

US EPA ARCHIVE DOCUMENT


(6-24-93)

MRID No. 425953-02

DATA EVALUATION RECORD

1. **CHEMICAL:** Cimectacarb.
Shaughnessey No. 112602.
2. **TEST MATERIAL:** CGA 163935 technical (3-cyclohexene-1-carboxylic acid, 3-hydroxy-4-(cyclopropanone)-5-oxo, ethyl ester); CAS No. 95266-40-3; Lot/Batch No. FL900318; 96.6% purity; a red-brown viscous liquid.
3. **STUDY TYPE:** Non-Target Plants: Seedling Emergence Phytotoxicity Test - Tier 2. Species Tested: Cabbage.
4. **CITATION:** Chetram, R.S. 1992. Tier 2 Seedling Emergence Nontarget Phytotoxicity Study Using CGA-163935 Technical. Laboratory Study No. LR90-435. Conducted by Pan-Agricultural Laboratories, Inc., Madera, CA. Submitted by Ciba-Giegy Corporation, Greensboro, NC. EPA MRID No. 425953-02.
5. **REVIEWED BY:**

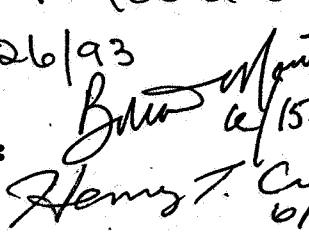
Mark A. Mossler, M.S.
Agronomist
KBN Engineering and
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Signature: 
Date: 5/26/93
6. **APPROVED BY:**

Pim Kosalwat, Ph.D.
Senior Scientist
KBN Engineering and
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Signature: P. Kosalwat
Date: 5/26/93

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

Signature: 
Date: 6/15/93
7. **CONCLUSIONS:** This study was submitted at the request of the EPA that cabbage be retested because of poor control emergence (55%) in the original study (EPA MRID No. 418693-29). This information, once added to the information for the remaining nine test species from the original study, places the entire emergence study (MRID No.s 418693-29 and 425953-02) in the core category.

Seedling Emergence and Survival: The NOEC, LOEC, EC₂₅ and EC₅₀ for cabbage emergence and survival were 0.68, >0.68, >0.68, and >0.68 lb ai/A, respectively.

Plant Phytotoxicity: The NOEC and LOEC, for cabbage phytotoxicity were 0.68 and >0.68 lb ai/A, respectively.

Plant Height and Dry Weight: The NOEC, LOEC, EC₂₅ and EC₅₀ were 0.68, >0.68, >0.68, and >0.68 lb ai/A, respectively.

8. RECOMMENDATIONS: N/A.

9. BACKGROUND:

10. DISCUSSION OF INDIVIDUAL TESTS: N/A.

11. MATERIALS AND METHODS:

A. Test Plants: Dicotyledon plants were represented by one species from one family (i.e., cabbage). Cultivar, lot number, and germination rating were provided in the report.

B. Test System: Ten cabbage seeds were planted at a depth of 1.3 cm in plastic pots (7.5 x 7.5 x 6.0 cm), filled with sterilized sandy loam soil and perlite obtained from the laboratory facility. A plexiglass template was used to create planting holes in the soil, allowing for uniform planting depth and seed distribution. Each treatment replicate was placed on an aluminum tray which was placed in the spray plot (4.9 ft²).

All applications were performed in a spray booth equipped with a single nozzle. A nozzle height of 10.5 inches and a nozzle pressure of 35 psi were used. The highest rate treatment solution was prepared in a 5% acetone/deionized water solution which was diluted serially with the same mixture to achieve the lower rate solutions. The plants were sprayed at the equivalent of 50 gpa of diluent within 55 minutes of solution preparation.

The pots were hand watered (9.5 ml/pot) for the first 48 hours. After this time, the pots were watered four times a day and a total of 13.7 ml of water was used to irrigate each pot per day.

- C. **Dosage:** Cimectacarb was applied at the rates of 0.0213, 0.0425, 0.085, 0.17, 0.34, and 0.68 lb active ingredient (ai)/acre (A).
- D. **Design:** Each crop/treatment combination was replicated four times (i.e., 10 seeds/pot, 4 pots/treatment level). After treatment, the pots were randomized in an on-site greenhouse. Trays were rotated 180° twice weekly to reduce phototropism. The mean temperature was 23 ±0.9°C and the mean relative humidity was 70 ±6.2%.

The percentage of the ten seeds planted in each pot which emerged was calculated for each treatment at 10 and 14 days after treatment. Seedling height and survival were measured 21 days after treatment and phytotoxicity ratings were recorded 10, 14, and 21 days after treatment. Twenty-one days after treatment, the plants within treatment replicates (pots) were cut at the soil level and dried in pre-weighed foil sheets at 100°C for a minimum of 48 hours. After drying, the dry weight of the plant material was recorded.

The phytotoxicity ratings evaluated five observable toxic effects: 0-indicates no effect; 1-indicates slight plant effect; 2-indicates a moderate effect (e.g., mild stunting or chlorosis); 3-indicates a severe effect; 4-indicates a total plant effect; and 5-indicates moribund tissue or plant death.

- E. **Statistics:** All data were entered into a computer spreadsheet. The spreadsheet calculated replicate means, treatment means, standard deviations, and analysis of variance tables. Treatment means were used to calculate the percent effect resulting from the treatment. The percent detrimental effect was calculated using the following equation:

$$\% \text{ effect} = \frac{(\text{treatment mean} - \text{control mean})}{\text{control mean}} \times 100$$

A complete randomized block analysis of variance was performed on the treatment level x replicate means. Treatment level means were subjected to Dunnett's test to determine treatment differences from the control level. A statistical no-effect concentration (NOEC) was the highest treatment level not statistically different from the control or the treatment level which preceded the lowest concentration producing a greater

than 25% inhibition. The significance level for all analyses was at $p < 0.05$.

Percent detrimental effect values were input into a probit analysis program which ignored positive values and transformed the dose by natural logarithms. Probit analysis was conducted using replicate means.

12. **REPORTED RESULTS:**

Percent Emergence and Survival: By the end of 14 days, cabbage emergence at the 0.085 lb ai/A rate was significantly reduced in comparison to the control. However, emergence at the next three higher rates was the same as the control. Therefore, the NOEC was determined to be 0.68 lb ai/A. Due to the lack of a rate response, EC values were not determined.

By the end of 21 days, no significant reductions in survival were noted at any rate tested. The NOEC for cabbage was 0.68 lb ai/A. Again, EC values were not determined due to the lack of treatment effects.

Plant Phytotoxicity: By the end of the 21 day test period, cabbage plants demonstrated no significant signs of phytotoxicity at any rate of cimectacarb tested. The NOEC was 0.68 lb ai/A.

No EC values were computed from the phytotoxicity data.

Plant Height: By the end of 21 days, no significant reductions in height were noted at any rate tested. The NOEC for cabbage was 0.68 lb ai/A. Probit analysis was not conducted due to the lack of significant treatment effects.

Plant Dry Weight: By the end of 21 days, no significant reductions in dry weight were noted at any rate tested. The NOEC for cabbage was 0.68 lb ai/A. Probit analysis was not conducted due to the lack of significant treatment effects.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:**

A no-effect concentration was reached in every parameter measured (percent emergence, percent survival, phytotoxicity rating, plant height, and plant dry weight). The NOEC for each of these parameters was 0.68 lb ai/A.

Statements of Quality Assurance and compliance to Good Laboratory Practice (GLP) Standards (40 CFR Part 160) were included in the report.

14. REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS:

- A. **Test Procedure:** The test procedures followed the SEP and Subdivision J guidelines.
- B. **Statistical Analysis:** Analysis of variance and Dunnett's test were used to analyze cabbage dry weight data (attached). The results were in agreement with those of the author.
- C. **Discussion/Results:** The results are summarized in Table IV (attached). All EC values listed as ND should be considered to be >0.68 lb ai/A.

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This study was submitted at the request of the EPA that cabbage be retested because of poor control emergence (55%) in the original study (EPA MRID No. 418693-29). This information, once added to the information for the remaining nine test species from the original study, places the entire emergence study (MRID No.s 418693-29 and 425953-02) in the core category.

- D. **Adequacy of the Study:**
- (1) **Classification:** Core.
 - (2) **Rationale:** N/A.
 - (3) **Repairability:** N/A.

15. COMPLETION OF ONE-LINER: Yes, 5-25-93.