group instead of being sacrificed at the beginning of the compound feeding period.

G. CONCLUSIONS: The study did not follow critical guideline criteria. However, because no toxic effects (acute or subacute) were seen at any test level, the applicant is not required to repeat the study. The avian oral toxicity data can be used for avian acute risk assessment. This study is classified as supplementary due to lack of apparent toxicity to mallards. However, poor rearing conditions and low control group sample size may have impacted the ability to detect effects, if they occurred.

III. REFERENCES:

Approved 04/01/01 C.K.