(UNDATED)

DATA EVALUATION RECORD

STUDY 3

CHEM 112602 Cimectacarb §164-1

FORMULATION--12--EMULSIFIABLE CONCENTRATE (EC)

STUDY ID 41869540
Rice, F., B. Guyton, C. Hallberg, and T. Wiepke. 1991. Terrestrial field dissipation for CGA-163935 2E on turf and bare ground, Illinois site. Project ID: ABC Final Report No. 38641; Ciba-Geigy Protocol No. 69-90. Unpublished study performed by Agri-Growth Research, Inc., Geneseo, IL, and ABC Laboratories, Inc., Columbia, MO; and submitted by Ciba-Geigy Corporation, Greensboro, NC.

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CONCLUSIONS:

Field Dissipation - Terrestrial

1. This study cannot be used to fulfill data requirement and is of uncertain value for the following reason:

   Less than 50% of the application rate was confirmed.

2. Cimectacarb dissipated with a registrant-calculated half-life of 1.1 days from the upper 6 inches of a bareground plot of sandy loam soil, and was not detected in soil (sampled to a depth of 36 inches) of a turf plot of sandy loam soil located near Geneseo, Illinois. The plots were treated with one or two applications of cimectacarb (2 lb

ai/gal EC) at a total nominal application rate of 2.63 or 2.64 lb ai/A. The degradate, 4-(cyclo-propyl-alpha-hydroxy-methylene)-3,5-dioxocyclohexanecarboxylic acid (CGA-179500) was detected to depths of 12 and 24 inches in the bareground and turf plots, respectively (See Tables 3 and 9).

3. For complete fulfillment of the terrestrial field dissipation data requirement, acceptable data applied at the maximum application rate at two field sites are required.

Ancillary Study - Freezer Storage Stability

1. Cimectacarb and CGA-179500 were relatively stable in sandy loam soil from the test site stored frozen for up to 6 months; recoveries averaged 70.8-90.9% for cimectacarb and 77-88.5% for CGA-179500, with no discernible pattern of degradation. Reanalysis of selected sandy loam soil samples fortified at 0.20 ppm with parent or CGA-179500 and stored frozen for 247 days yielded average recoveries of 84.4 and 87.2%, respectively.

2. This study is scientifically sound.

3. No additional data on the stability of cimectacarb in soil samples stored frozen up to 247 days are required at this time. Additional information will be required for samples stored longer than 247 days.

METHODOLOGY:

Field Dissipation - Terrestrial

Cimectacarb (2 lb ai/gal EC, Ciba-Geigy) was applied in one or two broadcast applications with a tractor-mounted sprayer for a total nominal application rate of 2.63 or 2.64 lb ai/A to bareground and turf plots (75 feet x 105 feet) of sandy loam soil (Table 15) located near Geneseo, Illinois. Each treated plot was subdivided into 300 subplots for soil sampling purposes. Untreated bareground and turf plots of sand soil (each 75 feet x 35 feet) that were separated from the corresponding treated bareground and turf plots by a 75-foot wide buffer served as controls; control plots were subdivided into 100 subplots (each 3 feet x 7 feet; Figure 3).

Bareground plot: The bareground plot was treated with a single application of the 2 lb ai/gal EC at 2.63 lb ai/A on June 13, 1990. Soil samples were collected from the treated and untreated plots 1 day prior to and immediately following treatment, and at intervals through 120 days posttreatment. Soil was sampled to a depth of 48 inches from 15 treated and 5 control subplots at each sampling interval.

Soil samples from the 0- to 6-inch soil layer were collected using a zero contamination hand-held probe (0.9-inch id). Additionally, a can was inserted into the soil and the soil removed to a depth of 6 inches; then soil cores were collected from the hole to a depth of 48 inches using a zero contamination hydraulic probe. The 6- to 48-inch soil cores were cut at the 24-inch depth, resulting in a 6- to 24- and 24- to 48-inch soil core for each subplot sampled. The soil cores were capped and stored in a cooler while in the field, then stored frozen until they were shipped overnight on dry ice to the analytical laboratory.

Turf plot: The turf plot was treated with the 2 lb ai/gal EC at a nominal application of 1.32 lb ai/A/application (total of 2.64 lb ai/A) on May 15 and June 13, 1990. The soil samples were collected from the treated and untreated plots as described for the bareground plot soil samples: at 1 day prior to and immediately following each treatment, at 1, 2, 3, 7, 14, and 28 days following the first application, and at intervals through 120 days following the second application. The soil samples were stored in coolers in the field, and shipped to the analytical laboratory as described for the bareground soil samples.

Analytical procedure for soil analyses for all plots: At the analytical laboratory, the 6- to 24- and 24- to 48-inch soil cores were sectioned into 6- to 12-, 12- to 18-, 18- to 24-, 24- to 30-, 30- to 36-, and 36- to 48-inch segments. Soil samples were composited by depth and sampling interval, resulting in three replicate samples for the treated plots and one sample for the control plots. The soil samples were homogenized with dry ice and placed in plastic bags; the dry ice was allowed to sublimate and the samples were stored frozen at -20 C. Maximum frozen storage intervals for samples prior to extraction were 99 days for the bareground soil samples and 242 days for the turf soil samples.

The soil samples were extracted according to ABC Method Number 052190. Subsamples (50 g) of the homogenized soil samples were extracted with a solution of methanol:aqueous phosphate buffer (30:70, v:v) by shaking for 30 minutes. The extract was filtered, the extraction bottles were rinsed with extraction solvent and the rinsate was added to the extracts. The pH was adjusted to 2.8-3.0 with 1.2 M aqueous monobasic potassium phosphate. The extracts were then partitioned three times with methylene chloride. The methylene chloride fractions were combined, an aliquot (1 mL) of a solution of water:methanol:acetic acid (69:30:1, v:v:v) was added, and the sample was evaporated to near dryness by rotary evaporation. The residue was redissolved in water:methanol:acetic acid (69:30:1, v:v:v), and analyzed for cimectacarb and the degradate CGA-179500 by reverse-phase HPLC using a Supelco LC8DB column with a mobile phase of methanol:water:acetic acid:phosphoric acid (450:546:3:1, v:v:v:v) and UV (280 nm) detection. Selected extracts from 0-day soil samples taken from the upper 6 inches of the bareground plot were analyzed by GC/MS to confirm the identity of cimectacarb. Recoveries from soil

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from all sampling depths fortified with cimectacarb or CGA-179500 at 0.0050-0.50 ppm ranged from 51 to 90% and 54 to 166%, respectively; recoveries from soil fortified with cimectacarb at 5.0 ppm were 83-85%. Recoveries from untreated soil samples fortified with cimectacarb or CGA-179500 at 0.010-0.50 ppm and analyzed concurrently with the field samples were 69-122% and 56-123%, respectively. The method detection limit was 0.01 ppm for both cimectacarb and CGA-179500.

Ancillary Study - Freezer Storage Stability

Untreated sandy loam soil from the test site was spiked in the laboratory at 0.20 ppm with cimectacarb or CGA-179500 and stored frozen at -20 C. Duplicate samples were analyzed at various intervals up to 185 days (6 months) of frozen storage. Selected soil samples were reanalyzed after a total of 247 days of frozen storage. In addition, a field spiking study was performed. Portions of untreated sandy loam soil were fortified at the test site with 0.20 ppm of cimectacarb or CGA-179500, shipped to the analytical laboratory, and stored frozen for 35 or 64 days until analysis. The soil samples were analyzed as described previously.

DATA SUMMARY:

Field Dissipation - Terrestrial

Cimectacarb dissipated with a registrant-calculated half-life of 1.1 days from the 0- to 6-inch depth of a bareground plot of sandy loam soil located near Geneseo, Illinois, that was treated with one application of cimectacarb (2 lb ai/gal EC) at a nominal application rate of 2.63 lb ai/A (Table 9). Cimectacarb was generally not detected in the soil of a turf plot that was treated with two applications of cimectacarb (2 lb ai/gal EC) at a total nominal application rate of 2.64 lb ai/A sampled to a depth of 36 inches (Tables 3-8). The degradate,

4-(cyclo-propyl-alpha-hydroxy-methylene)-3,5-dioxocyclohexanecarboxylic acid (CGA-179500)

was detected to depths of 6 and 12 inches in the bareground and turf plots, respectively.

In the bareground plot following a single broadcast application at 2.63 lb ai/A on June 13, 1990, the average concentration of cimectacarb in the upper 6 inches of soil decreased from 0.31 ppm immediately posttreatment to 0.092 ppm at 1 day, 0.043 ppm at 2 days, and was not detected (<0.01 ppm) at 7 days posttreatment (Table 9). Cimectacarb was not detected at soil depths >6 inches (Tables 10-14). Average concentrations of CGA-179500 in the 0- to 6-inch depth increased from 0.12 ppm immediately posttreatment to 0.42 ppm at 1 day, then decreased to 0.089 ppm at 5 days, 0.011 ppm at 28 days, and

was not detected (<0.01 ppm) at 44 days posttreatment (Table 9). The registrant-calculated half-life for CGA-179500 in the 0- to 6-inch soil depth was 5.1 days. CGA-179500 was not detected below the 6-inch soil depth.

At the turf plot following two broadcast applications at 1.32 lb ai/A (total of 2.64 lb ai/A) on May 15 and June 13, 1990, cimectacarb was an average concentration of 0.010 ppm and 0.021 ppm in the upper six inches of the soil immediately after the first and one day following the second application, respectively. Cimectacarb was not detected (<0.01 ppm) at any other sampling interval or soil depth (to 36 inches). In the 0- to 6-inch depth, the average concentration of CGA-179500 was 0.014 ppm at 2 and 3 days following the first application, 0.13 ppm and 0.052 ppm at 1 and 2 days, respectively, following the second application, and was not detected (<0.01 ppm) at all other sampling intervals (Table 3). CGA-179500 was not detected in soil sampled below 6 inches, except was an average of 0.015 ppm in soil from the 6- to 12-inch depth at 1 day following the second application (Table 4).

Cimectacarb and CGA-179500 were not detected in any soil samples collected at either control plot.

During the study, cumulative rainfall totalled 29.60 inches at the bareground plot and 33.53 inches at the turf plot; all plots were irrigated with a total of 0.5 inches of water. During the study period, air temperatures ranged from 30 to 96 F, and soil temperatures (4-inch depth) ranged from 50 to 82 F. The slope of the field was 0-2% to the east, the depth to the water table was $\geq$6 feet, and there was no subdrainage in place.

Ancillary Study - Freezer Storage Stability

Recoveries from sandy loam soil from the test site treated with cimectacarb or CGA-179500 at 0.20 ppm in the laboratory and then stored frozen for up to 185 days (corrected for procedural recoveries) averaged 70.8-90.9% for cimectacarb and 77-88.5% for CGA-179500, with no discernible pattern (Table 60a). Reanalysis of selected soil samples fortified at 0.20 ppm with parent or CGA-179500 and stored frozen for 247 days yielded average recoveries of 84.4 and 87.2%, respectively (Table 60b). Recoveries from sandy loam soil fortified with 0.20 ppm of cimectacarb or CGA-179500 at the test site, shipped to the analytical laboratory, and stored frozen for 35 days were 89% for cimectacarb and 87% for CGA-179500 (Table 57). Field spike recoveries were comparatively lower after 64 days of storage, and were 76% for cimectacarb and 42% for CGA-179500 (Table 57).

COMMENTS:

General

1. The soil was not analyzed for degradates other than CGA-179500. Acceptable data concerning the aerobic soil metabolism of cimectacarb are not available to determine cimectacarb degradates that are likely to be present in the field at significant concentrations.

2. In order to confirm the application rate at each treated plot, 15 filter papers were placed in the treatment plots prior to each application. Based on analyses of the spray from petri dish samples placed in both plots, the average applications were 71% of the theoretical application rate for the bareground plot, and 109% of the theoretical application rate for the turf plot (Tables 22 and 23). The average concentration of cimectacarb in the tank mixes was 92-93% (Tables 20 and 21).

3. Although it was stated that soil samples were collected to the 42- to 48-inch depth at each plot, data were only provided to the 30- to 36-inch depth. However, since total cimectacarb residues were not detected (<0.01 ppm) below 12 inches at either treated plot, analyses of the soil samples to the 30- to 36-inch soil depth are adequate to establish the formation and decline of cimectacarb residues in the soil.

4. Cimectacarb was relatively stable in sandy loam soil from the test site stored frozen for up to 6 months; recoveries average 70.8-90.9% for cimectacarb and 77-88.5% for CGA-179500, with no discernible pattern. However, in Study 2 of this report (MRID 41869539), a freezer storage stability experiment showed that cimectacarb degraded slightly in soil (unspecified) that was stored frozen for 6 months. Average cimectacarb recoveries decreased from 92% at 0 days to 83% at 6 months, and CGA-179500 recoveries decreased to an average of 90% of the applied after 1 month, 86% after 3 months, and 77% after 6 months.

5. Soil samples scheduled to be collected from the bareground plot at 3 days posttreatment, and from the turf plot at 3 days following the second application, were not collected due to heavy rain at the test site prior to soil sampling.

6. The test site was planted to corn in 1987 and 1988. The corn was treated with alachlor (2 lb ai/A) and atrazine (1.5 lb ai/A) in 1987 and with alachlor (2 lb ai/A), atrazine (1 lb ai/A), and cyanazine (1 lb ai/A) in 1988. The site was planted to soybeans in 1989, which were treated with Pursuit (4 oz/A).

7. Prior to application of the test substance, the turf plots were sodded with Kentucky blue grass sod on April 4, 1990. The plots were irrigated with 0.50 inches of water on April 17 and 24, 1990. The turf plots were fertilized with nitrogen (0.60 lb/A), phosphate (2.25 lb/A), and potash (2.25 lb/A) on April 17, 1990. The treated and control turf plots were mowed to a height of approximately 3 inches

on May 3 and 9, 1990; the treated plot was not mowed after the initial application on May 15, 1990. The control turf plot was mowed periodically to maintain the grass height at 3-6 inches.

8. Data for analyses of grass and thatch/sod samples collected from the treated and control turf plots were included in the original document. These data were not reviewed since they are not pertinent to current Subdivision N data requirements for terrestrial field dissipation studies.

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