DATA EVALUATION RECORD

1. Chemical: PP321 (Karate)

2. Test Material: 1 lb EC formulation

3. Study Type: Honey bee: Toxicity of residues on foliage

   Species Tested: Apis mellifera

4. Study ID: Gough, H.J., and R.A. Brown. 1987. PP321: Toxicity of residues on foliage to honey bees (Apis mellifera). Submitted by ICI Americas Inc., Wilmington, DE. Reg. No. 10182-OA.

5. Reviewed By:

   Allen W. Vaughan
   Entomologist
   EEB/HED

   Signature: Allen W. Vaughan
   Date: 9.13.88

6. Approved By:

   Norman J. Cook
   Supervisory Biologist
   EEB/HED

   Signature: Norman J. Cook
   Date: 9.13.88

7. Conclusions:

   The toxicity of PP321 residues to bees caged onto treated alfalfa foliage for 24 hours decreased with time after application. The LT50 (age of residue lethal to 50% of the bees) of the 0.013 lb ai/acre rate was between 4 and 12 hours, and about 23 hours at 0.031 lb ai/acre. The "NOEL" (time to no-effect) was 24-48 hours for the lower rate and in excess of 96 hours for the higher.

   On the basis of these figures, PP321 is considered highly toxic to honey bees as a foliar residue. This study fulfills the guideline requirement for a foliar residue toxicity test on honey bees.

8. Recommendations: N/A

9. Background: This study was submitted by ICI Americas in support of registration.

10. Discussion of Individual Tests: N/A

11. Materials and Methods

A. Test Animals were worker bees obtained from research colonies.

B. Test System:

General: Bees were collected by sweeping them from the combs into a plastic bucket. Bees were anesthetized by feeding carbon dioxide gas into the bucket. They were then placed in cages and allowed to recover. During the test period, bees were kept in a controlled temperature room at 25-26.5°C and 70% ± 5% R.H.

A field crop of alfalfa was sprayed with an EC formulation of PP321 at rates of 15 and 35 gm ai per ha. Foliage samples were collected after 3, 8, 24, 48, and 96 hours, cut into 50 mm lengths, and placed over a supply of sucrose syrup in exposure cages. On each occasion 50 worker bees were then added to each cage and held for 24 hours before the effects on them were assessed. The study comprised two consecutive tests with differing meteorological conditions during each test.

C. Dose: Exposure to treated foliage.

D. Design: 150 bees per dose level and control, divided into 3 reps.; replicated two times over time. Two dose levels (application rates): 15 and 35 gm ai per ha.

E. Statistics: Estimates of the age of residue lethal to 50% of the bees were obtained by fitting a probit model to the toxicity data.

12. Reported Results: Reported values are listed above under #7, "Conclusions."

13. Study Author's Conclusions/Q.A. Measures:

Reported values are listed above. The values obtained indicate that residues of PP321 may be highly toxic to honey bees, under the conditions of these tests, for as long 96 hours.

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Protocol and final report audits were conducted by ICI's Quality Assurance Unit.

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.

B. Statistical Analysis:

EEB did not attempt to validate the results of the analyses.

C. Discussion/Results:

Residues of PP321 may remain toxic to honey bees for as long as 4 days posttreatment.

D. Adequacy of Study:

1. Classification: Core

2. Rationale: Guidelines protocol

3. Reparability: N/A

15. Completion of One-Liner: N/A

16. CBI Appendix: N/A