File Copy
Chlorsulfuron
Honey Bee DER
141-1

MAY 22 1992

D172769
DPBARCODE (RECORD)
118601
SHAUGHNESSY NO

REVIEW NO.

EEB REVIEW

DATE IN: 01-13-92 OUT: 05-22-92

CASE # : 819491
SUBMISSION # : S409209
ID # : 118601

REREG CASE #:
LIST A, B, C, D

DATE OF SUBMISSION 12-16-91

DATE RECEIVED BY EFED 01-07-92

SRRD/RD REQUESTED COMPLETION DATE 03-15-92

EEB ESTIMATED COMPLETION DATE 03-15-92

SRRD/RD **ACTION** CODE/TYPE OF REVIEW 627 - Generic Data

MRID #(S) 421299-02

DP **TYPE** 001 - Submission Related Data package

PRODUCT MANAGER, NO. W. Waldrop (71)

PRODUCT NAME(S) Chlorsulfuron

TYPE PRODUCT F R I N H D Herbicide

COMPANY NAME Du Pont

SUBMISSION PURPOSE Review data: honey bee acute study

INCLUDE USE(S)

COMMON CHEMICAL NAME Chlorsulfuron

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

May 8, 1992

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

MEMORANDUM

SUBJECT: Chlorsulfuron Data Evaluation Record:
Reregistration Follow-up (D172769; 819491; S409209)

FROM: Doug Urban, Acting Chief
Ecological Effects Branch
Environmental Fate and Effects Division (H7507C)

TO: Walter Waldrop, PM 71
Reregistration Branch
Special Review and Reregistration Division (H7508W)

DuPont has submitted a honey bee acute study (MRID 421299-02) in support of reregistration for Chorsulfuron. The study is classified as core, and fulfills the data requirement for a non-target insect acute contact LD_{50} study (Guideline 141-1). With an LD_{50} of >25 ug/bee, the chemical is considered to be relatively non-toxic to honeybees. The NOEL was ~~1.6~~ 25 ug/bee. KV 12/16/92

Based on a review of the EEB files and the registration standard for products containing chlorsulfuron, the following data requirements are still outstanding:

71-4a: Avian reproduction (TGAI) with waterfowl species
71-4b: Avian reproduction (TGAI) with gamebird species
72-3b: Estaurine/marine mollusc acute (TGAI)
72-4b: Aquatic invertebrate life-cycle (TGAI)
123-1a: Tier II seed germination/seedling emergence (TGAI)
123-1b: Tier II vegetative vigor (TGAI)
123-2: Tier II aquatic plant growth (TGAI)

The following data requirements are reserved for chlorsulfuron:

71-5: Terrestrial field testing (TEP)
72-5: Fish life cycle (TGAI)
72-6: Aquatic organism accumulation (TGAI)
72-7: Aquatic field testing (TEP)
124-1: Terrestrial plant field testing (TEP)
124-2: Aquatic plant field testing (TEP)

If you have any questions on the above, please feel free to contact Kathryn Valente (308-2804).

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DATA EVALUATION RECORD

1. **CHEMICAL:** Chlorsulfuron.
Shaughnessey No. 118601.

2. **TEST MATERIAL:** H #18,053 (Chlorsulfuron); 2-chloro-N-[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)-amino]carbonyl]-benzenesulfonamide; Lot No. 12-51; Batch No. 12-51-88; 98.2% purity; an off-white powder.

3. **STUDY TYPE:** Acute Contact LD_{50} Test. Species Tested: Honey Bee (*Apis mellifera*).

4. **CITATION:** Hoxter, K.A. and S.P. Lynn. 1991. H #18,053: An Acute Contact Toxicity Study with the Honey Bee. Laboratory Project No. 112-260. Conducted by Wildlife International Ltd., Easton, MD. Submitted by E.I. du Pont de Nemours and Company, Newark, DE. MRID No. 421299-02.

5. **REVIEWED BY:**

Kathryn F. Valente, M.S. **Signature:** Kathryn F. Valente
Biologist
Ecological Effects Branch **Date:** 5/12/92
Environmental Fate and Effects Division

6. **APPROVED BY:**

Allen Vaughan **Signature:** Allen W. Vaughan
Acting Head, Section 2
Ecological Effects Branch **Date:** 5.21.92
Environmental Fate and Effects Division

Henry T. Craven, M.S. **Signature:** H.T. Craven 5/12/92
Head, Section 4
Ecological Effects Branch **Date:**
Environmental Fate and Effects Division

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the requirements for an acute contact study with the honey bee. A 48-hour LD_{50} of >25 µg/bee classifies chlorsulfuron as relatively non-toxic to honey bees (*Apis mellifera*). The NOEL was determined to be 1.6 µg/bee.

8. **RECOMMENDATIONS:** N/A. 25 KFV 12/14/92

9. **BACKGROUND:**

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DATA EVALUATION RECORD

1. **CHEMICAL:** Chlorsulfuron.
Shaughnessey No. 118601.

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5. **REVIEWED BY:**

Mark A. Mossler, M.S.
Associate Scientist
KBN Engineering and
Applied Sciences, Inc.

Signature:

Date: 4/27/92

6. **APPROVED BY:**

Pim Kosalwat, Ph.D.
Senior Scientist
KBN Engineering and
Applied Sciences, Inc.

Signature: P. Kosalwat

Date: 4/29/92

Henry T. Craven, M.S.
Supervisor, EEB/EFED
USEPA

Signature:

Date: Henry T. Craven 5/11/92

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the requirements for an acute contact study with the honey bee. A 48-hour LD_{50} of >25 µg/bee classifies chlorsulfuron as relatively non-toxic to honey bees (*Apis mellifera*). The NOEL was determined to be 25 µg/bee.

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

9. **BACKGROUND:**

A.S.

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10. DISCUSSION OF INDIVIDUAL TESTS: N/A.

11. MATERIALS AND METHODS:

A. Test Animals: Eight days before test initiation, two frames of bee (*Apis mellifera*) pupae were placed in an incubator and the bees were allowed to emerge as adults. The bees were 1 to 8 days old at the initiation of the test.

B. Test System: Bees were contained in one pint rolled paper containers (87 mm in diameter and 85 mm high). Each container was covered with a plastic petri plate in which a 20-ml glass vial containing 50% sugar/water was inserted. This food source was available *ad libitum* throughout the test. A sponge within the chamber was misted daily to increase the humidity. Bees were kept in a test room that was supplied with eight hours of light per day. The temperature was maintained at 23-24°C, and the relative humidity was 62%.

C. Dosage: Forty-eight-hour acute contact test. Five treatment levels representing 1.6, 3.1, 6.3, 12.5, and 25 µg/bee were tested along with a solvent control (2 µl acetone/bee) and a negative control.

An appropriate amount of the test material was dissolved in 10 ml of acetone to prepare the dosing solutions. The doses were not corrected for the purity of the test substance (98.2%).

D. Design: Two replicates of 25 bees each were used for each treatment and the controls. Twenty-five randomly selected bees were immobilized with nitrogen and laid out on paper. The bees were dosed individually on the thorax and/or abdomen with 2 µl of test solution. Negative control bees were handled identically to treated bees, but were not dosed with any material. Solvent control bees received only acetone. Observations were recorded twice on day 0 and once on day 1 and day 2.

E. Statistics: An LD_{50} value was determined by visual inspection due to the pattern of mortality in this study. The LD_{50} value was used to classify the test substance according to Atkins' toxicity categories. The categories were: highly toxic (less than 2 µg/bee), moderately toxic (greater than or equal to 2 µg/bee but

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less than 11 µg/bee), and relatively nontoxic (greater than or equal to 11 µg/bee).

12. **REPORTED RESULTS:** Cumulative mortalities of the test bees during the 48-hour exposure period are presented in Table 1 (attached). At test termination, negative control and solvent control mortalities were 0 and 4%, respectively. Mortality in the test dosages ranged between 0 and 8%. These mortalities did not follow a concentration-response pattern and were not considered treatment related. A couple of bees at the 1.6 and 25 µg/bee dosage levels and one bee at the 6.3 µg/bee level were observed as immobile on day 0.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:** Chlorsulfuron was classified as relatively non-toxic according to the toxicity categories of Atkins. The honey bee 48-hour contact LD50 value for chlorsulfuron was determined to be greater than 25 µg/bee. The no-observed-effect dosage (NOED) was <1.6 µg/bee. 25

The study director confirmed that this study was conducted in compliance with Good Laboratory Practice Standards (40 CFR Part 160) with the exception that samples of the dosing solutions were not taken for confirmation of test concentration. A Quality Assurance statement was included in the report.

14. **REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS:**
    - A. **Test Procedure:** The test procedures generally follow the protocols recommended by the SEP and Subdivision L guidelines.
    - B. **Statistical Analysis:** Upon review of the mortality data, the reviewer concurs that the LD_{50} was greater than 25 µg/bee, and that the NOED was <1.6 25 µg/bee.
    - C. **Discussion/Results:** This study is scientifically sound and fulfills the requirements for an acute contact study with the honey bee. A 48-hour LD_{50} of >25 µg/bee classifies chlorsulfuron as relatively non-toxic to honey bees (*Apis mellifera*). The NOED (NOEL) was determined to be <1.6 25 µg/bee.
    - D. **Adequacy of the Study:**
        - (1) **Classification:** Core.
        - (2) **Rationale:** N/A.
        - (3) **Repairability:** N/A.

15. **COMPLETION OF ONE-LINER:** Yes, 4-10-92.

TABLE I
CUMULATIVE MORTALITY OF HONEY BEES
EXPOSED TO H #18,053 FOR 48 HOURS

Experimental Group	Concentration (µg/bee)	Day 0 First Observation Replicate*		Day 0 Second Observation Replicate		Day 1 Replicate		Day 2 Replicate		Replicates Combined	% Mortality
		A	B	A	B	A	B	A	B		
Negative Control	0	0	0	0	0	0	0	0	0	0/50	0
Solvent Control	0	0	0	0	0	0	2	0	2	2/50	4
Treatment	1.6	0(1)	0	0(1)	0(1)	3	1	3	1	4/50	8
	3.1	0	0	0	0	0	0	0	0	0/50	0
	6.3	0	0	0	0(1)	0	2	0	3	3/50	6
	12.5	0	0	0	1	0	1	0	2	2/50	4
	25	0	0	0(1)	0(1)	1	2	1	2	3/50	6

*Each replicate contained 25 bees.

( ) Indicates bees found immobile.

The LD50 value was determined to be greater than 25 µg/bee, the highest dose tested.

Shaughnessey # 118601 Chemical Name Chlorsulfuron Chemical Class _____ Page 1 of 1

Study/Species/Lab/ MRID #	Chemical % a.i.	Results	Reviewer/ Date	Validation Status

48-Hour ~~EC~~ LD$_{50}$	98.2	LD$_{50}$ = > 25 µg/bee* pp (95% C.L. N/A) Control Mortality (%) = 0
		Solvent Control Mortality (%) = 4
		Slope = N/A # Animals/Level = 50
		Temperature = 23-24°C
		48-Hour Dose Level µg/bee* pp /(% Effect)
		1.6 (8), 3.1 (0), 6.3 (6), 12.5 (4), 25 (6)
			M. Hossler 4/10/92	Core

Species: Apis mellifera				
Lab: Wildlife International				
MRID # 421299-02		Comments: * based on nominal doses. ~~NOEL~~ NOEL = 25 µg/bee*		
96-Hour LC$_{50}$		LC$_{50}$ = pp (95% C.L.) Control Mortality (%) = Solvent Control Mortality (%) = Slope = # Animals/Level = Temperature = 96-Hour Dose Level pp /(% Mortality) ( ), ( ), ( ), ( ), ( )		
Species:				
Lab:				
MRID #		Comments:		

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