

US EPA ARCHIVE DOCUMENT



**Data Evaluation Report on the toxicity of BAS 670 00 H to the carabid beetle, *Poecilus cupreus*.**

**PMRA Submission Number 2003-0839**

**EPA MRID Number 45901818**

**Data Requirement:**

PMRA DATA CODE: 9.2.5 (non-target terrestrial invertebrates - predators)  
EPA DP Barcode: D290076  
OECD Data Point:  
EPA Guideline: OPPTS None; OPP None

**Test material:**

BAS 670 00 H

**Purity (%):** 351.6 g a.i./L (31% a.i.)

**Common name:**

BAS 670 H

**Chemical name:**

**IUPAC:**

[3-(4,5-dihydro-isoaxazol-3-yl)-4-methane-sulfonyl-2-methyl-phenyl]-(5-hydroxy-1-methyl-1H-pyrazol-4-yl)methanone

**CAS name:**

[3-(4,5-dihydro-3-isoxazolyl)-2-methyl-4-(methylsulfonyl)phenyl](5-hydroxy-1-methyl-1H-pyrazol-4-yl)-

**CAS No.:**

210631-61-8

**Synonyms:**


Reg. No. 375080, methanone

**Primary Reviewer (officer number):** 1268  
**PMRA**

**Signature:**

**Date:** September 07, 2004

**Secondary Reviewer:** Stephen Carey, Biologist  
**EPA**

**Signature:**   
**Date:** February 22, 2005

**Company Code:** BAZ  
**Active Code:** MTN  
**Use Site Category:** 14  
**EPA PC Code:** 123009

**CITATION:** Effect of BAS 670 00 H on the carabid beetle *Poecilus cupreus* L. (Coleoptera, Carabidae) in the laboratory. IBACON, Germany. Study No. 7623006. BASF Corp. Registration No. 2001/1000899. Submitted to PMRA on March 31, 2003.



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**EXECUTIVE SUMMARY:**

The effect of BAS 670 00 H (guarantee 351.6 g BAS 670 H/L, equivalent to 31% a.i.) on mortality and sublethal effects of behaviour and food consumption in the carabid beetle (*Poecilus cupreus*) was determined over a 14 day period. BAS 670 00 H was applied at 0 (water control), and 223 mL/ha (or 0 and 78.3 g a.i./ha), which exceeds the recommended label dose rate of 73 mL/ha. The study was conducted according to the protocols of Heimbach (1991) and Heimbach et al. (1999) and done under OECD and Chemikaliengesetz GLP. Adult beetles 2 -3 weeks old were oversprayed with either water, test substance, or toxic standard (positive control [pyrazophos]). Assessed endpoints included beetle mortality, food consumption, and sublethal symptoms. Endpoints were assessed at 1-2 h, and 1, 2, 4, 7, 10, and 14 days after application. No statistical analyses were performed, as no mortality occurred in treatment groups, and food consumption was higher than in control. The following test validity criteria were met: control mortality = 0% (6.7% maximum), and toxic standard mortality = 40% (65 ± 35%).

According to the IOBC classification criteria, BAS 670 00 H can be considered Harmless to *Poecilus cuprea*.

This study is classified as acceptable and satisfies the conditional guideline requirement for an acute toxicity study with a beneficial terrestrial invertebrate predator (PMRA DACO 9.2.5). This study was designed to fulfill the requirements of the Commission Directive 96/12/EC and/or of the 'SETEC - Guidance Document on Regulatory Testing Procedures for Pesticides with Non-target Arthropods' (Barrett *et al.*, 1994). This study does not fulfill any current U.S. EPA guideline. This study provides useful information on the acute toxicity of the end-use product BAS 670 00 H (31% a.i.) to the Carabid Beetle, *Poecilus cupreus* L. (Coleoptera, Carabidae).

**Results Synopsis**

LR<sub>50</sub>: >223 mL/ha (>78.3 g a.i./ha or 0.07 lb ai/A)

NOER (mortality, sub-lethal effects, and food consumption): 223 mL/ha (78.3 g a.i./ha or 0.07 lb ai/A)

Endpoints Effected: none

**I. MATERIALS AND METHODS**

**GUIDELINE FOLLOWED:**

This study was not designed to fulfill any current



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U.S. EPA guideline. This study was designed to comply with methods described by Heimbach (1991); Heimbach et al. (1999) -draft; and recent ring-test protocol, France (1999).

**COMPLIANCE:**

Study conducted according to GLP: OECD (1997) and Chemikaliengesetz der Bundesrepublik Deutschland (ChemG), Anhang 1 (1994/97). Signed and dated GLP, Quality Assurance and a No Data Confidentiality claim were provided.

**1. Test Material**

BAS 670 00 H

**Description:**

grey-beige liquid herbicide

**Lot No./Batch No. :**

2000-1

**Purity:**

336 g a.i./L (nominal)  
351.5 g a.i./L (measured; 31% a.i.)

**Stability of Compound Under Test Conditions:**

The stability of the test substance under the conditions employed in this study was not determined.

**Storage conditions of test chemicals:**

in original container at room temperature (5 - 30°C)

**Density:**

1.134 g/mL

**Table 1. Physicochemical properties of BAS 670 H.**

Parameter	Values	Comments
Water solubility at 20°C	510 mg/L in deionized H <sub>2</sub> O at 20°C >100 g/L at pH >9	Highly soluble





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Parameter	Values	Comments
Vapour pressure	$<1.0 \times 10^{-12}$ mbar (= $<1.01 \times 10^{-10}$ Pa) at 20°C	Low volatility
UV absorption	207 nm: 0.7637 272 nm: 0.2426 300 nm: 0.1636 410 nm: 0.0027	Potential for phototransformation (i.e. absorbance occurring within 285 - 350 nm range)
pKa	4.06 @ 20°C	Dissociated at environmentally relevant pHs
Log Kow	-1.52 @ 20°C	Not likely to bioaccumulate

**2. Test organism:**

**Species:** carabid beetles (*Poecilus cupreus* L.)  
**Age at test initiation:** adults  
**Source:** Bio-Test Labor GmbH, Birkenallee 19, D-18184 Sagerheide.  
**Stage Transported:** 2 - 3 weeks at delivery and test start  
**Cultural Background:** None provided.

**B. STUDY DESIGN:**

**1. Experimental Conditions**

a) Range-finding Study: None performed.

b) Definitive Study



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Table 2 . Experimental Parameters/Design

Parameter	Value	Remarks ----- Criteria
<p><u>Acclimation:</u></p> <p>Duration:</p> <p>Feeding:</p> <p>Water</p> <p>Health of beetles</p>	<p>3 days under test conditions</p> <p>Frozen fly pupae at Day 0, 2, 4, 7 and 10 after application at a rate of 1 pupa per viable beetle</p> <p>At Days 0, 2, 4, 7 and 10</p> <p>Not reported.</p>	<p>O.K.</p> <p>-----</p> <p><i>Heimbach (1992): 2 - 10 week old beetles should be used.</i></p>
<p>Cage - description and size</p>	<p>Exposure cages: plastic boxes (18.3 x 13.6 x 6 cm) containing ~1.5 cm dry quartz sand. Upper parts of boxes painted with Fluon to prevent escapees. Walls of the boxes were not treated with test material.</p>	<p>O.K.</p> <p>-----</p> <p><i>Heimbach (1992):</i> <i>1 L plastic boxes filled with 250 g dry quartz sand, closed with plastic lid with 2 mm mesh. Sand is moistened to 70% of MWHC and walls are painted with Fluon to prevent beetle escape. Walls of the boxes should be protected from spray material at application.</i></p>





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Parameter	Value	Remarks Criteria
<u>Test conditions</u>	Test units held in a ventilated climatic chamber	O.K. ----- <i>Heimbach (1992):</i>  <i>Temp.: 20°C</i> <i>RH: ~85%</i> <i>Light intensity: 500 - 1500 lux</i> <i>Photoperiod: 16 h L: 8 h D</i>
Temperature: acclimatisation: exposure:	20 - 21°C 19 - 22°C	
Humidity: acclimatisation: exposure:	55 - 65% 45 - 85%	
Lighting: acclimatisation: exposure:	1040 - 1200 lux 850 - 1230 lux	
Photoperiod:	16 h L: 8 h D	
<u>Solvent/dispersant control, if used</u>		-----
Name: Concentration:	none.	
Number of predators per test unit	6 per unit (3 m and 3 f)	O.K. ----- <i>Heimbach (1992): 6 beetles per test unit (3 male and 3 female).</i>
<u>Number of replicates per treatment</u>		O.K. ----- <i>Heimbach (1992): 5 replicates per treatment level</i>
Negative control: Solvent/dispersant control, if used: Treated: Positive control:	5 - 5 5	
Doses used Nominal:	0 (negative control), and 223 mL/ha  = 0, and 78.3 g a.i./ha (based on measured purity)	O.K. Proposed field application rate = 25 g a.i./ha  ----- <i>Heimbach (1992): test substance applied directly to beetles and food in test units</i>
Measured:	Not measured.	

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Parameter	Value	Remarks ----- Criteria
Deposition rate	4 mg/cm <sup>2</sup> (corresponding to 400 L spray liquid/ha)	O.K. note that this is double the spray volume used in other trials.  Lab track sprayer used with TeeJet 8002 EVS at 2.5 bar and 1.5 km/h spraying speed.  ----- <i>Heimback (1992): 4 mg/cm<sup>2</sup></i>
Duration of the study	Exposure period: 14 days	O.K.  -----
Indicate other factors, if any		
<u>Reference chemical, if used</u>  Name:  Concentration:	Afugan EC 30 (294 g/L pyrazophos)  1.0 L Afugan EC 30 in 400 L water/ha (corresponding to 2.5 mL Afugan EC 30/L, or 0.74 g/L pyrazophos)	O.K.  ----- <i>Heimback (1992) suggests Afugan EC 30 at 1.0 L/ha (294 g a.i./L pyrazophos).</i>

**2. Observations:**

Table 2: Observations

Parameters	Details	Remarks ----- Criteria
Parameters measured including sublethal effects/toxicity symptoms	-Mortality (no. of living and dead beetles) -Food consumption (no. of fly pupae consumed or untouched) -Other sublethal symptoms (behavioural abnormalities, uncoordinated movements, lying on the back)	O.K.  ----- <i>Heimback (1992) requires &lt;10% mortality in controls</i>







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Parameters	Details	Remarks
		Criteria
Observation intervals	-Mortality: 1 - 2 h, 1, 2, 4, 7, 10 and 14 days -Food consumption: 2, 4, 7, 10 and 14 days -Sublethal symptoms: 1 - 2 h, 1, 2, 4, 7, 10 and 14 days	O.K.  ----- <i>Heimback (1992) requires:</i> -mortality at 2, 6 and 24 h and 2, 4, 7, 10 and 14 days -feeding at 2, 4, 7, 10 and 14 days
Were raw data included?	Yes	
Other observations, if any		

**II. RESULTS AND DISCUSSION:**

**A. MORTALITY:** No mortality of beetles was seen in either the negative controls or BAS 670 00 H treatment. Mortality in the toxic standard reached  $40.0 \pm 19.0\%$  at Day 2 and remained at that level until Day 14. Although low, this is within the range of acceptability (i.e.,  $65 \pm 35\%$ ) cited by the study authors.

**B. SUB-LETHAL TOXICITY EFFECTS:** No behavioural abnormalities in beetles were seen in either the negative controls or BAS 670 00 H treatment. At 24 hours after application  $40.0 \pm 19.0\%$  of beetles in the toxic standard treatment exhibited abnormal behaviours. Food consumption rates increased slightly relative to controls (Table 3).

Table 3: Effect of BAS 670 00 H on food consumption<sup>a</sup> of the predatory beetles.

Time <sup>b</sup>	Test substance (78.3 g a.i./ha)			Control			Toxic standard		
	Avg. pupae/beetle	SD	% of control <sup>c</sup>	Avg. pupae/beetle	SD	% of control <sup>c</sup>	Avg. pupae/beetle	SD	% of control <sup>c</sup>
Days 0 - 7	3	0	100	3	0	-	2.9	0.4	96.3
Days 7 - 14	2	0	103.4	1.9	0.1	-	1.5	0.8	77.6
Days 0 - 14	5	0	101.4	4.9	0.1	-	4.4	1.2	89

<sup>a</sup> Tabulated results represent rounded results calculated on the exact raw data

<sup>b</sup> Time period after application

<sup>c</sup> Compared with the control, calculated with exact data



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**C. REPORTED STATISTICS:**

No statistical procedures were performed because no mortality occurred in the test item groups and food consumption was marginally higher compared to controls.

**D. VERIFICATION OF STATISTICAL RESULTS BY THE REVIEWER:**

The reviewer agrees that no statistics were required to analyze these data. According to Heimbach (1992),

if mortality or food consumption is:

≤ 29%, then IOBC Class 1

≥ 30% to <80%, then IOBC Class 2

≥ 80% to 99%, then IOBC Class 3

>99%, then IOBC Class 4

Therefore, the effects of BAS 670 00 H at concentrations up to 78.3 g a.i./ha can be classified as Harmless (Class 1).

**E. STUDY DEFICIENCIES:**

None identified.

**F. REVIEWER'S COMMENTS:**

The actual application rate was not verified (only nominal value was reported), and the stability of BAS 670 H (a.i.) was not assessed under actual use conditions during the exposure period.

**G. CONCLUSIONS:**

This study is acceptable, and satisfies the Canadian guideline requirement for conditionally required data under DACO 9.2.5. The USEPA concludes this study is scientifically sound; however, it was not designed to fulfill any current U.S. EPA FIFRA guideline. This study provides useful information on the acute toxicity of BAS 670 00 H (containing 31% a.i.) to the Carabid Beetle, *Poecilus cupreus* L. Exposure of predatory carabid beetles (*Poecilus cupreus*) to BAS 670 00 H at nominal concentrations of up to 78.3 g a.i./ha did not result in any mortality or sublethal effects. According to the classification scheme of the IOBC (Heimbach 1992), the effects of BAS 670 00 H at concentrations up to 78.3 g a.i./ha can be classified as Harmless (Class 1) to *Poecilus cupreus*.



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**III. REFERENCES:**

Heimbach, U. 1991. Auswirkung von Pflanzenschutzmitteln auf Imagines von *Poecilus cupreus* L. als Vertreter der Familie der Carabidae (= Laufkäfer) im Laboratorium. Biol. Bundesanstalt f. Landund Forstwirtschaft, Richtlinie für die Prüfung von Pflanzenschutzmitteln im Zulassungsverfahren, Teil VI, 23-2.1.8.

Heimbach, U. 1992. Laboratory method to test effects of pesticides on *Poecilus cupreus* (Coleoptera, Carabidae). IOBC/WPRS Bulletin 1992/XV.

Heimbach, U., P. Dohmen, K. Brown, M.J.M. Coulson, N. Halsall, R. Kleiner, J. Rombke, S. Schmitzer, A. Ufer, and H. Wilhelmy. 1999. Method for testing effects of plant protection products on the carabid beetle *Poecilus cupreus* (Coleoptera, Carabidae) under laboratory, extended laboratory and field conditions. DRAFT.

Approved 04/01/01 C.K.

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