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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 5 1995

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Methamidophos. Confined Field Rotational Crop Study (165-1). Case No. 0043 Chemical No. 101201 MRID No. 427587-01. DP Barcode D211934. CBRS No. 15088.

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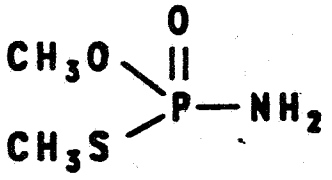
BACKGROUND

Miles, Inc has submitted a limited field rotational crop study depicting residues of methamidophos in rotational crops following application to soil. The qualitative nature of the residue in plants and animals is not adequately understood.

The structure is shown below.



Tolerances are established for residues of the insecticide methamidophos (O, S-dimethyl phosphoramidothioate) in/on several crops ranging from 0.02 (sugarbeet root) to 1.0 ppm (broccoli, brussel sprouts, cabbage, cauliflower, cucumber, eggplant, lettuce, peppers, and tomatoes). A tolerance with regional registration is established at 1.0 ppm in/on celery [40 CFR 180.315a and b].

Conclusions

1. The nature of the residue in plants is not adequately understood. A due date of 10/27/96 is established for submission of metabolism studies in plants.

2. ^{14}C-methamidophos was applied at an application rate of 6.3 lbs ai/A (1x).

3. Total radioactive residues in all crops (leafy vegetable, root, grain) exceeded 0.01 ppm at the 30 day plantback interval, and the small grain crop TRR exceeded 0.01 ppm at the 146 and 249 day plantback intervals.

4. Characterization of the TRR resulted in bound residues after acid hydrolysis above the trigger value of 0.05 ppm at the 29 day plant interval for wheat straw.

5. Radioactivity found in control samples ranged from 0.01 ppm to 0.037 ppm. This is probably due to uptake of $^{14}CO_2$ residues from the soil.

6. Samples were stored in frozen storage for up to 39 days.

Recomendations

A 150 day plantback interval may be proposed for all crops because of reasons cited in Conclusions 3 and 4. If the registrant desires a shorter plantback interval, then additional characterazation of bound residues will be required. The registrant is referred to the 7/16/92 guidance document "Additional Guidance for Conducting Plant and Livestock Metabolism Studies" for further assistance.

Detailed Consideration

[S-methyl-^{14}C]-methamidophos was applied to sandy loam soil in three separate plots at a rate of 6.3 lb ai/A(1X). The radiochemical purity was 98.2% and the specific activity was 25.7 mCi/mmole (13,983 dpm/ug). Lettuce, wheat, and radish were planted 29, 146, and 279 days after application. The crops were grown in a climate-controlled screenhouse. Control crops were planted in a single,

2

adjacent plot. Samples were harvested at maturity with the exception of wheat.

The TRR in the various matrices are summarized in Table 1. Raw data (dpm, weights) needed to verify the reported results were supplied.

Triplicate aliquots of crop samples were homogenized with acetonitrile (ACN), filtered and rinsed with additional ACN. Extracts were then concentrated by vacuum rotary-evaporation. Extracted solids were dried, weighed and combusted to quantitate ^{14}C residues. Concentrated crop extracts were diluted with water and shaken with dichloromethane twice. Duplicate aliquots of the organic and aqueous fractions were radioassayed by LSC. Acid and base hydrolysis was used to release bound residues. Results of extractions are reported in Table 2.

Samples were stored frozen for up to 37 days after harvest. A storage stability study was conducted which resulted in adequate recoveries (95% avg) after 34 days.

The analysis of soil samples was also reported. The methamidophos concentration in soil 1 day posttreatment was 3.8 ppm. Concentrations in soil 29 to 385 days posttreatment ranged from 0.32 ppm to 0.09 ppm, respectively.

Table 1. Total Radioactive Residues in Rotational Crops.				
Matrix	Days after Planting	Plantback Interval		
		29-Days	146-Days	279-Days
Immature Wheat	26-33	0.07 ppm	0.011 ppm	0.008 ppm
Wheat Grain	106-132	0.032 ppm	0.017 ppm	0.036 ppm
Wheat Straw	106-132	0.063 ppm	0.032 ppm	0.049 ppm
Lettuce	40-48	0.011 ppm	ND	ND
Radish Root	34-48	0.015 ppm	ND	ND
Radish Top	34-48	0.026 ppm	ND	0.007

ND=Not Detected, LOD = 0.01 ppm
Radioactivity found in control samples ranged from 0.010 to 0.037 ppm

Table 2. Characterization of TRR

Matrix	Extractable (ppm)			Extracted Solids[2]			Bound		
	29 days	146 days	279 days	29 days	146 days	279 days	29 days	146 days	279 days
Wheat, Immature	0.001	ND	ND[1]	0.032	NP	NP	0.073	0.011	0.008
Wheat Straw/chaff	0.005	ND	0.010	NP	NP	NP	0.058	0.029	0.039
Wheat Grain	0.001	ND	0.003	0.019	0.015	0.020	0.012	ND	0.013
Lettuce	0.002	NP	NP	NP	NP	NP	0.009	NP	NP
Radish Tops	ND	NP	0.004	0.014	NP	NP	0.012	NP	0.003
Radish Roots	0.005	NP	NP	0.004	NP	NP	0.006	NP	NP

1. ND = Not detected, NP = analysis not performed since residues were <0.01 ppm
2. Residues were hydrolyzed with 1N HCl.

cc: Reviewer(F. Fort), Reg. Std. File, RF, SF, Circ.
RDI:Pilot Team:8/22/95:RPerfetti:8/25/95
7509C:CBRS:CM#2:Rm805B:305-7478:FAFort/FF:8/17/95
Disk6:methamid.rot