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(TDR03B) DATA EVALUATION RECORD

CASE GS0179 TRIFLURALIN STUDY 52 PM PM# ~~08/07/84~~

CHEM 036101 Trifluralin

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FORMULATION 90 - FORMULATION NOT IDENTIFIED

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Parka, S., and J. Tepe. 1969. The disappearance of trifluralin from field soils. Weed Sci. 17(1):119-122. Also In unpublished submission received June 20, 1969 under 9F0851; submitted by Elanco Products Co., Div. of Eli Lilly and Co., Indianapolis, IN; CDL:093147-A.

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CONCLUSIONS:

Field Dissipation - Terrestrial

1. This monitoring study is scientifically valid.

2. Trifluralin was detected in 107 soil samples taken nationwide at <0.01-0.98 ppm in fields treated with trifluralin (test substance uncharacterized) at various rates for 1, 2, 3, or 4 consecutive years.

3. This study does not fulfill EPA Data Requirements for Registering Pesticides because the test substance was uncharacterized, the soils were incompletely characterized, application rates were not confirmed, the sampling protocol was inadequate to establish a decline curve for trifluralin, the pattern of formation and decline of degradates was not determined, and field test data were incomplete.

MATERIALS AND METHODS:

A monitoring study was conducted with soil samples (107) collected in the western (33 samples), central (28 samples), and eastern (46 samples) United States. Sampled fields had trifluralin (test substance uncharacterized) applied (at various rates, see Tables 1, 2, and 3) commercially as a broadcast application. An attempt was made to collect soil samples (soils ranging from fine sandy loam to clay not further characterized, see Tables 1, 2, and 3) for as many consecutive years (1 to 4 years) of application on the same sampling date. Information collected from the cooperators included: application rate and method, time interval between application and incorporation, incorporation method, soil type, previous pesticide history, and cultural operations between successful crop seasons. Soil samples were collected from depths of 0- to 6-inches, in some location from depths of 0- to 3- or 6- to 12- inches), 5 to 7 months posttreatment, placed in plastic bags and analyzed for trifluralin within 5 to 7 days.

Soil samples were blended, extracted with methanol, partitioned in methylene chloride, chromatographed on a Florisil column using n-hexane as the eluting solvent, and trifluralin concentrations were determined by GC with an electron affinity detector. The detection limit was ~0.005 ppm.

REPORTED RESULTS:

In western United States trifluralin was detected in the soil at 0.01-0.98 ppm, and the percent of theoretically applied trifluralin remaining in the soil ranged from 1.0 to 17.3% (Table 1). In central United States trifluralin concentrations in soil samples were detected at <0.01-0.18 ppm, and the percent of theoretically applied trifluralin remaining in the soil ranged from 0.3 to 9.3% (Table 2). The respective figures for the eastern United States were <0.01-0.23 ppm, and 0.2 to 30.7% (Table 3). The percentage of trifluralin remaining in the soil, reportedly, did not increase as the number of applications to the same soil increased from 1 to 4 years, and that trifluralin, therefore, does not accumulate in soil from repeated annual applications.

DISCUSSION:

1. Soil characteristics, such as textural analyses, pH, organic matter content, and CEC, were not provided.

2. The test substance was uncharacterized.

3. Because this was a monitoring study, application rates were not confirmed, the sampling protocols were inadequate to establish a decline curve for trifluralin, and the patterns of formation and decline of degradation products were not determined.

4. The conditions under which the samples were maintained until analysis were not specified.

5. Recovery values were not provided.

6. Field test data were incomplete and did not include meteorological data, irrigation schedule, depth to water table, size and slope of plots (fields), soil temperature, or application and sampling times and methods.

Table 1. Trifluralin (ppm, % of applied) in soil samples in western United States when applied 1, 2, 3, or 4 consecutive years to the same soil.

Sampling location	Soil type	Years of application	Total applied (lb/A)	Trifluralin ppm	Trifluralin %[a]
Welton, AZ	Sandy loam	2	1.80	0.03	1.7
		3	2.80	0.03	1.1
Phoenix, AZ	Sandy loam[b]	6	6.00	0.21	3.5
		6	24.00	0.98	4.1
Phoenix, AZ	Sandy clay loam[b]	1	0.75	0.06	8.0
		3	3.00	0.08	2.7
Phoenix, AZ	Silty clay loam	1	0.75	0.01	1.3
		2	2.00	0.05	2.5
Queen Creek, AZ	Silt loam	3	2.75	0.05	1.8
Yuma, AZ	Clay loam	1	1.00	0.05	5.0
Kingsbury, CA	Sandy loam	1	0.75	0.03	4.0
McFarland, CA	Sandy loam	1	0.75	0.04	5.3
		2	1.50	0.06	4.0
		3	2.25	0.07	3.1
McFarland, CA	Sandy loam	1	0.75	0.10	13.3
		2	1.50	0.08	5.3
		3	2.25	0.08	3.5
		3	2.25	0.08	3.5
		4	3.00	0.09	3.0
McFarland, CA	Sandy loam	3	2.75	0.19	6.9
		4	3.75	0.28	7.5
		4	4.75	0.28	5.9
Readley, CA	Sandy loam	2	1.50	0.09	6.0
Filer, ID	Silt loam	1	0.63	0.03	4.8
		1[c]	1.00	0.01	1.0
Nampa, ID	Silt loam	1	0.63	0.07	11.1
		1[c]	1.00	0.01	1.0
Delta, UT	Clay loam	1	1.00	0.11	11.0
Quincy, WA	Sandy loam	1	0.75	0.11	14.7
		2	1.50	0.26	17.3
		2[d]	1.50	0.14	9.3
Quincy, WA	Silt loam	1	0.75	0.10	13.3
Touchet, WA	Sandy loam	2	1.50	0.16	10.7

[a] Percent of trifluralin in remaining in the soil, calculated from initial application rate and amount detected at sampling.

[b] Sampled to a depth of 0- to 3- inches.

[c] Application of trifluralin was made two crop seasons prior to sampling.

[d] Trifluralin was not applied to the field between the first and third crop season.

Table 2. Trifluralin (ppm, % of applied) in soil samples central United States when applied 1, 2, 3, or 4 consecutive years to the same soil.

Sampling location	Soil type	Years of application	Total applied (lb/A)	Trifluralin ppm	Trifluralin %[a]
Eric, CO	Clay loam	1	0.75	0.03	4.0
		2	1.50	0.03	2.0
Barnes, KS	Clay loam	1	0.75	0.03	4.0
Alliance, NB	Fine sandy loam	1	1.00	0.01	10.0
Hinton, OK	Sandy loam	1	0.60	0.05	8.3
		2	1.20	0.04	3.3
		3	1.50	0.02	1.3
		4	2.70	0.09	3.3
Donna, TX	Sandy loam	1	0.06	0.02	3.3
		2	2.00	0.04	2.0
La Feria, TX	Sandy loam	3	3.00	0.03	1.0
Monday, TX	Sandy loam	1	0.05	<0.01	2.0
		2	1.00	0.02	2.0
McAllen, TX	Sandy loam	1	0.75	0.01	1.3
		2[b]	1.60	0.03	1.9
		3[b]	3.00	<0.01	0.3
Mc Allen, TX	Clay	4	4.00	0.05	1.3
Edmondston, TX	Sandy clay loam	1	0.75	0.03	4.0
		2	1.50	0.05	3.3
Edmondson, TX	Sandy clay loam	3	2.34	0.13	5.6
		4	3.09	0.07	2.3
Pabens, TX	Sandy clay loam	1	0.75	0.07	9.3
		2	1.50	0.10	6.7
		3	2.55	0.12	4.7
		4	3.25	0.18	5.5
Shallowater, TX	Sandy clay loam	1	0.50	0.02	4.0
		2	1.00	0.03	3.0
		3	1.45	0.04	2.8

[a] Percent of trifluralin remaining in the soil, calculated from initial application rate and amount detected at sampling.

[b] The last application of trifluralin was made two crop seasons prior to sampling.

Table 3. Trifluralin (ppm, % of applied) in soil samples in eastern United States when applied 1, 2, 3, or 4 consecutive years to the same soil.

Sampling location	Soil type	Years of application	Total applied (lb/A)	Trifluralin residues ppm	Trifluralin residues %[a]
Little Rock, AR.	Sandy loam	1	0.75	0.02	2.7
		2	1.50	0.01	0.7
		3	2.25	0.06	2.7
		4	3.00	0.04	1.3
Nettleton, MS	Sandy loam	1[b]	0.75	0.07	9.3
		2	1.43	0.11	7.7
		3	2.43	0.04	1.6
Jackson, TN	Sandy clay loam	1[b]	1.00	<0.01	1.0
		2[b]	2.00	<0.01	0.5
		3	3.00	0.03	1.0
		1[b]	2.50	0.01	0.4
		2[b]	5.00	0.02	0.4
		3	7.50	0.03	8.0
		1[b]	5.00	<0.01	0.2
		2[b]	10.00	0.06	0.6
		3	15.00	0.17	1.1
Sidon, MS	Silt loam	3	2.50	0.07	2.8
Greenwood, MS	Silt loam	2	1.50	0.04	2.7
Holly Grove, MS	Silt clay loam	1	1.00	0.09	9.0
Blakely, GA	Sandy loam	1	1.00	0.07	7.0
		2	2.00	0.07	3.5
		2[c]	2.00	0.10	5.0
		2	3.00	0.11	3.7
Blakely, GA	Clay loam	1	1.00	0.07	7.0
		2	2.00	0.10	5.0
		3	3.00	0.10	3.3
		4	3.20	0.07	2.2
Midville, GA	Sandy loam	1	0.75	0.11	14.7
		2	1.75	0.06	3.4
		3	2.00	0.14	7.0
		4	2.75	0.13	4.7
Montmorenci, SC	Sandy loam	1	0.50	0.12	24.0
		2	1.25	0.06	4.8
		3	1.88	0.06	3.2
Jackson, NC	Silt loam	1	0.75	0.06	8.6
		2	1.75	0.07	4.0
		3	2.75	0.02	0.7
Georgetown, DE	Sandy loam	2	1.25	0.10	8.0
Braceville, IL	Loam	1	0.75	0.11	14.7
		1	0.75	0.23	30.7
Waterville, NY	Silt loam	1	1.00	0.06	6.0
Muncie, IN	Clay loam	1	1.20	0.07	5.8
		2	2.20	0.03	1.4
		3	3.20	0.06	1.9
Des Moines, IA	Silty clay loam	1	1.00	0.01	10.0
		2	2.00	0.08	4.0

[a] Percent of trifluralin remaining in the soil, calculated from initial application rate and amount detected at sampling.

[b] Application of trifluralin was made two and three crop seasons prior to sampling, respectively.