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DATA EVALUATION RECORD

STUDY 4

CHEM 128974 Quinclorac §161-3

FORMULATION--00-Active Ingredient

STUDY MRID 41781409
Goetz, A. J. and V.W. Winkler. 1991. Photolysis of ^{14}C-BAS 514 H in soil. Laboratory Project ID: BASF Protocol No. M9012. BASF Report No. M9103. BASF Registration Document No. 91/5005. Unpublished study performed and submitted by BASF Corporation, Research Triangle Park, NC.

DIRECT REVIEW TIME = 8

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CONCLUSIONS:

Degradation - Photolysis on Soil

1. This study can be used to fulfill data requirements.

2. Quinclorac photodegraded with a registrant-calculated half-life of 122-162 days on silt loam soil irradiated for 30 days with 12 hours per day of xenon lamp light at 26° C. The major degradate, carbon dioxide accounted for 1.6% of the applied radioactivity at the end of 30 days. Unidentified polar residues accounted for up to 7.8% of the applied radioactivity during the 30 days incubation.

1

3. EFGWB concludes that this study is acceptable and fulfills EPA Data Requirements for Registering Pesticides by providing information showing that quinclorac is stable to photodegradation on soil.

4. No additional information on the photodegradation of quinclorac on soil is needed at this time.

METHODOLOGY:

Sieved (2 mm) silt loam soil (14.8% sand, 65.2% silt, 20% clay, 2.5% organic matter, pH 6.4, CEC 24.8 meq/100 g) was weighed into glass trays. The soil was then treated with [^{14}C]quinclorac (radiochemical purity >99%, specific activity 40.4 uCi/mg, BASF), dissolved in methanol, at 1 lb ai/A. The methanol was allowed to evaporate to cake the soil to approximately 1 mm thickness. The soil moisture was then adjusted to 75% of 0.33 bar. The trays were placed in a photolysis apparatus (Fig. 1), which was cooled with circulating water to maintain the temperature at 26° C during irradiation and 18° C during each dark cycle. Humidified, carbon dioxide-free air was drawn through the tank and vented sequentially through carbitol, 0.5 N sulfuric acid and 0.5 N sodium hydroxide trapping solutions. Volatiles were collected and measured weekly. Carbon dioxide was measured by LSC, and detection limits were 0.4% and 0.3% for neutral and basic volatiles, respectively. The treated soil was irradiated using a xenon lamp (Hanau Suntest, 1800 uE/m^2/s) for up to 30.9 days; wavelengths <290 nm were filtered out. Dark controls were placed in a growth chamber maintained at 26 $\pm$ 0.9° C. Irradiated samples were removed at 0, 7.08, 14.16, 19.44, and 30.09 days posttreatment. Dark samples were removed for analysis at 0, 14, and 30 days posttreatment.

Subsamples of the soil were extracted by refluxing with 0.1 N sodium hydroxide for 1 hr. The samples were cooled, centrifuged, and the supernatant was decanted and filtered. The extract was adjusted to pH 1 with hydrochloric acid and partitioned three times with ethyl acetate. The ethyl acetate fraction was analyzed with TLC on silica gel plates developed in ethyl acetate:methanol:acetic acid (80:15:15, v:v:v), toluene:ethanol:acetic acid (70:25:5, v:v:v) and toluene: ethanol (70:30, v:v). The radioactive areas were quantified using radioscanning.

DATA SUMMARY:

Quinclorac photodegraded with a registrant-calculated half-life of 122-162 days on silt loam soil irradiated with an artificial light source (xenon lamp) at 18-26 C with a 12 hour photoperiod for 30 days (Table 1). Quinclorac was 100% of the applied immediately posttreatment and 77.8-86.78% at 30.09 days (Table 6). The major degradate after 30 days of irradiation was

carbon dioxide, which was 1.6% of the applied (Table 3).

Other unidentified degradates in the ethyl acetate and aqueous phases were ≤8.9% of the applied radioactivity (Table 6). Unextractable radioactivity in the soil was ≤7.8% of the applied radioactivity.

In the dark controls, quinclorac degraded with a registrant-calculated half-life of 382-529 days. Quinclorac was 93.6-100% of the applied at 14 days posttreatment and 92.9-95.8% at 30 days (Table 7). Unidentified extractable degradates were ≤6.4%. Unextractable radioactivity was 4.9-5.1% (Table 5).

The material balances were 84.8-105.5% (average = 95.1%) in the irradiated solutions and 95.7 and 103.0 (average = 99.4%) in the dark control solutions (Tables 1 and 2).

REVIEWER'S COMMENTS:

The statistical estimations of the photodegradation half-life of quinclorac reported in this experiment are of limited value because the calculations involve extrapolation considerably beyond the experimental time limits of the study. Data are often incapable of accurately predicting trends outside of their range because small differences are magnified and reactions which appear to be linear may, in fact, be curvilinear.