

US EPA ARCHIVE DOCUMENT

8-30-88

DATA EVALUATION RECORD

STUDY 3

SHAUGHNESSY NO. 128994

MON-15151

Sec. 162-1

FORMULATION—00—ACTIVE INGREDIENT

MRID NO. 40638629

Pantano, L.K. and Y.L. Sing. 1988. The aerobic soil metabolism of MON-7200/15100, 3,5-pyridine-dicarbothioic acid, 2-(difluoromethyl)-4-(2-methylpropyl)-6-(trifluoromethyl)-,S,S-dimethyl ester. Laboratory Project No. MSL-7781. R.D. No. 866. Prepared and submitted by Monsanto Agricultural Company, St. Louis, MO.

DIRECT REVIEW TIME = 12

REVIEWED BY:	K. Patten	TITLE:	Staff Scientist
EDITED BY:	J. Harlin	TITLE:	Staff Scientist
APPROVED BY:	W. Spangler	TITLE:	Project Manager
ORG:	Dynamac Corporation Rockville, MD		
TEL:	468-2500		

APPROVED BY:	A. Reiter
TITLE:	Chemist
ORG:	EAB/HED/OPP
TEL:	557-7709

Allan J. Reiter
8-30-88

SIGNATURE:

CONCLUSIONS:

Metabolism - Aerobic Soil

This study is acceptable and fulfills EPA Data Requirements for Registering Pesticides by providing information on the metabolism of ring-labeled [¹³C/¹⁴C]MON-7200/15100 in aerobic sandy loam, silt loam, loam, and clay soils.

SUMMARY OF DATA BY REVIEWER:

[¹³C/¹⁴C]MON-7200/15100 (labeled in the 4 position of the pyridine ring; radiochemical purity >99.0%), at ~1 ppm (50 ug/50 g dry soil), degraded with registrant-calculated half-lives of 336 days in Dupo silt loam soil, 418 days in Sarpy sandy loam soil, 490 days in Sharkey clay soil, 904 days in "volcanic ash upland" loam soil, and 946 days in "volcanic ash paddy" loam soil. The treated soils were incubated in the dark at 25°C

and 75% of 0.33 atmosphere moisture for 6 months (sandy loam, clay, and loam soils) or 12 months (silt loam soil only) posttreatment. Nonvolatile degradates, each comprising $\leq 3.3\%$ of the applied in the five soils at intervals up to 6 months posttreatment, were . . .

2-(difluoromethyl)-4-(2-methylpropyl)-6-(trifluoromethyl)-3,5-pyridinedicarboxylic acid (diacid; IV);

6-(difluoromethyl)-4-(2-methylpropyl)-5-[(methylthio)carbonyl]-2-(trifluoromethyl)-3-pyridinecarboxylic acid (reverse acid; III); and

2-(difluoromethyl)-4-(2-methylpropyl)-5-[(methylthio)carbonyl]-6-(trifluoromethyl)-3-pyridinecarboxylic acid (normal acid; II).

After 6 months of incubation, between 4.9 and 16.0% of the applied had been volatilized as undegraded MON-15151 and 0.06-0.71% had been volatilized as $^{14}\text{CO}_2$; unextractable [^{14}C]residues ranged from 3.99 to 11.10% of the applied. In the Dupo silt loam soil, the maximum concentration of the nonvolatile degradates occurred at 9 months posttreatment; the diacid accumulated to a maximum concentration of 6.9% of the applied, the reverse acid accumulated to 3.0% of the applied, and the normal acid to 5.9% of the applied. In the Dupo silt loam soil at 12 months posttreatment, $\approx 19.6\%$ had been volatilized as MON-15151, 0.43% was $^{14}\text{CO}_2$, and 7.08% was unextractable. The material balances in all soils throughout the study ranged from 92.49 to 102.06% of the applied.

DISCUSSION:

1. Although it was stated that additional flasks of soil were autoclaved and treated with [$^{13}\text{C}/^{14}\text{C}$]MON-7200/15100 to serve as sterile controls, no data were provided.
2. The volcanic ash soils are not typical of soils in the United States. They were included in this study because MON-15151 is to be registered in Japan.

MATERIALS AND METHODS

MATERIALS AND METHODS:

[¹³C/¹⁴C]MON-7200/15100 (labeled in the 4 position of the pyridine ring; radiochemical purity >99.0%, specific activity 18.32-26.21 mCi/mmol, Monsanto Chemical Company) was applied at ≈1 ppm (50 μg/50 g dry soil) to flasks containing sieved (2 mm) moist (75% of 0.33 atmosphere) Sarpy sandy loam, Dupo silt loam, Sharkey clay, volcanic ash paddy loam, or volcanic ash upland loam soil (Table 5). After treatment, the soil was "lightly shaken" and the flasks were sealed with an aerobic trapping tower that was constructed of two foam plugs (in the neck of the flask), a layer of Drierite, a foam plug, Ascarite II (NaOH fused to a silicate carrier), a foam plug, Ascarite II, a foam plug, Drierite, and a foam plug (at the top of the column). All flasks of soil were incubated in the dark at 25°C; the soils were remoistened once or twice each week. The trapping towers were replaced weekly. Duplicate flasks were removed for analysis at intervals up to 6 months (Sarpy sandy loam, Sharkey clay, volcanic ash paddy loam, and volcanic ash upland loam soils) or 12 months (Dupo silt loam soil) posttreatment.

Soil samples were transferred to centrifuge tubes. The sample flasks were rinsed with acetonitrile:water (50:50), and the rinses were transferred to the appropriate centrifuge tubes. The soils were extracted by shaking for 20 minutes on a wrist action shaker, then centrifuged. The acetonitrile:water extracts were decanted and fresh acetonitrile:water was added to the soil. The soils were extracted with acetonitrile:water a total of five times; the extracts were combined and an aliquot was analyzed by ISC. Additional aliquots were analyzed by HPLC with radioactivity detection, and [¹⁴C]compounds were tentatively identified by comparison to reference standards of MON-7200/15100, Normal acid, Reverse acid, and diacid. The extracted soils were analyzed for unextractable radioactivity by ISC following combustion.

In order to confirm the identity of [¹⁴C]compounds, the acetonitrile:water extract of the 6-month Dupo silt loam soil sample was made basic with sodium bicarbonate and partitioned three times with hexane. The aqueous fraction was acidified and partitioned three times with ether. The hexane, ether, and aqueous fractions were analyzed by ISC; the hexane and aqueous fractions were analyzed by HPLC with radioactivity detection. [¹⁴C]Compounds isolated by HPLC were identified by HPLC/MS (negative ion mode).

The foam plugs from the trapping towers were analyzed by ISC. Foam plugs from the Dupo silt loam (week 28) and volcanic ash upland loam (week 22) soil were extracted with ether; aliquots of the ether extracts and the extracted foam plugs were analyzed by ISC. Additional aliquots of the ether extracts were concentrated, dissolved in acetonitrile:water (50:50), and analyzed by HPLC and ISC. The Ascarite samples were mixed with distilled water, then sulfuric acid was added dropwise to the solution. Escaping CO₂ was trapped in a phenethylamine solution; the phenethylamine solution was analyzed by ISC.

Dithiopyr Science Review

Page _____ is not included in this copy.

Pages 5 through 27 are not included in this copy.

The material not included contains the following type of information:

- _____ Identity of product inert ingredients.
- _____ Identity of product inert impurities.
- _____ Description of the product manufacturing process.
- _____ Description of product quality control procedures.
- _____ Identity of the source of product ingredients.
- _____ Sales or other commercial/financial information.
- _____ A draft product label.
- _____ The product confidential statement of formula.
- _____ Information about a pending registration action
- X FIFRA registration data.
- _____ The document is a duplicate of page(s) _____
- _____ The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.
