UNDATED

DATA EVALUATION RECORD

STUDY 5

CHEM 041402 Molinate §164-1, §164-2

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

STUDY ID 40391706

Meyers, T.J. 1987a. Molinate - Field dissipation studies for aquatic food crop uses. Arkansas. Laboratory ID No. RRC 86-121. Unpublished study performed and submitted by Stauffer Chemical Company, Richmond, CA.

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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.

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 calculated half-lives of 7 days when applied to and incorporated into dry soil. Molinate (15-G formulation)dissipated with calculated half-lives of <2 and 1.3 days in soil and water, respectively. There was one detection to 24 inches of depth near the end of the study, and some detections to 12 inches of depth when the 15-G formulation was applied under flooded conditions.

METHODOLOGY:

Molinate (Ordram 8-E, 8 lb/gal EC, Stauffer Chemical) was applied (tractor-mounted sprayer) at 4.0 lb ai/A to a 60-acre field of silty clay loam soil (1.1% organic matter, pH 5.3, soil not further characterized) located near Brinkley, Arkansas. The pesticide was applied on April 17, 1986, then incorporated into the soil; the treated site was planted to rice on the day of application. The site was flooded on May 29 (42 days posttreatment). On July 23 (97 days posttreatment), a 5-acre subplot was treated (aerial) with molinate (Ordram 15-G, 15% G, Stauffer) at 5 lb ai/A. The field was drained on August 27, 1986. From the portion of the site treated only with the 8 lb/gal EC formulation, 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 treatment, immediately posttreatment, and weekly up to 97 days posttreatment. From the portion of the site treated with both the EC and the 15% G formulations, soil cores were collected weekly between 7 and 108 days following the second treatment; deep (12- to 18- and 18- to 24-inch) cores were collected at 41 and 108 days following the 15% G treatment. Irrigation water samples were collected prior to the 15% G treatment, and 0, 1, 3 ,5, 7, 14, 21, and 28 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 166 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 ppm averaged 92 ± 18%, and from samples fortified at approximately 0.42 ppm averaged 89 ± 9%. 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 reciprocation 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 92 ± 2%. 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 (60 acres) of silty clay loam soil in Arkansas at a nominal rate of 4.0 lb ai/A, was 0.65 ppm immediately posttreatment in the upper 3 inches, 1.6 ppm at 7 days, 1.2 ppm at 14 days, 0.34 ppm at 21 days, and ≤0.018 ppm between 49 and 97 days (Table 1). The pesticide, applied in April 1986, was immediately incorporated into the soil and the site was planted to rice. In the 3- to 6-inch soil depth, molinate was 0.03 ppm immediately posttreatment, increased to 0.11 ppm at 7 days, and was ≤0.01 ppm by 21 days. In general, molinate was not detected in the 6- to 12-inch depth.

Meteorological data were not provided for the test site during the study period. The slope of the field was 0.02% and the depth to the water table was >5 feet.

Field Dissipation - Aquatic and Aquatic Impact

Molinate (Ordram 15-G, 15% G), applied to a flooded rice paddy underlain with silty clay loam soil at a nominal rate of 5.0 lb ai/A, was 0.30 ppm in the irrigation water immediately posttreatment, increased to 4.2 ppm at 1 day, and decreased to 0.02 ppm at 3 days, 0.011 ppm at 7 days, and <0.001 ppm at 14 days (Table 3). In the 0- to 3-inch soil depth, molinate was 0.32 ppm at 7 days posttreatment, 0.18 ppm at 28 days, and <0.01 ppm at 41 days (Table 2). In the deeper soil layers, molinate was a maximum 0.28 ppm in the 3- to 6-inch depth and 0.10 ppm in the 6- to 12-inch depth; the maximum concentrations at both depths occurred at 14 days posttreatment.

Meteorological data were not provided for the test site during the study period. The slope of the field was 0.02% and the depth to the water table was >5 feet.

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 calculated half-lives were questionable since the sampling intervals too infrequent to accurately assess the half-life of molinate in soil. The measured concentration of molinate in the soil increased from 0.65 to 1.6 ppm between 0 and 7 days posttreatment (however, the study author calculated a half-life of 6.9 days), and decreased from 1.2 to 0.34 ppm between 14 and 21 days.

2. The nominal application rate of 4 lb ai/A was confirmed; The EFED reviewing scientist added the values from the 0-3 and 3-6 inch soil depths and compared them to the expected value of 2 ppm. The maximum percent recovery was 86 % or 1.7 ppm total residues in the 0-6 inch soil depth.

Field Dissipation - Aquatic and Aquatic Impact

1. The soil and irrigation water were not sampled frequently enough to accurately assess the half-life of molinate. The first soil sample was not collected until 7 days posttreatment (however, the study author calculated that molinate dissipated with a half-life of <2 days). In the water, 95% of the molinate dissipated between 1 and 3 days, and 90% of what remained at 3 days dissipated by 5 days.

2. The study author suggested that presence of molinate in the 3- to 6- and 6- to 12-inch depths may have resulted from contamination that occurred while sampling the flooded field. There was also one detection at the 18-24 inch depth of soil.