CASE GS0178 GLYPHOSATE STUDY 3 PM 25 06/16/83

CHEM 103601 Isopropylamine glyphosate

BRANCH EFB DISC 30 TOPIC

FORMULATION 00 - ACTIVE INGREDIENT

FICHE/MASTER ID 00039943 CONTENT CAT 01

Henshall, A. and B.B. Brightwell. 1972. Final report on MON-0573, residue and metabolism; Part 7: Runoff of MON-0573 from inclined soil beds. Agricultural Research Report No. 275.

SUBST. CLASS = S.

DIRECT RVW TIME = 9 1/2 (MH) START-DATE END DATE

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CONCLUSION:

Mobility - Leaching and Adsorption/Desorption

This runoff study could not be validated because pretreatment and immediate posttreatment soil samples were not analyzed to confirm glyphosate application rates. In addition, this study would not fulfill EPA Data Requirements for Registering Pesticides because the method was not one of the three (i.e., soil TLC, soil columns, batch equilibrium) recommended for determining pesticide mobility in soils, and complete soil characteristics were not presented.

MATERIALS AND METHODS:

Soil beds (stainless steel, 36-inch length x 12-inch width x 6-inch depth, 7.5° slope) were filled to a 5 inch depth with Ray silt loam, Norfolk sandy loam, or Drummer silty clay loam soil (Table 1). [^{14}C]-Glyphosate (MON 0573, ~93% pure, specific activity 8.32 mCi/mM, source unspecified) in 0.1 M ammonium carbonate, was surface applied at 1.0 lb ai/A to the upper third of the soil bed. The soil was watered to saturation at 0.75 inches/hour 1, 3 and 7 days after treatment. Two 50-ml runoff samples were collected sequentially from the soil beds (Table 2).

The runoff samples were centrifuged and aliquots of the water fraction were analyzed for radioactivity by LSC. Sediment samples were lyophilized and analyzed for total radioactivity by combustion and LSC.

REPORTED RESULTS:

A total of 0.0115, 0.0144, and 0.0044% of the applied radioactivity was recovered from runoff water samples from the silt loam, sandy loam, and silty clay loam soils, respectively (Table 3). Radioactivity recovered in the sediment totaled 0.0084% (silt loam), 0.0071% (sandy loam) and 0.00079% (silty clay loam) of applied.

DISCUSSION:

1. Complete soil characteristics, such as CEC and silt and sand content, were not reported.

2. The method was not one of the three (i.e. soil TLC, soil column, or batch equilibrium) recommended for determining pesticide mobility in soils.

3. The detection limit and recoveries from fortified samples were not reported.

4. Soil samples, other than the sediment fraction of the runoff water, were not analyzed for [^{14}C]glyphosate residues. Consequently, vertical or horizontal movement of [^{14}C]glyphosate in the soil could not be determined, and the extent of glyphosate mobility in runoff could not be accurately determined.

5. Total runoff from the soil beds was not reported. The amount of runoff water collected (two 50-ml samples) may not have been adequate to estimate pesticide loss in runoff water.

Table 1. Soil characteristics.

Soil type	Clay %	Organic matter %	pH
Ray silt loam	10	1	6.5
Norfolk sandy loam	2	1	5.7
Drummer silty clay loam	37	6	7.0

Table 2. Water (inches) required[a] to initiate runoff from 3 soils treated with [^{14}C]glyphosate at 1.0 lb ai/A.

Soil type	Day 1	Day 3	Day 7	Total applied
Silt loam	0.75	0.15	0.21	1.11
Sandy loam	0.91	0.15	0.28	1.34
Silty clay loam	0.43	0.21	0.30	0.94

[a] Water was applied at 0.75 inch/hour.

Table 3. Radioactivity (% of applied) in 50-ml samples of runoff water and sediment from three soils treated with [^{14}C]glyphosate at 1.0 lb ai/A.

Sampling interval (days)	Silt loam		Sandy loam		Silty clay loam	
	Water	Sediment	Water	Sediment	Water	Sediment
1	0.0028	0.0021	0.0062	0.0030	0.0001	0.00004
	0.0061	0.0016	0.0065	0.0032	0.0002	0.00003
3	0.0009	0.0013	0.0007	0.0003	0.0009	0.0001
	0.0011	0.0018	0.0006	0.0003	0.0016	0.0001
7	0.0003	0.0007	0.0002	0.0001	0.0007	0.00001
	0.0003	0.0009	0.0002	0.0002	0.0009	0.00001
Total	0.0115	0.0084	0.0144	0.0071	0.0044	0.00029