

CASE GS0178 GLYPHOSATE STUDY 1 PM 25 06/16/83

CHEM 103601 Isopropylamine glyphosate

BRANCH EFB DISC 30 TOPIC 050530 GUIDELINE 40 CFR 163.62-10b

FORMULATION 00 - ACTIVE INGREDIENT

FICHE/MASTER ID 00108182 CONTENT CAT 01

Rueppel, M., B. Brightwell, and A. Henshall, et al. 1972. Final Report on MON-0573, residue and metabolism: Part 4. The rate of dissipation of MON-0573 in soil: Agricultural Research Report No. 271. Unpublished study received Jan. 30, 1973 under unknown admin. no.; submitted by Monsanto Co., Washington, DC; CDL:120303-E.

FICHE/MASTER ID 00108183 CONTENT CAT 01

Henshall, A., B. Brightwell, and J. Marvel. 1972. Final Report On MON-0573, residue and metabolism: Part 5. Soil binding and phytotoxicity of MON-0573 and its metabolites on soils: Agricultural Research Report No. 274. Unpublished study received Jan. 30, 1973 under unknown admin. no.; submitted by Monsanto Co., Washington, DC; CDL:120303-F.

SUBST. CLASS = S.

DIRECT RVW TIME = 22 (MH) START-DATE END DATE

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Two hardcopies (00108182, 00108183) were combined for this review because they describe a single greenhouse study.

CONCLUSIONS:Confined Accumulation - Rotational Crops

1. This study is scientifically valid.
2. [¹⁴C]Glyphosate residues in 4-week-old soybeans grown in aged (16-weeks) water-extracted and unextracted silt, sandy loam, and silty clay loam soils treated with [¹⁴C]glyphosate (purity ~96%) at 4 ppm ranged from 0.76 to 4.12 ppb. Glyphosate residues in the soil during the growing period ranged from 0.64 to 3.72 ppm.



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3. This study does not fulfill EPA Data Requirements for Registering Pesticides because the plant growth and growing conditions were not completely described and glyphosate residues in the soybeans and the soils were not characterized.

MATERIALS AND METHODS:

Three soils (Table 1) were adjusted to 11% moisture and treated with methyl-labeled [^{14}C]glyphosate (MON 0543, ~96% pure, specific activity 8.03 mCi/mM, Monsanto Corporation) at 4 ppm. The treated soils were planted with corn and aerobically incubated (90 F) for 16 weeks in the greenhouse. Following the incubation, half of each treated soil (~1 kg) was lyophilized and sieved; the remaining soil (~1 kg) was extracted 5 times with water, lyophilized and sieved. Both soils were placed in plastic pots, planted with soybeans, watered, and incubated in the greenhouse at 75 F. After seed germination, the pots were watered twice daily. The plant shoots were harvested after 4 weeks, ground, and analyzed for total radioactivity by combustion and LSC.

Soil samples were taken immediately after treatment, before planting the soybeans, and after harvest and analyzed for total radioactivity by combustion and LSC.

REPORTED RESULTS:

[^{14}C]Glyphosate residues in soybeans grown in unextracted soil totaled 0.096%, 0.019%, and 0.051% of the applied radioactivity for the silt, sandy loam, and silty clay loam soils, respectively (Table 2). Residues in soybeans grown in water-extracted soil totaled 0.103%, 0.071%, and 0.039% of the applied radioactivity for the silt, sandy loam, and silty clay loam soils, respectively.

DISCUSSION:

1. Plant growth and growing conditions were not adequately described (watering, growth rate, and soil temperature).
2. Residues in the soil and plants were not characterized.
3. No CEC data were reported. The reported soil textures could not be verified because the sums of the fractions did not total 100%. Based on the reported fractions, the soil reported to be a silt loam would be a silt, and the soil reported to be sandy loam would be a loamy sand according to the USDA soil classification system.
4. Detections limits and percent recovery from fortified samples were not reported.

Table 1. Soil characteristics.

Soil type	pH	Sand	Silt	Clay	Organic matter
		_____	_____	_____	_____
Silt	6.5	6.0	83.2	9.6	1.0
Silty clay loam	7.0	2.0	55.4	36.8	6.0
Loamy sand	5.7	86.0	11.0	2.3	1.0

Table 2. [^{14}C]Glyphosate residues (% of applied) in soybeans grown on water-extracted and unextracted soil and in soils treated at 4 ppm and aged for 112 days.

Soil type	Soil			Plant
	Posttreatment ^a	Preplant ^b	Final	
Silt	97.7			
Unextracted		21.9	19.4	0.096
Extracted		17.1	18.2	0.103
Sandy loam	97.8			
Unextracted		92.9	91.1	0.019
Extracted		56.3	57.6	0.071
Silty clay loam	94.2			
Unextracted		43.0	36.6	0.051
Extracted		35.5	31.4	0.039

^a Immediate posttreatment samples; values represent extractable plus soil bound residues recovered.

^b Values represent the % of applied radioactivity detected after aging for 112 days, immediately before planting to soybeans.