UNDATED

DATA EVALUATION RECORD

STUDY 6

---------- CHEM 041402 Molinate

§164-1, §164-2

FORMULATION--04--GRANULAR, 12--EMULSIFIABLE CONCENTRATE

---------- STUDY ID 40391707

Meyers, T.J. 1987b. Molinate - Field dissipation studies for aquatic food crop uses. Texas. Laboratory ID No. RRC 87-72. Unpublished study performed and submitted by Stauffer Chemical Company, Richmond, CA.

---------- DIRECT REVIEW TIME = 3

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CONCLUSIONS:

Field Dissipation - Terrestrial and Aquatic

1. This aquatic field dissipation (164-2) study provides supplemental information but does not satisfy the 164-2 data requirement at this time. The registrant should identify the route(s) of dissipation in the environment when molinate is applied in the field.

2. The registrant has submitted terrestrial field dissipation studies for molinate in Arkansas, Texas, and California. The application rate for both 8E and 15G molinate in the Arkansas study could be confirmed, but only the 8E molinate application rate could be confirmed in the Texas study. Only four percent of the applied 15G molinate in Texas was confirmed. Also, only 35 % of applied 8E or 15G molinate was confirmed in the California studies. Therefore, no meaningful half-lives could be calculated where the application rate was not confirmed. In general, molinate appeared to volatilize and partition to sediment in the rice paddies, but no route of dissipation could be confirmed since the recoveries in the field were low.

3. To satisfy the terrestrial and aquatic field dissipation data requirements, EFED is requiring three new studies to cover the use of molinate in dry-seeded and water-seeded rice in California, Arkansas, and southwestern Louisiana. These studies must be representative of rice production practices where they are conducted, and must address all routes of dissipation in the field (e.g. biological degradation, chemical degradation, air sampling over space and time for molinate volatility, the volume and concentrations of water that are

released from the rice fields, and the amount of molinate that remains in the field. The registrant should submit protocols for each study.

4. Molinate (8-E formulation)dissipated with a calculated half-life of 5 days when applied to and incorporated into dry soil. The fate of molinate (15-G formulation)applied to water could not be determined due to poor recovery in the field. Maximum molinate levels in soil and water were 0.013 and 0.27 ug/L, respectively.

METHODOLOGY:

Molinate (Ordram 8-E, 8 lb/gal EC, Stauffer Chemical) was applied (tractor-mounted sprayer) at 4.0 lb ai/A to a 1-acre field of sandy clay loam soil (0.5% organic matter, pH 6.0, soil not further characterized) located near Brookshire, Texas. The pesticide was applied on August 11, 1986, then incorporated into the soil; the treated site was planted to rice on the day of application. The site was flooded on September 20 (40 days posttreatment). On September 22 (42 days posttreatment), the site was treated (aerial) with molinate (Ordram 15-G, 15% G, Stauffer) at 5 lb ai/A. The site was drained on November 3, 1986. Soil cores (4-6/site; 1.25-inch diameter; 0- to 3-, 3- to 6-, and 6- to 12-inch depths) were collected prior to the 8 lb/gal EC treatment, immediately posttreatment, and 1, 2, 4, 6, 14, 18, 25, 32, and 39 days posttreatment. Following the 15% G treatment, soil cores (0- to 3-, 3- to 6-, 6- to 12-, and 12- to 24- inch depths) were collected 0, 1, 2, 4, 7, 9, 17, 22, 28, and 42 days posttreatment (42 through 84 days following the 8 lb ai/gal EC treatment). Irrigation water samples were collected 0, 1, 2, 4, 7, 14, 21, 25, 32, and 39 days following the 15% G treatment. The soils were composited, and the soil and water samples were placed in clean glass containers and chilled in the field. The samples were stored frozen at -20 C for up to 69 days (water) or 61 days (soil) prior to analysis.

The soil samples were analyzed using Stauffer Chemical Company Method RRC 85-26. Soil subsamples (50 g) were mixed with water (100 mL) and agitated on a reciprocating shaker for 30 minutes. Toluene (50 mL) was added to the slurry, and the mixture was agitated for an additional 60 minutes. The mixture was centrifuged, and the resulting toluene layer was removed, mixed with sodium sulfate (0.5 cm), and stored. The toluene extract was analyzed using GC with nitrogen-phosphorus detection. Recoveries from soil samples fortified with molinate at approximately 0.01 averaged 99.6%, and from samples fortified at approximately 0.42 ppm averaged 98.3%. The method detection limit was 0.01 ppm.

The irrigation water samples were analyzed using Stauffer Chemical Company Method RRC 85-25. Aliquots (50 mL) of the water were mixed with toluene (5 mL) and agitated on a reciprocating shaker for 30 minutes. The mixture was sonicated for 1 minute, and the resulting toluene layer was removed, mixed with sodium sulfate (0.5 cm), and stored. The toluene extract was analyzed using GC with nitrogen- phosphorus detection. Recoveries from water samples fortified with molinate at approximately 0.001 ppm (two samples) and 0.02 ppm (one sample) averaged 95%. The method detection limit was 0.001 ppm.

DATA SUMMARY:

Field Dissipation - Terrestrial

Molinate (Ordram 8-E, 8 lb/gal EC), applied to a field (1 acre) of sandy clay loam soil in Texas at a nominal rate of 4.0 lb ai/A, was 0.43-1.9 ppm immediately posttreatment in the upper 3 inches, 0.56- 3.1 ppm at 1 day, 0.21-0.40 ppm at 2 days, 0.54-0.97 ppm at 4 days, 0.23 ppm at 6 days, 0.04 ppm at 14 days, and <0.01 ppm at 18 through 39 days (Table 1). The pesticide, applied in August 1986, was immediately incorporated into the soil and the site was

planted to rice. In the 3- to 6-inch soil depth, molinate was 0.07-0.71 ppm immediately posttreatment, 0.10-1.4 ppm at 1 day, 0.09-0.31 ppm at 2 days, 0.20-0.42 ppm at 4 days, and was <0.01 ppm by 14 days. Molinate was ≤0.012 ppm in the 6- to 12-inch depth, except for 0.027 ppm in one sample collected at 4 days.

Meteorological data were not provided for the test site during the study period.

Field Dissipation - Aquatic and Aquatic Impact

Molinate (Ordram 15-G, 15% G), applied to a flooded rice paddy underlain with sandy clay loam soil at a nominal rate of 5.0 lb ai/A, was 0.24 ppm in the irrigation water immediately posttreatment, 0.23- 0.27 ppm at 1 day, 0.024-0.078 ppm between 2 and 14 days, and <0.004 ppm between 21 and 39 days (Table 3). In the soil, molinate was ≤0.02 ppm at all depths and sampling intervals (Table 2).

Meteorological data were not provided for the test site during the study period.

COMMENTS:

General

1. Molinate was shown to be stable in soil samples fortified at 0.10 ppm and stored frozen at -20 C for 360 days, and in water samples fortified at 0.25 ppm and stored frozen at 4 C for 30 days.

2. Complete field test data were not provided. The test soil was incompletely characterized; the soil textural analysis (sand, silt, and clay content), and the CEC were not provided. The only meteorological data provided were air temperatures and relative humidity for each application day, and the soil temperature at the time of the 8 lb/gal EC treatment. The pesticide history and agricultural maintenance practices for the plot were not reported. It was only stated that "herbicide treatments, selection of rice cultivars, and cultural practices were in accordance with typical agricultural practices for the Southern region".

3. The study author reported that an untreated field plot served as a control. The location of the control plot was not reported, and no analytical data were provided for that plot.

4. The application schedule of single applications of the 8 lb/gal EC at 4.0 lb ai/A followed by the 15% G at 5.0 lb ai/A is equivalent to the maximum cumulative seasonal application rate of 9.0 lb ai/A.

Field Dissipation - Terrestrial

1. The data were variable, and the calculated half-life of 5 days in soil for the 8-E formulation had an associated r^2 of only 0.7. The concentration of molinate in the soil ranged from 0.43 to 1.9 ppm immediately posttreatment in the upper 3 inches. 0.56 to 3.1 ppm at 1 day, 0.21 to 0.40 ppm at 2 days, and 0.54 to 0.97 ppm at 4 days. Only two values were reported for the 6-day sampling (both 0.23 ppm), and a single value was reported for the 14-day sampling (0.039 ppm).

2. The soil was not sampled deep enough to define the extent of apparent leaching. Molinate was measured at up to 0.37 ppm in the 6- to 12- inch soil depth.

3. Table 2 implies that soil samples were collected 42 through 84 days following the 15% G formulation; in fact, these "treatment to sampling intervals" refer to the earlier 8 lb ai/gal EC

formulation. Based on the dates reported on the field sheets, soil samples were collected 0 through 42 days following the 15% G treatment.

Field Dissipation - Aquatic and Aquatic Impact

The application rate of 5 lb ai/A was not confirmed. The water samples contained a maximum 0.27 ppm of molinate; the soil (0- to 3- inch depth) contained a maximum 0.012 ppm of molinate.