US EPA ARCHIVE DOCUMENT

CASE GS -- SYSTHANE STUDY 4 PM --

CHEM 128857 Systhane

BRANCH EAB DISC --

FORMULATION 12 - EMULSIFIABLE CONCENTRATE (EC)

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Deakyne, R.O., T.F. Burnett, C.K. Brackett, and S.S. Stavinski. 1986. RH-3866 soil residue decline study. Report No. 310-86-05. Prepared and submitted by Rohm and Haas Company, Philadelphia, PA. Acc. No. 265749.

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INTRODUCTION

A preliminary report (Deakyne and Brackett, Acc. No. 256773) presenting results from the initial 4-5 months of this study was previously submitted and reviewed (Dynamac report dated 9/18/85). The following review includes those results plus the results obtained for the remainder of the test period (up to 1 year posttreatment).

CONCLUSIONS:

Field Dissipation - Terrestrial

1. This study is scientifically valid.

2. Systhane dissipated from the upper 3 inches of silt loam (PA) and loam (MS) soils with half-lives of <24 days and between 47-160 days, respectively following two applications of systhane (2 lb/gal EC) at 0.25 lb ai/A to an established stand of winter wheat. In the 3- to 6- and 6-to 12 inch soil depths, systhane concentrations were ≤0.016 ppm at any sampling interval.At 1 year posttreatment, systhane concentrations were 0.004 ppm at all soil depths.

3. This study does not fulfill EPA Data Requirements for Registering Pesticides because pretreatment samples were not analyzed, immediate posttreatment samples were not analyzed after both applications (PA site only), field test data were incomplete, and degradates were not characterized.

MATERIALS AND METHODS:

Systhane (2 lb/gal EC, purity 28.5%, Rohm and Haas Co.) was applied twice at 0.25 lb ai/A to winter wheat growing on loam soil (29.2% sand, 47.5% silt, 23.2% clay, 0.7% organic matter, pH 5.9, CEC 16.3 meq/100 g) in Cleveland, Mississippi (plot size 20 x 90 feet), on March 29 and April 12, 1984, and to winter wheat growing on silt loam soil (16% sand, 64% silt, 20% clay, 2.4% organic matter, pH 6.9, CEC 7.1 meq/100 g) in Newtown, Pennsylvania (plot size 100 x 100 feet) on May 11 and 18, 1984. The winter wheat had been planted in October, 1983 at both sites and was at growth stage 8 for the first application and growth state 10 for the second. Untreated plots (15 x 20 feet at the MS site and 100 x 100 feet at the PA site) served as controls. Soil samples (0- to 3-, 3- to 6-, and 6- to 12-inch depths) were taken periodically up to 1 year posttreatment. Samples were frozen (-15°C) until analysis.

Soil samples were screened (2 mm), celite was added, and the samples were extracted with methanol. The methanol extract was filtered, 2% aqueous sodium chloride was added, and the extract was partitioned twice with methylene chloride. Methylene chloride extracts were dried over anhydrous sodium sulfate, combined, and evaporated to dryness. The remaining residue was dissolved in toluene and applied to a column of activated Florisil. Parent systhane was eluted with 1% methanol in toluene, the eluate was evaporated to dryness, and the remaining residue was dissolved in toluene and analyzed by GC with electron capture detection. Reported recoveries from loam soil samples fortified with systhane at 0.005-0.059 ppm ranged from 80 to 120%, and from silt loam soil samples fortified at 0.005-0.156 ppm ranged from 73 to 114%. The detection limit was 0.005 ppm.

REPORTED RESULTS:

At the MS site, total precipitation was 48 inches and high and low air temperature ranges were 25 to 100°F and 6 to 81°F, respectively, during the test period. At the PA site, total precipitation was 35.63 inches and high and low air temperature ranges were 8 to 94°F and -6 to 74°F, respectively.

Systhane dissipated from the upper 3 inches of soil with half-lives of <24 days at the PA site and between 47-160 days at the MS site (Tables 1 and 2) calculated half-lives were 20 and 80 days at the PA and MS sites respectively. In the 3- to 6- and 6- to 12-inch soil depths, systhane concentrations were 0.016 ppm at any sampling interval. At 1 year posttreatment, systhane concentrations were 0.004 ppm at all soil depths tested.

DISCUSSION:

1. Pretreatment samples were not taken at either test site. At the PA site, immediate posttreatment samples were not taken following the initial application. Results from analysis of immediate posttreatment samples taken after the initial application at the MS site were not included in this hard copy but were previously reported and reviewed; those data have been included in this review.

2. No explanation was provided for the difference in the 0 day concentrations of the test substance (following the second application) found at the two test sites; 0.111 ppm at the MS site and 0.891 ppm at the PA site.

3. Field test data including depth to the water table, slope of the test site, and soil temperatures were not reported. At the PA site, meteorological data were obtained from the Philadelphia International Airport rather than from the test site. At the MS site, meteorological data were not collected on a daily basis and some data were illegible.

4. Degradates were not characterized.

5. This study was designed to evaluate the dissipation of systhane when applied to perennial grasses and is not suitable to evaluate the dissipation of systhane for other uses because the sod prevents the fungicide from contacting the soil.

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