2-1-93

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

FEB 1 1993

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Trifluralin on Green Onions, Field Corn Grain, Sugarbeets (Processing) and Soybeans (Processing).
DP Barcode: D182371; CRBS No. 10541;
MRID No.:424482-01 thru 424482-04;

FROM: David J. Miller, Health Services Officer, USPHS DJM
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Attached is a review of a registrant's response to residue chemistry data requirements for the raw commodities green onions and field corn, and the processed commodities sugar beets and soybeans. This information was reviewed by Acurex Corporation under the supervision of CBRS/HED. The data assessment has undergone secondary review in the branch and has been revised to reflect branch policies.

CBRS conclusions and recommendations are presented in the attached Acurex report (pp. 2-3).

cc: RF, SF, Circ., Acurex, DJM.
RDI: ARathman 1/25/93;MMetzger 1/28/93;EZager 1/29/93.

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TRIFLURALIN
(Chemical Code 036101)
(CBRS No. 10541; DP Barcode D182371)

TASK 3

Registrant's Response to Residue Chemistry Data Requirements

December 31, 1992

Contract No. 68-DO-0142

Submitted to:

U.S. Environmental Protection Agency
Arlington, VA 22202

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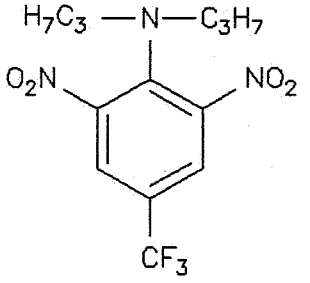
REGISTRANT'S RESPONSE TO RESIDUE CHEMISTRY REQUIREMENTS

Task 3

BACKGROUND

The Trifluralin Guidance Document (4/87) and the Trifluralin Reregistration Standard Update (10/91) indicated that if the registrant intends to support a crop group tolerance for bulb vegetables, data are required depicting residues of trifluralin in or on green onions. Data were also required depicting trifluralin in or on grain from field corn having received an over-the-top treatment of trifluralin at 1 lb ai/A and harvested at the shortest posttreatment interval consistent with established good agricultural practices. Field corn trials were required from IA, IL, and OH. In addition, data were required depicting trifluralin residues in processed commodities derived from sugar beets and soybeans bearing measurable weathered residues. In response, DowElanco and the Trifluralin Data Development Consortium submitted data (1992; MRIDs 42448201 through -04) depicting residues of trifluralin in or on green onions, corn grain, and processed commodities of sugar beets and soybeans. These submissions are reviewed here to determine their adequacy in fulfilling residue chemistry data requirements. The Conclusions and Recommendations stated in this review pertain only to trifluralin residues in or on green onions and corn grain and in processed sugar beet and soybean commodities.

The nature of the residue in plants and animals is adequately understood. The residue of concern in both plants and animals is trifluralin per se. Adequate analytical methods are available for enforcing trifluralin tolerances in plants. These methods are listed in PAM, Vol. II as Methods II and III.



Trifluralin

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Tolerances for residues of trifluralin (α,α,α-trifluoro-2,6-dinitro-*N,N*-dipropyl-*p*-toluidine) in or on raw agricultural commodities are currently expressed in terms of trifluralin per se (40 CFR §180.207 and §185.5900). As there are no Codex MRLs for residues of trifluralin, there is no question with respect to Codex/U.S. tolerance compatibility.

CONCLUSIONS/RECOMMENDATIONS

1. The residue study on green onions is adequate. Residues of trifluralin were <0.01-0.016 ppm in or on green onions harvested 60 days following a directed, postemergence application of trifluralin at 0.8-1.1X the maximum rate. Residues of trifluralin in or on green onions did not exceed the established tolerance of 0.05 ppm for root vegetables. The registrant should propose a group tolerance for bulb vegetables. Based on the available data for garlic, green onions, and onions (dry), a tolerance of 0.05 ppm is appropriate.

2. The residue study on field corn grain is not adequate at the present time. In all studies, there were extended delays in sample delivery to the analytical laboratory. The registrant must demonstrate that sample integrity was not compromised during these 7 to 25 day shipping periods (i.e., that storage conditions during transit remained adequate to prevent significant degradation of residue). If the registrant is able to satisfactorily demonstrate this to the Agency, then no further data are required on field corn grain.

3. The sugar beet processing study is adequate. Residues of trifluralin were 0.002-0.008 ppm in or on sugar beets treated with trifluralin at 5X the maximum label rate. As a result of processing, residues of trifluralin did not concentrate in molasses or refined sugar but did concentrate by 4.7-8.8X in dehydrated pulp. Nevertheless, a feed additive tolerance is not necessary because concentrations in dehydrated pulp resulting from a 5X exaggerated treatment rate are still below the rac tolerance; the rac tolerance of 0.05 ppm for sugar beets will apply to the processed sugar beet commodities.

4. The soybean processing study is adequate pending submission of acceptable data supporting the registrant's statement that the 1.9X exaggerated rate used in this study is the highest rate tolerated by soybeans, and sufficient documentation to indicate that the 14 day shipping period did not adversely affect sample integrity (i.e., that storage conditions during transit remained adequate to prevent significant degradation of residue). If these additional submissions are adequate, then the current registrant-submitted data are acceptable and no food/feed additive tolerances will be required for trifluralin residues in or on soybean grain dust or soybean processed commodities.

5. The GC/electron capture detector (ECD) methods AM-AA-CA-R023-AA-755 and GRM92.11 are adequate for data collection. Method AM-AA-CA-R023-AA-755 adequately determines trifluralin residues in sugar beet, green onion, and soybean commodities, and method GRM92.11 adequately determines trifluralin residues in corn grain.

6. The available storage stability data indicate that trifluralin is stable in green onions, corn grain, and sugar beets (rac and processed commodity) under the storage conditions and for the intervals reflected in the current submissions (assuming that documentation is submitted supporting the validity of the storage conditions under transit). The registrant-submitted data is also adequate to verify that a food/feed additive tolerance for soybean processed commodities is not necessary.

Note to SRRD: The "(N)" designation should be deleted from all 40 CFR §180.207 entries. The current listings for "vegetables, root" and "vegetables, seed and pod" are inappropriate and should be revised to reflect currently accepted crop groupings. Once tolerances are established for commodities previously included under "vegetables, root (excluding carrots)" and "vegetables, seed and pod," these listings should be deleted from 40 CFR §180.207.

DETAILED CONSIDERATIONS

Residue Analytical Methods

In conjunction with the residue studies, DowElanco and the Trifluralin Data Development Consortium submitted method descriptions (1992; MRIDs 42448201 through 42448204). Trifluralin residues were determined using several related GC/ECD methods, Eli Lilly method AM-AA-CA-R023-AA-755 and DowElanco Method GRM92.11.

Residues of trifluralin in or on sugar beet, green onion, and soybean commodities were determined using method AM-AA-CA-R023-AA-755. This method was previously described in the 7/85 Residue Chemistry Chapter, and is a modification of Method II in PAM, Vol II. In brief, residues in crop samples (excluding oil and soapstock matrices) are extracted with methanol, partitioned into methylene chloride, and cleaned-up by Florisil column chromatography. Residues in oil and soapstock matrices are extracted in hexane, partitioned into acetonitrile (ACN), diluted with 5% NaCl, partitioned back into hexane, and then cleaned-up using a Florisil column. Residues are analyzed by GC/ECD. The reported detection limit is 0.01 ppm for sugar beets, green onions, soybean commodities, and 0.02 ppm for sugar beet dehydrated pulp, molasses, and refined sugar. However, no validation data specific to sugar beet commodities were submitted to support the detection limits.

Residues in or on corn grain were determined using DowElanco Method GRM92.11, which is similar to AM-AA-CA-R023-AA-755 of a corn grain processing study. In method GRM92.11, residues are extracted with hexane, cleaned up using a silica solid phase

extraction (SPE) cartridge eluted with toluene, and then analyzed by GC/ECD. The reported detection limit for trifluralin in corn grain is 0.01 ppm; however, no validation data were submitted to support this limit of detection.

For method validation, sample matrices were fortified with trifluralin at 0.01-0.1 ppm. Method recoveries of trifluralin from each RAC and processed commodity are summarized in Table 1. Sample calculations and chromatograms were provided.

These data indicate that the method AM-AA-CA-R0223-AA-755 is adequate for collecting data on residues of trifluralin in sugar beet, green onion, and soybean commodities and that method GRM92.11 is adequate for collecting data on residues of trifluralin on corn grain.

Table 1. Recoveries of trifluralin from control samples fortified with trifluralin.

Commodity	Fortification Level (ppm)	# of Samples	% Recovery
Sugar beet roots	0.05, 0.1	6	79-100
dehydrated pulp	0.2	6	77-93
molasses	0.2	4	79-95
refined sugar	0.2	4	73-80
Green onions	0.01, 0.05	4	87-123
Soybeans	0.01	1	94
hulls	0.01-0.1	8	92-116
meal	0.01-0.1	8	87-115
grain dust	0.01, 0.05	2	120, 121
soapstock	0.01, 0.05	2	101, 110
crude oil	0.01, 0.05	2	112, 94
refined oil	0.01, 0.05	2	116, 107
Corn grain	0.1	2	93, 99

Storage Stability Data

In conjunction with the submitted residue studies, DowElanco and the Trifluralin Data Development Consortium submitted data (1992; MRID 42448201 through -04) depicting the stability of trifluralin in green onions, corn grain, sugar beets, and soybeans (including processed commodities) stored at approximately -20 °C. As residue samples of the above commodities were placed into frozen storage at the analytical laboratory, control samples were fortified with trifluralin at 0.05 ppm. Recoveries of trifluralin from fortified control samples stored at -20 °C are shown in Table 2, along with the storage intervals for the actual residue samples.

The submitted storage stability data indicate that trifluralin is stable at -20 °C for at least 111 days in sugar beets; 252 days in green onions; 72-78 days in soybean hulls, dust, and oil; 101 days in soybean meal; and 420 days in soybean soapstock. Storage stability data in the current submissions on soybeans and corn grain did not support the entire storage interval for residue samples of these commodities. However, the 10/91 Reregistration Standard Update previously concluded that residues of trifluralin are stable at -20 °C for 192 days in corn grain. These Registration Standard Update data support the stability of trifluralin in the residue samples of corn grain stored for the intervals indicated in the current studies. Together these data adequately support the submitted residue data on green onions and corn grain, and RAC's and processed commodities of sugar beets. In soybeans, the 10/91 Reregistration Standard Update showed that trifluralin residues degraded approximately 30% and 40-45% after 58 and 182 days, respectively, under the storage conditions tested. The storage stability of soybean residues is not adequately supported by either the registrant's submitted study or the 10/91 Registration Standard Update. Nevertheless, the Agency believes that the registrant-submitted storage stability data for soybean *processed* commodities is adequate to support the registrant-submitted *processing* studies: the 7/85 Registration Standard previously concluded that a tolerance of 0.05 ppm for the soybean *rac* is appropriate. No storage stability data are required for processed sugar beet commodities because samples of these commodities were analyzed within 11 days of sampling.

Table 2. Stability of trifluralin in commodities fortified with trifluralin and stored at approximately -20 °C, along with the storage intervals of treated residue samples.

	Fortified Control Samples[a]		Residue Samples[b]
Commodity	Storage Interval (days)	% Recovery	Storage Interval (days)
Sugar beet roots	111	80, 100	97
Green onions	95-252	93-113	25-212
Soybeans	37	94	175
hulls	37, 72	100, 114	61
meal	88, 101	112, 106	112
grain dust	38, 73	122, 120	62
soapstock	219, 420	104, 122	243
crude oil	39, 78	124, 128	63
refined oil	39, 73	114, 120	63
Corn grain	14	83-91	116-142
	158	57-72	

[a] Control samples of sugar beets, green onions, and soybean commodities were fortified at 0.05 ppm, whereas control samples of corn grain were fortified at 0.1 ppm.

[b] Treated residue samples were stored at ≤-10 °C for the intervals indicated.

7

Magnitude of the Residue in Plants

Bulb Vegetables

Green Onions. A tolerance of 0.05 ppm (N) has been established for residues of trifluralin in or on root vegetables, excluding carrots (40 CFR §180.207). A REFs search, dated 10/8/92, of DowElanco's trifluralin labels indicates that trifluralin (formulated as a 4 or 5 lb/gal and an undetermined 80% dry formulation) is currently registered for use on onions. Label directions indicate that trifluralin can be applied to onions (grown for dry bulbs only) at 0.38-0.63 lb ai/A as a directed, postemergence spray that is incorporated into the soil. A 60-day PHI has been established for onions.

DowElanco and the Trifluralin Data Development Consortium submitted data (1992; MRID 42448202) from three tests conducted in AZ(1), CA(1), and TX(1) depicting residues of trifluralin in or on green onions harvested 60 days following a directed, postemergence application of trifluralin at 0.5-0.69 lb ai/A (0.8X, 1.0X, and 1.1X)[1]. Trifluralin (5 lb/gal EC) was applied and incorporated into the soil when onion plants were 1.5-3 inches tall.

Each test site consisted of a control and treated plot. A single control and two treated samples were harvested from each test site. Onion samples were immediately frozen and stored at approximately -20 °C for 25-212 days until extraction and analysis. Trifluralin residues in or on green onions were determined using AM-AA-CA-R023-AA-755. Trifluralin residues ranged from not detected (<0.01) to 0.016 ppm in or on six treated green onion samples harvested 60 days following a directed, postemergence application of trifluralin at 0.8X-1.1X the maximum recommended rate. Apparent residues of trifluralin were nondetectable (<0.01 ppm) in or on three control samples of green onion.

Geographic representation is adequate. The test states of AZ(6%), CA(47%), and TX(33%) accounted for approximately 86% of the U.S. spring onion production in 1990 (Agricultural Statistics, 1990, p. 153). In addition, the Agency (S. Willett, No CBRS No., 10/17/89) previously concluded that three residue trials conducted on green onions in AZ, CA, and TX would be adequate.

These data indicate that trifluralin residues in or on green onions are not likely to exceed the established tolerance (0.05 ppm) for root vegetables following a single postemergence

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[1] The Agency notes that **all** applications should have been at rates equal to or greater than the maximum legal application rate. This was not true in the case of the California trials in which the highest residues (0.016 and 0.012 ppm) were seen. California represents a substantial proportion (47%) of U.S. spring onion production. Nevertheless, the Agency has decided to not to reject these studies on this basis, since these data are being used in support of a 0.05 ppm group tolerance which is a concentration substantially higher than the majority of residue levels found in this study.

application of trifluralin at 0.5-0.69 lb ai/A. No further data are required for green onions. The registrant should propose a group tolerance for bulb vegetables[2]. The available data from garlic and onion (green and dry) indicate that 0.05 ppm is an appropriate level. Once tolerances have been established for commodities previously included in "vegetables, root (excluding carrots)", this listing should be deleted from 40 CFR §180.207.

Cereal Grains

Field Corn Grain. A tolerance of 0.05 (N) ppm has been established for residues of trifluralin in or on corn grain, excluding popcorn, (40 CFR §180.207). Trifluralin (formulated as a 4 or 5 lb/gal EC, 10% G, and an undetermined 80% dry formulation) is currently registered for an over-the-top or directed application at 0.38-1 lb ai/A, depending on soil type, to corn plants that are at least 8 inches tall (2nd true leaf stage). Trifluralin is incorporated into the soil at or shortly after application.

DowElanco and the Trifluralin Data Development Consortium submitted data (1992; MRID 42448201) from three tests conducted in IA(1), IL(1) and OH(1) depicting residues of trifluralin in or on corn grain harvested 93-118 days following an over-the-top application of trifluralin at 1 lb ai/A (1x) that was incorporated into the soil. Trifluralin (4 lb/gal EC) was applied to corn plants that were 23-33 inches tall (six- to nine-leaf stage) using ground equipment at 12-25 gal/A.

Each test site consisted of a control and treated plot. A single control and three treated samples were harvested from each test site. Grain samples were immediately frozen and stored at approximately ≤-13 °C for 116-142 days until extraction and analysis. Trifluralin residues in or on corn grain were determined using DowElanco method GRM92.11. Trifluralin residues were nondetectable (<0.01 ppm) in or on nine treated corn grain samples. Apparent residues of trifluralin were also nondetectable in or on three control samples of corn grain.

Geographic representation is adequate. The test states of IA(20%), IL(17%), and OH(5%) accounted for approximately 42% of the U.S. field corn production in 1990 (Agricultural Statistics, 1990, p. 33) and adequately represent the major corn growing region of the country. In addition, the Agency (S. Willett, No CBRS No., 10/17/89) previously concluded that three residue trials conducted on field corn in IA, IL, and OH would be adequate.

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[2] Representative commodities of the bulb vegetable group are green onions, dry (or bulb) onions, and garlic. The 7/85 Registration Standard indicates that a tolerance of 0.05 ppm for dry onions and for garlic is acceptable. The data reviewed in the current submission indicate that a tolerance of 0.05 ppm for green onions is also acceptable; thus a group tolerance for bulb vegetables is appropriate.

The Agency is concerned with the time delay during shipping from the field to the DowElanco analytic laboratory. For the Iowa, Illinois, and Ohio corn studies, there are 10-, 7-, and 25-day time lapses, respectively, between the date which the residue samples were shipped from the field and the date the sample was received at the DowElanco facility in Indiana. The registrant must explain why delivery was delayed, and demonstrate that adequate storage conditions were maintained. The Agency feels that these shipping times are excessive and is concerned that this extended travel times may have compromised sample integrity (i.e., that storage conditions during transit may not have remained adequate to prevent sample degradation).

These data indicate that trifluralin residues are not likely to exceed the established tolerance of 0.05 ppm for residues of trifluralin in or on corn grain following an over-the-top application of trifluralin at 1X the maximum label rate, provided the registrant is able to demonstrate the validity of the present study by showing that sample integrity was not compromised during the extended shipping periods. If the registrant is able to satisfactorily demonstrate this to the Agency, then no further data are required on field corn grain.

Magnitude of the Residue in Processed Foods/Feeds

Sugar Beet Processed Commodities. A tolerance of 0.05 (N) ppm has been established for residues of trifluralin in or on root vegetables, excluding carrots (40 CFR §180.207). Trifluralin (formulated as a 4 or 5 lb/gal EC, 10% G, and an undetermined 80% dry formulation) is currently registered on sugar beet for an over-the-top, broadcast application at 0.5-0.75 lb ai/A, depending on soil type, when plants are 2-6 inches tall. Trifluralin is incorporated into the soil at or shortly after application.

DowElanco and the Trifluralin Data Development Consortium submitted data (1992; MRID 42448204) from two tests conducted in CA(1) and MN(1) depicting trifluralin residues in or on sugar beets (including processed commodities). In both tests, trifluralin (4 lb/gal EC) was applied to sugar beets at the 4-12 leaf-stage at 3.75 lb ai/A (5x) as an over-the-top, broadcast application that was incorporated into the soil.

Each test consisted of a single control and treated plot. In the CA test, sugar beets were harvested 154 days posttreatment and stored overnight at 7 °C prior to processing. Whole beets and processed commodities were frozen at an unspecified temperature and analyzed within 3-11 days of sampling. In the MN test, sugar beets were harvested 111 days posttreatment and were stored at -10 °C for 97 days prior to processing. After processing samples were stored at -10 °C and were analyzed within 4-7 days. In both tests, sugar beets were processed into dehydrated pulp, molasses, and refined sugar using simulated commercial processes. Trifluralin residues in or on sugar beets and its processed commodities were determined using method AM-AA-CA-R023-AA-755. In both tests, duplicate subsamples of whole beets and single samples of each processed commodity were analyzed. Residues of trifluralin in molasses and refined sugar were nondetectable (<0.02 ppm) and no trifluralin peaks were evident on the sample chromatograms of these

commodities. Residues of trifluralin in or on sugar beet and dehydrated pulp are shown in Table 3. Although residues of trifluralin in or on sugar beets were below the method's reported detection limit (0.01 ppm), peaks corresponding to trifluralin were evident on chromatograms of sugar beet samples; these peaks were used to estimate levels of trifluralin in or on beets. Apparent residues of trifluralin in or on all control samples were nondetectable.

Data from the sugar beet processing study are adequate and indicate that residues of trifluralin concentrated in dehydrated pulp at 4.7-8.8X the level of trifluralin in or on sugar beets. Nevertheless, concentrations in the dehydrated pulp resulting from a 5X exaggerated treatment rate are still below the rac tolerance level of 0.05 ppm, and thus no food additive tolerance is deemed necessary; the rac tolerance will apply to the processed commodity.

Table 3. Trifluralin residues in or on sugar beets and dehydrated pulp following a postemergence, directed application of trifluralin to sugar beets at 5x the maximum registered rate.

	Residues of Trifluralin (ppm)		
Test site	Sugar beets[a]	Dehydrated pulp	Concentration Factor[c]
CA	0.002, 0.008	0.044[b]	8.8x
MN	0.005, 0.006	0.026	4.7x

[a] Residues below the reported detection limit (0.01 ppm) were estimated based on detector response and the standard curve.
[b] Average of four analyses of one sample.
[c] Based on averaged residues in sugar beets and dehydrated pulp.

Soybean Processed Commodities. A tolerance of 0.05 (N) ppm has been established for residues of trifluralin in or on seed and pod vegetables (40 CFR §180.207). Trifluralin, (formulated as a 4 or 5 lb/gal EC, 10% G, and an undetermined 80% dry formulation) is currently registered for a preplant application at 0.5-1.25 lb ai/A to soybeans, depending on soil type. In addition, special use directions for the control of Johnsongrass in soybeans indicate that trifluralin can be applied for two consecutive years as a broadcast preplant application at 1-2 lb ai/A, depending on soil type. Trifluralin is incorporated into the soil at or shortly after application.

DowElanco and the Trifluralin Data Development Consortium submitted data (1992; MRID 42448203) depicting trifluralin residues in or on soybeans and in processed soybean commodities. In a test conducted in MO, trifluralin (4 lb/gal EC) was applied to soybeans at 3.75 lb ai/A as a preplant broadcast application that was incorporated into the soil, which was classified as a silt loam (medium soil texture). The rate applied is 2.5x the maximum

11

label-recommended rate for this soil type and 1.9x the maximum rate for any soil type. The registrant stated that use of "a higher rate was not included in the study because it would likely have resulted in unacceptable crop injury". Soybeans were planted immediately following the trifluralin application. The test consisted of a single control and treated plot. A control and treated sample of soybeans were harvested 120 days posttreatment and immediately frozen. Prior to processing, soybeans were stored at $\leq$-8 °C for approximately 114 days. Soybeans were processed into hulls, meal, soapstock, crude oil and refined oil using a simulated commercial process. In addition, dust samples were collected and composited to yield a grain dust fraction. Based on the weight of the soybeans and each of the resulting processed fractions in this study, theoretical concentration factors for residues in hulls, meal, and oil were approximately 10X, 1.5X, and 6.4X, respectively. After processing, samples were stored at approximately $\leq$-12 °C. The total storage interval for samples prior to extraction and analysis was 61-243 days. Trifluralin residues were determined using method AM-AA-CA-R023-AA-755. A single control and treated sample were analyzed for each soybean commodity. Residues of trifluralin in or on treated soybeans and its processed commodities were nondetectable (<0.01 ppm). Apparent residues of trifluralin were also nondetectable in or on one control sample of soybeans and each processed commodity.

The Agency is concerned with the time delay during shipment from the field to the DowElanco laboratory. For the Missouri study, there was a 14-day time lapse between the date which the residue samples were shipped from the field and the date the sample was received at the DowElanco facility in Indiana. The registrant must explain why delivery was delayed, and demonstrate that adequate storage conditions were maintained. The Agency feels that a 14 day shipping time is excessive and is concerned that this extended travel time may have compromised sample integrity. (i.e., that storage conditions during transit may not have remained adequate to prevent sample degradation).

Although trifluralin was not applied at an exaggerated rate equivalent to the highest theoretical concentration factor (10x for hulls), the use of soybeans bearing nondetectable residues following preplant application of trifluralin at 1.9X the maximum tolerable rate is acceptable: in this case, no overtolerance residues were seen in any of the processed commodities following application at the maximum tolerable rate (i.e., 1.9X the maximum label rate); the rac tolerance is assumed to apply to the processed commodities. If the registrant demonstrates that the 1.9X rate is the highest rate tolerated by soybeans and that the conditions during the 14 day shipment period were adequate to prevent sample degradation, then these data are acceptable and no food/feed additive tolerances will be required for trifluralin residues in or on soybean grain dust or soybean processed commodities.

References

Citations for the MRID documents referenced in this review are presented below. Submissions reviewed in this document are indicated by shaded type.

42448201 Decker, O.; Morgan, R.; Shackleford, D. (1992) Crop Residue Study with Trifluralin on Field Corn Grain: Lab Project Number: AAC9010. Unpublished study prepared by DowElanco. 115 p.

42448202 Decker, O.; Ervick, D. (1992) Magnitude of the Residue of Trifluralin in Green Onion: Lab Project Number: AAC9042. Unpublished study prepared by DowElanco. 155 p.

42448203 Decker, O.; Morgan, R. (1992) Processing Study with Trifluralin on Soybeans: Lab Project Number: AAC9005. Unpublished study prepared by DowElanco. 177 p.

42448204 Decker, O.; Ervick, D. (1992) Determination of Trifluralin Residues in Sugar Beets and Processed Products: Lab Project Number: AAC8817. Unpublished study prepared by DowElanco. 56 p.

Agency Memoranda

CBRS No. None
Subject: Trifluralin Registration Standard Follow-up. DEB Response to Elanco Letter dated 7/21/89.
From: S. Willett
To: L. Rossi
Dated: 10/17/89
MRID(s): None.