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

JUL 23 1992

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OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

MEMORANDUM

SUBJECT: Review of New Chemical Screen for XRM-5313
CAS Reg. No.: 98967-40-9/1582-09-8
Chemical code: 129016

TO: J. Miller/S. Robbins
Product Manager #23
Registration Division (H7505C)

THRU: Paul Mastradone, Chief
Chemistry Review Section #1
Environmental Fate and Ground Water Branch (H7507C)

THRU: Hank Jacoby, Chief
Environmental Fate and Ground Water Branch
Environmental Fate and Effects Division (H7507C)

FROM: Gail Maske, Chemist
Chemical Review Section #1
Environmental Fate and Ground Water Branch (H7507C)

EFGWB has been requested to reevaluate the new chemical screen for XRM-5313 (WGM; March 1992) for use of XRM-5313 on corn and soybeans to control broadleaf weeds and annual grasses. XRM-5313 is the trade name used for an end use product containing two active ingredients, XRD-498 and trifluralin. XRM-5313 failed the original new chemical screen (WGM;March 1992), due to concerns addressed with environmental fate studies submitted to support registration of XRD-498 and reregistration of trifluralin. DowElanco submitted data in response to these concerns which were reviewed by EFGWB (WGM; 07/ /92) in July 1992. Therefore, upon reevaluating the data base for the terrestrial food and feed use pattern, there is sufficient data for XRM-5313 to marginally pass the new chemical screen.

In addition, unlike most new chemical screens, most of the data requirements for XRM-5313 have been reviewed in detail.

There is one data requirement for Section 3 registration of XRD-498, the accumulation in confined rotational crop (165-1), for XRD-498 which is considered supplemental. Therefore, XRM-5313 is being reviewed for use on target crops only with no rotation of crops at this time. A brief summary of additional data in support of the confined rotational crop was submitted in the response to the new chemical screen review (WGM;March 1992). However, the confined rotational crops data requirement can not be reevaluated until this additional data is submitted for review..

Even though trifluralin is registered, it is presently going through reregistration. Therefore, the environmental fate data for trifluralin is being reevaluated.[1]

[1]Note: The environmental fate of XRD-498 and trifluralin was used to determine the environmental fate of XRM-5313.

ENVIRONMENTAL FATE ASSESSMENT XRD-498

Based upon a review of the submitted studies for both the [^{14}C-aniline]XRD and the [^{14}C-pyrimidine]XRD ring, XRD-498 appears to be persistent (hydrolysis-$t_{1/2}$=>>60 days, photodegradation-$t_{1/2}$=84-90 days, aerobic soil metabolism-2 to 3 months, anaerobic aquatic metabolism-183 days, field dissipation-$t_{1/2}$=1.5 to 3 months) and very mobile (in twenty-three soils-ranging in texture from sandy loam to clay-the adsorption coefficients (K_d) ranged from 0.05 to 2.42, and K_{oc} values ranged from 5 to 182). There were numerous minor degradates which were reported at concentrations of <0.01 ppm.

In summary, XRD-498 may exhibit some leaching in the environment. Therefore, it has the possibility of reaching ground-water. Also its persistence makes it a possible surface water contaminate. However, XRD-498 does appear to degrade faster in soils with higher pH and lower organic carbon content.

Based on an octanol/water coefficient of 1.62, XRD-498 is not expected to accumulate in fish. However, the confined rotational crops data indicates that XRD-498 residues may accumulate at concentrations of ≈≤10 ppb in rotational crops planted at 365 day posttreatment and ≈≤100 ppb in rotational crops planted at 30- and 120-days posttreatment) in rotational crops.

ENVIRONMENTAL FATE OF TRIFLURALIN

There is insufficient data to fully assess the environmental fate of trifuralin at this time. This assessment is based upon a review of the submitted data, some of which were found to be supplemental. The registrant needs to address the concerns discussed in the reviews of supplemental environmental fate studies so that the metabolism, mobility, and degradation of trifuralin can be fully understood.

of applied degraded); but the aerobic soil metabolism ($t_{1/2}$=77 to 126 days depending on soil type), photodegradation in water (half-lives of 8.9 hours), photodegradation on soil ($t_{1/2}$=41 days), anaerobic soil metabolism ($t_{1/2}$=25-29 days) half-lives were reported. Unaged trifluralin was reported to be mobile in sand, sandy loam, and loam soils and slightly mobile in clay loam. Aged trifluralin residues were reported to be sightly mobile in sand and loam soils. The Freundlich K_{ads} values ranged from 18.0 to 19.0 for the sand soil, 52.5 to 56.3 for the sandy loam soil, 81.8 to 98.8 for the loam soil, and 124.7 to 155.6 for the clay loam soil. The K_{des} values ranged from 24.3 to 36.9 for the sand soil, 66.4 to 93.2 for the sandy loam soil, 117.2 to 244.7 for the loam soil, and 132.1 to 238.1 for the clay loam soil. Following leaching of aged residues [2-ethyl-7-nitro-1-propyl-5-(trifluoromethyl)benzimidazole, α,α, α-trifluoro-2,6-dinitro-N-propyl-p-toluidine, α,α,α-trifluoro-5-nitro-N4-propyl-toluene-3,4-diamine, 2-ethyl-7-nitro-1-propyl-5-(trifluoromethyl)benzimidazole-3-oxide, 2-ethyl-7-nitro-5-(trifluoromethyl)benzimidazole, α,α,α-trifluoro-2,6-dinitro-p-cresol, 2, 2'-azoxy-bis(α,α,α-trifluoro-6-nitro-N-propyl-p-toluidine, were identified in the metabolism studies] in soil columns, the total radioactivity was, 1.65 to 4.8% in the 6 to 12 cm segment, 0.77 to 1.27% in the 12 to 18 cm segment, and ranged between 0.16 to 0.64 in the remaining segments. In the leachate the total radioactivity was 0.65 to 2.57% of the applied radioactivity. In field dissipation studies, trifluralin was not detected in samples taken below 6 inches.

In summary, the results of the metabolism studies demonstrated that the dissipation rate of trifluralin in soil is rather slow in sandy loam, loam, clay loam, and clay soils, and that volatilization may contribute to the dissipation rather than degradation. Volatilization appears to be controlled to a large extent by soil moisture and temperature (increases with temperature-WGM;08/91) However, trifluralin did not volatilize when applied in a pesticide mixture. For the reasons stated above - tight adsorption of trifluralin and enhanced decay due to moist conditions (volatilization) and surface application (photolysis)- trifluralin would not be expected to leach under certain environmental conditions. However, trifluralin is sometimes incorporated into the soil; therefore, these modes of degradation may be insignificant.

Furthermore, trifluralin residues accumulated in Swiss chard, turnips, corn, and winter wheat planted in treated sandy loam soil. Accumulation was greatest (up to 0.086 ppm) in crops planted at 30 days posttreatment. In crops planted at 108 days posttreatment trifluralin residues were not detected in Swiss chard leaves and turnip roots and leaves. In addition, trifluralin residues accumulated in fish with maximum mean BCF of 2041X, 9586X, and 5674X for edible, nonedible, and whole fish, respectively. However, depuration was 86.4 to 88.0% of the accumulated residues when exposed to pesticide-free water for 14 days.

The status of the Environmental Fate Data Requirements for XRD-498 for terrestrial food and feed crops use pattern is as follows:

Environmental Fate Data Requirement	Status of Data Requirement	MRID No.
Degradation Studies-Lab		
161-1 Hydrolysis	Fulfilled (WGM;02/02/90)	41263229
161-2 Photodegradation in water	Fulfilled (GJT;03/24/92)	41931726 41931727
161-3 Photodegradation on soil	Fulfilled (WGM;03/24/92)	41931728 41931729 41931730
161-4 Photodegradation in air	Not Submitted[1]	
Metabolism Studies-Lab		
162-1 Aerobic soil	Fulfilled (WGM;06/22/90) (WGM;03/24/92) (WGM; /92)	41263230 41931731 41931732
162-3 Anaerobic aquatic	Fulfilled (WGM;03/24/92) (WGM; /92)	41931733
Mobility Studies		
163-1 Leaching, Adsorption/ Desorption	Fulfilled[2] (WGM;06/22/90)	41263231 41290403
163-2 Volatility-lab	Not Submitted[1]	
163-3 Volatility-field	Not Submitted[1]	
Dissipation Studies-field		
164-1 Soil	Fulfilled (WGM;03/24/92) (WGM; /92)	41931735
Accumulation Studies		
165-1 Rotational crops-confined	Not Fulfilled[2&3] (WGM;02/02/90) (WGM;03/24/92) (WGM; /92)	41263232 41931739
165-4 in Fish	Waived (WGM;06/22/90)	

[1] Based on the low vapor pressure (0.8×10^{-15} mm Hg) and toxicological classification of ≥3, there would be sufficient data to support a waiver request for these studies.

[2] Based on insufficient data to support the rotational crop data requirement, there should be no rotation of crops.

[3] New chemical screens should include a complete data package. This data package is reviewed as acceptable data for the respective data requirements.

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The current status of environmental fate data requirements to support the registration of **trifluralin** for use to control annual grasses and broadleaf weeds in terrestrial food and feed crops is as follows:

Environmental Fate Data Requirements	Status of Data Requirement	MRID No.
Degradation Studies-lab		
161-1 Hydrolysis	Fulfilled[3] (NKW;01/17/84) (DYNAMAC;07/11/85)	00131135
161-2 Photodegradation in water	Fulfilled (DYNAMAC;07/11/85) (WGM;08/ /91)	00094029 40560101
161-3 Photodegradation on soil	Fulfilled (DYNAMAC;07/11/85) (WGM;08/ /91)	00041576 00094807 00105759B 00105772G 40597801 40551301
161-1 Photodegradation in air	Reserved[1]	
Metabolism Studies-lab		
162-1 Aerobic soil	Not Fulfilled (DYNAMAC;07/11/85) (WGM;08/ /91)	00105759A 00105772C 00105772D 00105772G 00105772H 00124024 41240501
162-2 Anaerobic soil	Not Fulfilled (DYNAMAC;07/11/85) (WGM;08/ /91)	00002814 00105772G 00124024 41240502
Mobility Studies		
163-1 Leaching, Adsorption/ Desorption	Partially (DYNAMAC reviewed numerous studies none of which were acceptable) (WGM;07/11/91)	40673501
163-2 Volatility-Lab	Not Fulfilled (DYNAMAC;07/11/85) (WGM;08/ /91)	00105759E-F 00124914 40673601A-C
163-3 Volatility-field	Not Fulfilled[1] (WGM;08/ /91)	40673601D-G

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Environmental Fate Data Requirements	Status of Data Requirement	MRID No.
Dissipation Studies-field		
164-1 Soil	Fulfilled (DYNAMAC reviewed numerous studies none of which were acceptable) (WGM;07/11/91)	41661101 41781901
Accumulation Studies		
165-1 Confined rotational crops	Not Fulfilled (NKW;01/17/84) (DYNAMAC;07/11/85) (WGM;08/??/91)	00131136 41661102
165-2 Field rotational crops	Reserved[2]	
165-4 in Fish	Not Fulfilled (DYNAMAC;07/11/91) (WGM;08/ /91)	00094030 00098842 00105772K 40673801

[1] The photodegradation in air and the field volatility studies are reserved pending the evaluation of an acceptable volatility-lab (163-2) study.

[2] The accumulation in field rotational crops is reserved pending the evaluation of an acceptable confined rotational crops study.

[3] There is a discrepancy between the hydrolytic half-live reported and the photolytic dark control half-life for aqueous photodegradation (no degradation vs 19.1 days, respectively). The reason for the difference is not apparent and the registrant needs to address this difference.

FEB FILE

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

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MEMORANDUM

SUBJECT: Review of New Chemical Screen for XRD-498 and XRM-5019
CAS Reg. No.: 98967-40-9/1582-09-8
Chemical code: 129016

TO: J. Miller/S. Robbins
Product Manager #23
Registration Division (H7505C)

THRU: Paul Mastradone, Chief
Chemistry Review Section #1
Environmental Fate and Ground Water Branch (H7507C)

THRU: Hank Jacoby, Chief
Environmental Fate and Ground Water Branch
Environmental Fate and Effects Division (H7507C)

FROM: Gail Maske, Chemist
Chemical Review Section #1
Environmental Fate and Ground Water Branch (H7507C)

EFGWB has been requested to reevaluate the new chemical screen for XRD-498 (WGM; March 1992) for use of XRM-5019 on corn and soybeans to control broadleaf weeds and annual grasses. Based on concerns addressed with the aerobic soil metabolism, anaerobic aquatic metabolism, leaching, adsorption/desorption, terrestrial field dissipation, and the confined rotatioal crops studies, XRD-498 and XRM-5019 failed the original new chemical screen (WGM;March 1992). DowElanco submitted data in response to these concerns which were reviewed by EFGWB (WGM; 07/ /92) in July 1992. Therefore, upon reevaluating the data base for the terrestrial food and feed use pattern, there is sufficient data for XRD-498 and XRM-5019 to marginally pass the new chemical screen.

Unlike most new chemical screens, many of the data requirements for XRD-498 has been reviewed in detail. Only one of the data requirements for Section 3 registration of XRD-498 (the confined rotation crops (165-1) data requirement) is

considered supplemental. Therefore, XRD-498 and XRM-5019 are being reviewed for use on target crops only with no rotation of crops at this time. A brief summary of additional data in support of the confined rotational crop was submitted in the response to the new chemical screen review (WGM;March 1992). However, the confined rotational crops data requirement can not be reevaluated until this additional data is submitted for review.

ENVIRONMENTAL FATE ASSESSMENT XRD-498

Based upon a review of the submitted studies for both the [^{14}C-aniline]XRD and the [^{14}C-pyrimidine]XRD ring, XRD-498 appears to be persistent (hydrolysis-$t_{\frac{1}{2}}$->>60 days, photodegradation-$t_{\frac{1}{2}}$=84-90 days, aerobic soil metabolism-2 to 3 months, anaerobic aquatic metabolism-183 days, field dissipation-$t_{\frac{1}{2}}$=1.5 to 3 months) and very mobile (in twenty-three soils-ranging in texture from sandy loam to clay-the adsorption coefficients (K_d) ranged from 0.05 to 2.42, and K_{oc} values ranged from 5 to 182). There were numberous minor degradates which were reported at concentrations of <0.01 ppm.

In summary, XRD-498 may exhibit some leaching in the environment. Therefore, it has the possibility of reaching ground-water. Also its persistence makes it a possible surface water contaminate. However, XRD-498 does appear to degrade faster in soils with higher pH and lower organic carbon content.

Based on an octanol/water coefficient of 1.62, XRD-498 is not expected to accumulate in fish. However, the confined rotational crops data indicates that XRD-498 residues may accumulate at concentrations of ≈≤10 ppb in rotational crops planted at 365 day posttreat-ment and ≈≤100 ppb in rotational crops planted at 30- and 120-days posttreatment) in rotational crops.

The status of the Environmental Fate Data Requirements for XRD-498 for terrestrial food and feed crops use pattern is as follows:

Environmental Fate Data Requirement		Status of Data Requirement	MRID No.
Degradation Studies-Lab			
161-1	Hydrolysis	Fulfilled (WGM;02/02/90)	41263229
161-2	Photodegradation in water	Fulfilled (GJT;03/24/92)	41931726 41931727
161-3	Photodegradation on soil	Fulfilled (WGM;03/24/92)	41931728 41931729 41931730
161-4	Photodegradation in air	Not Submitted[1]	
Metabolism Studies-Lab			
162-1	Aerobic soil	Fulfilled (WGM;06/22/90) (WGM;03/24/92) (WGM; /92)	41263230 41931731 41931732
162-3	Anaerobic aquatic	Fulfilled (WGM;03/24/92) (WGM; /92)	41931733
Mobility Studies			
163-1	Leaching, Adsorption/ Desorption	Fulfilled[2] (WGM;06/22/90)	41263231 41290403
163-2	Volatility-lab	Not Submitted[1]	
163-3	Volatility-field	Not Submitted[1]	
Dissipation Studies-field			
164-1	Soil	Fulfilled (WGM;03/24/92) (WGM; /92)	41931735

Accumulation Studies

165-1	Rotational crops-confined	Not Fulfilled[2&3] (WGM;02/02/90) (WGM;03/24/92) (WGM; /92)	41263232 41931739
165-4	in Fish	Waived (WGM;06/22/90)	

[1] Based on the low vapor pressure (0.8×10^{-15} mm Hg) and toxicological classification of ≥3, there would be sufficient data to support a waiver request for these studies.

[2] Based on insufficient data to support the rotational crop data requirement, there should be no rotation of crops.

[3] New chemical screens should include a complete data package. This data package is reviewed as acceptable data for the respective data requirements.