DATA EVALUATION RECORD

1. Chemical: ~~Neo-Pynamin~~ = Tetramethrin

2. Test Material: Technical, 95.3% ai

3. Study Type: Honey bee acute contact LD50

   Species tested: Apis mellifera

4. Study ID: Hoxter, K. A., G. J. Smith, and M. Jaber. 1990. Neo-Pynamin: An acute contact toxicity study with the honey bee. Wildlife International Ltd. Project No. 166-137. Submitted by Sumitomo Chemical Co., Ltd., Osaka, Japan. EPA Acc. No. 416096-13.

5. Reviewed By:

   Allen W. Vaughan
   Entomologist
   EEB/EFED

   Signature: Allen W. Vaughan
   Date: 2.6.91

6. Approved By

   Norman J. Cook
   Supervisory Biologist
   EEB/EFED

   Signature: Norman J. Cook
   Date: 2.6.91

7. Conclusions:

   This study is scientifically sound, and shows Neo-Pynamin to be highly toxic to honey bees. In an acute contact test, the LD50 was determined to be approximately 0.155 micrograms per bee. This study fulfills the guideline requirement for an acute contact toxicity test on honey bees.

8. Recommendations: N/A

9. Background: This study was submitted in response to a data requirement in the Registration Standard for Neo-Pynamin.

10. Discussion of Individual Tests: N/A

11. Materials and Methods:

Five days prior to initiation of the study, two frames containing honey bee pupae were selected from Wildlife International's hives. The frames were placed in an automatic incubator for five days to allow adult emergence. All test bees were 1 to 5 days old at test initiation, and were apparently healthy. On the day of study initiation, all bees that had emerged were immobilized with N_2 and at least 25 bees were placed into each test chamber.

Test chambers were rolled paper containers. Each container was covered with a plastic petri dish through which a glass vial containing 50% sugar water was inserted. This food source was available to the test bees throughout the study.

The photoperiod was eight hours of light per day. Test temperatures ranged from 22 to 23° C.

Eight treatment levels, 0.0078, 0.0156, 0.0313, 0.0625, 0.125, 0.25, 0.5, and 1 microgram per bee, were tested along with a solvent control and a negative control. Two replicates were tested at each dosage, with 25 bees per replicate. The solvent control bees received a volume of acetone equal to the largest volume used during the test.

Recently collected bees were immobilized with N_2 to facilitate handling. Each bee was individually dosed with the appropriate test solution. Solvent control bees were dosed with acetone.

Observations on mortality and signs of toxicity were made twice on the day of initiation and once on Day 1 and Day 2 after dosing.

Mortality data were analyzed using the computer program of C.E. Stephan. In this study the binomial probability method was used.

12. Reported Results:

The study authors found that Neo-Pynamin was highly toxic to honey bees, with an LD50 of 0.155 ug per bee.

13. Study Authors' Conclusions/ QA Measures

48-hr. LD50 = 0.155 ug per bee (highly toxic).

14. Reviewer's Discussion and Interpretation of the Study

A. Test Procedures: Procedures were in accordance with protocols recommended in the guidelines. There were no problems in this regard.

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B. Statistical Analysis: Independent validation by EEB confirms that the analysis is appropriate and supports the conclusions of the study.

C. Discussion/Results: Neo-Pynamin is highly toxic to honey bees.

D. Adequacy of Study:

1. Classification: Core

2. Rationale: Guidelines protocol

3. Reparability: N/A

15. Completion of One-Liner for Study: N/A

16. CBI Appendix: N/A

NOTE: BECAUSE THERE WAS CONTROL MORTALITY, AND NONE OF THE LOWER CONCENTRATIONS PRODUCED ZERO MORTALITY, THE DATA HAS BEEN SUBJECTED TO ABBOTT'S CORRECTION.

Vaughan Neo-Pynamin Honey Bee Acute

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
1	49	49	100	0
.5	49	48	97.9592	0
.25	49	39	79.5918	0
.125	49	17	34.6939	0
.0625	49	2	4.0816	0
.0313	49	0	0	0 NOEC
.0156	49	3	6.1224	0
.0078	49	2	4.0816	0

THE BINOMIAL TEST SHOWS THAT .125 AND .25 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS .1571195

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
6	2.555713E-02	.157153	.13075	.1911693

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	)ODNESS OF FIT PROBABILITY
5	.8903661	19.87942	)

A PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001.

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 2.493085
95 PERCENT CONFIDENCE LIMITS = .1406295 AND 4.84554

LC50 = .1396131
95 PERCENT CONFIDENCE LIMITS = 1.007935E-02 AND 2.852566

LC10 = 4.320333E-02
95 PERCENT CONFIDENCE LIMITS = 1.310193E-10 AND .1117939

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