

DATA EVALUATION RECORD
§ 141-1 - HONEY BEE ACUTE CONTACT AND ORAL LD₅₀ TEST

1. **CHEMICAL:** Mesotrione PC Code No.: 122990

2. **TEST MATERIAL:** ZA1296 Purity: 96.8%

3. **CITATION:**

Authors: D. Jackson and H.J. Gough
Title: ZA1296: Acute Contact and Oral Toxicity to Honey Bees (*Apis mellifera*) of Technical Material

Study Completion Date: October 24, 1995

Laboratory: Jealott's Hill Research Station,
Bracknell, Berkshire, UK

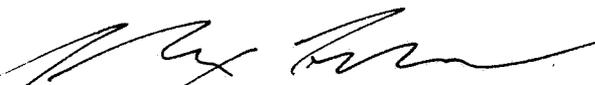
Laboratory Report ID: RJ1959B

Sponsor: ZENECA Ag Products, Wilmington, DE

DP Barcode: D245475

MRID No.: 443735-28

4. **REVIEWED BY:** Max Feken, M.S., Environmental Toxicologist,
Golder Associates Inc.

Signature: 

Date: 8/25/98

APPROVED BY: Pim Kosalwat, Ph.D., Senior Scientist,
Golder Associates Inc.

Signature: P. Kosalwat

Date: 8/25/98

5. **APPROVED BY:** 

Signature:

Date: 6/12/00

6. **STUDY PARAMETERS:**

Scientific Name of Test Organism: *Apis mellifera*

Definitive Study Duration: 48 hours

7. **CONCLUSIONS:** This study is scientifically sound and meets the guideline requirements. Based on the nominal concentrations, the 24-hour acute contact and oral LD₅₀ were greater than 100 and 11 µg ai/bee, respectively, which classifies ZA1296 as relatively non-toxic to the honey bee. The NOELs were determined to be 100 and 11 µg ai/bee, respectively.

PRACTICALLY

B. Test System

Guideline Criteria	Reported Information
Cage size adequate?	Yes
Lighting: Bees should be maintained in the dark.	Held in the dark during testing
Temperature: 27°C (80°F).	22.5 - 23.5°C
Relative humidity: Approx. 65%	42-72% relative humidity

C. Test Design

Guideline Criteria	Reported Information
Range finding test?	Yes, no effects were observed at dosages up to 100 and 11 µg/bee for the contact and oral exposures, respectively.
Reference toxicant tested?	Yes; dimethoate
Method of administration: Whole body exposure in a nontoxic dust diluent; or topical exposure via microapplicator.	Oral and contact (thorax).
Definitive Test Nominal dosages: Sufficient number of dosage levels to yield statistically sound data unless it can be determined that the LD ₅₀ will be greater than 25 µg/bee.	<u>Contact</u> 2, 5, 10, 20, 50, and 100 µg ai/bee <u>Oral</u> 0.5, 1, 2, 5, and 11 µg ai/bee
Controls: Negative control and/or diluent/solvent control	Solvent control for both tests
Number of bees per cage: 25 bees per cage (recommended)	10 bees per cage
Number of cages per group: 3 replicate cages per group is recommended.	3 cages per treatment group

Guideline Criteria	Reported Information
Carrier: Non-toxic dust (e.g., Pyrolite)	N/A
Solvent: Distilled water or the following solvents: dimethyl- formamide, triethylene glycol, methanol, acetone, ethanol.	Acetone
Volume of test solution: ≤2 μl/bee (for contact toxicity tests).	1 μl/bee
Observations period: At least 48 hours.	48 hours

12. REPORTED RESULTS:

Guideline Criteria	Reported Information
Quality assurance and GLP compliance statements were included in the report?	Yes
Controls: Mortality not more than 15%	0% for both (oral and contact) tests.
Raw data included?	Yes
Signs of toxicity (if any) were described?	No signs of toxicity were observed.

Mortality - Contact Test

Dosage ($\mu\text{g ai/bee}$)	No. of Bees	Cumulative Number of Dead	
		Hour of Study	
		24	48
Control	30	0	0
2	30	0	0
5	30	0	0
10	30	0	0
20	30	1	1
50	30	0	0
100	30	0	0

Mortality - Oral Test

Dosage ($\mu\text{g ai/bee}$)	No. of Bees	Cumulative Number of Dead	
		Hour of Study	
		24	48
Control	30	0	0
0.5	30	0	0
1	30	1	10*
2	30	0	0
5	30	0	0
11	30	1	1

*All of the bees from one replicate starved; therefore, this replicate was excluded from the analysis.

Other Significant Results: The 48 h LC_{50} for dimethoate was 0.20 $\mu\text{g ai/bee}$ for the contact test and 0.11 $\mu\text{g ai/bee}$ for the oral test. Both values were within the normal expected limits.

The author states that "preliminary work showed that ZA1296 would not form a stable, homogenous dispersion in 50% w/v aqueous sucrose solution unless it was first dissolved in acetone. Even so, the maximum dose which could be tested was 11 $\mu\text{g ai bee}^{-1}$."

Reported Statistical Results - Acute Contact

Statistical Method: By visual inspection

LD₅₀: >100 µg ai/bee 95% C.I.: N/A

NOEL: 100 µg ai/bee Probit Slope: N/A

Reported Statistical Results - Acute Oral

Statistical Method: By visual inspection

LD₅₀: >11 µg ai/bee 95% C.I.: N/A

NOEL: 11 µg ai/bee Probit Slope: N/A

13. VERIFICATION OF STATISTICAL RESULTS:

Statistical Method (Contact): By visual inspection

LD₅₀: >100 µg ai/bee 95% C.I.: N/A

NOEL: 100 µg ai/bee Probit Slope: N/A

Statistical Method (Oral): By visual inspection

LD₅₀: >11 µg ai/bee 95% C.I.: N/A

NOEL: 11 µg ai/bee Probit Slope: N/A

- 14. REVIEWER'S COMMENTS:** This study is scientifically sound and meets the guideline requirements for a honey bee acute contact and oral toxicity test. Based on nominal concentrations of the dosing solution, the acute contact and oral LD₅₀ were greater than 100 and 11 µg ai/bee, respectively, which classifies ZA1296 as ~~relatively~~ non-toxic to *Apis mellifera*. The NOELs were 100 and 11 µg ai/bee, respectively. This study is classified as **Core**.

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