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EFGWB File 7/26/93

DP Barcode: D189768
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TO: Joanne I. Miller
Fungicide-Herbicide Branch
Registration Division (H7505)

FROM: Mah Shamim, Ph.D., Acting Chief
Environmental Chemistry Review Section #2
Environmental Fate and Groundwater Branch (H7507C)

JUL 2 1 1993

THROUGH: Henry Jacoby, Chief
Environmental Fate and Groundwater Branch
Environmental Fate and Effects Division (H7507C)

Henry Jacoby 7/26/93

Attached, please find the EFGWB review of:

Reg./File #(s) : N. A.

Common Name : V-53482, S-53482, flumioxazin

Chemical Name : 7-fluoro-6-[(3,4,5,6-tetrahydro)phthalimide]-4-(2-propynyl)-1,4-benzonazine-3(2H)-one

Product Type : Herbicide

Product Name : V-53482 WP, V-53482 WDG Herbicide

Company Name : Valent U.S.A. Corporation

Purpose : Review of data requirements for an Experimental Use Permit for a mixer loader and application/exposure study. Review of Hydrolysis, Aerobic Soil Metabolism, and Mobility of of aged and unaged V-53482. Waiver request of the Bioaccumulation in Fish data requirement.

Action Code: 700 EFGWB #(s): 93-0573

EFGWB Guideline/MRID/Status Summary Table:
The review in this package contains...

161-1	42697501, 42684905	Y	162-4			164-4			166-1		
161-2			163-1	42684907, 42684908, 42684909	P	164-5			166-2		
161-3			163-2			165-1			166-3		
161-4			163-3			165-2			167-1		
162-1	42684906	P	164-1			165-3			167-2		
162-2			164-2			165-4			201-1		
162-3			164-3			165-5			202-1		

Y = Acceptable (Study satisfied the Guideline)/Concur P = Partial (Study partially satisfied the Guideline, but additional information is still needed)
S = Supplemental (Study provided useful information, but Guideline was not satisfied) N = Unacceptable (Study was rejected)/Non-Concur

CAL:

Common name:

V-53482, S-53482
Flumioxazin (proposed)

Chemical name(s):

7-fluoro-6[(3,4,5,6-tetrahydro)phthalimide]-4-(2-propynyl)-1,4-benzonazine-3(2H)-one

Trade name(s):

V-53482 WP Herbicide, V-53482 WDG Herbicide

Formulations:

Wettable powder and wettable dispersable granule

Physical/Chemical properties:

Molecular formula:	$C_{19}H_{15}FN_2O_4$
Molecular weight:	354.34 g/mol
Physical state:	Solid
Melting point:	201.8 - 203.8°C
Solubility:	1.79 mg/L in water at 25°C
	1.78 g/100 mL in ethyl acetate
	0.156 g/mL in methanol
	0.00247 g/mL in hexane
	0.0163 g/mL in n-octanol
	1.70 g/mL in acetone
	3.23 g/mL in acetonitrile
	19.1 g/mL in dichloromethane
	5.38 g/mL in tetrahydrofuran
Octanol/Water Part. Coef.:	Log K_{ow} = 2.55 at 20°C
Vapour pressure:	2.41 x 10^{-6} mm Hg at 22°C

2. TEST MATERIAL:

Refer to individual DER's for details.

3. STUDY/ACTION TYPE:

The registrant submitted a request for an Experimental Use Permit for a mixer loader and application/exposure study of chemical S-53482; in addition, review of Hydrolysis, Aerobic Soil Metabolism, and Mobility and Leaching studies; review of a waiver request of the Bioaccumulation in Fish data requirement.

4. STUDY IDENTIFICATION:

Radcliffe, M. M. 1993. Summary of Data and Application Submitted to Support an Experimental Use Permit for V-53482 WP Herbicide for Non-Crop Use to Perform a Mixer/Loader and Applicator Exposure Study. Valent Project No. W-482-3. Unpublished report submitted by Valent U.S.A. Corporation, CA (No MRID number)

Katagi, T., N. Takahashi, K. Nambu, and H. Yamada. 1990. Hydrolysis of [Ph-^{14}C]-S-53482 in Buffered Aqueous Solutions. Laboratory project ID HYD89001. Unpublished study performed by Biochemistry and Toxicology Laboratory, Sumitomo Chemical Co., Ltd., Japan, and submitted by Valent U.S.A. Corporation, CA, (MRID# 42697501)

Katagi, T., N. Takahashi, K. Nambu, and H. Yamada. 1990. Hydrolysis of [THP-^{14}C]-S-53482 in Buffered Aqueous Solutions. Laboratory project ID HYD89001. Unpublished study performed by Biochemistry and Toxicology Laboratory, Sumitomo Chemical Co., Ltd., Japan, and submitted by Valent U.S.A. Corporation, CA, (MRID# 42684905)

Fathulla, R. N. 1991. Aerobic Soil Metabolism of ^{14}C-S-53482. Laboratory project ID HLA 6311-104. Unpublished study performed by Hazelton Laboratories America, Inc., WI, and submitted by Valent U.S.A. Corporation, CA (MRID# 42684906)

Fathulla, R. N. 1992. Column Leaching Characteristics of [Phe-^{14}C]-V-53482 in Typical Agricultural Soils (Unaged Study). Laboratory project ID HLA 6320-102. Unpublished study performed by Hazelton Laboratories America, Inc., WI, and submitted by Valent U.S.A. Corporation, CA (MRID# 42684907)

Fathulla, R. N. 1992. Column Leaching Characteristics of [THP-^{14}C]-V-53482 in Typical Agricultural Soils (Unaged Soils). Laboratory project ID HLA 6320-104. Unpublished study performed by Hazelton Laboratories America, Inc., WI, and submitted by Valent U.S.A. Corporation, CA (MRID# 42684908)

Fathulla, R. N. 1992. Column Leaching Characteristics of [Phe-^{14}C]-V-53482 in Typical Agricultural Soils (Aged Soils). Unpublished study performed by Hazelton Laboratories America, Inc., WI, and submitted by Valent U.S.A. Corporation, CA (MRID# 42684909)

Wustner, D. A. 1993. Bioaccumulation in Fish of V-53482 Waiver Request 165-4. Laboratory project ID W-482-2. Unpublished report submitted by Valent U.S.A. Corporation, CA (MRID# 42684910)

5. REVIEWED BY:

José Luis Meléndez
Chemist
EFGWB/EFED/OPP
Review Section #2

Signature: José Luis Meléndez

Date: 7/21/93

6. APPROVED BY:

Mah Shamim, Ph.D.
Acting Chief
EFGWB/EFED/OPP
Review Section #2

Signature: M Shamim

Date: JUL 21 1993

7. CONCLUSIONS:

Experimental Use Permit

The registrant, Valent U.S.A. Corporation, has submitted an EUP application for V-53482 WP Herbicide to perform mixture/loader and application exposure studies according to guideline numbers 133-3 and 133-4. EFGWB has no data requirements for the specific use and the aforementioned guidelines probably belong to OREB.

Along with this EUP application, the registrant has also submitted a number of environmental fate laboratory studies for V-53482. Although at this time EFGWB has no data requirements for the chemical, the branch has reviewed the studies. The registrant could use these studies to satisfy the data requirements for the full registration of the chemical. The status of the submitted studies appears in the following table:

Data requirement[1]		Status
161-1	Hydrolysis	Satisfied
162-1	Aerobic Soil Metabolism	Partially Satisfied
163-1	Mobility, Leaching and Adsorption/Desorption	Partially Satisfied
165-4	Bioaccumulation in Fish	Waived

1. The intended use pattern for the chemical is Terrestrial Food.

161-1 Hydrolysis (MRID#'s 42697501 and 42684905)

These studies are acceptable and can be used to satisfy the Hydrolysis data requirement. No additional data are required.

[Ph-^{14}C]-S-53482 (uniformly ring labeled), and [THP-^{14}C]-S-53482 (labeled at the 1- and 2- positions of the 3,4,5,6-tetrahydrophthalimide moiety), at 0.1 ppm, degraded in pH 5, 7 and 9 buffered aqueous solutions that were incubated at 25±1°C in the dark for 30 days. The average calculated half-lives ranged from 3.4-5.1 days, 21.4-24.6 hours, and 14.6-22.0 min. for the pH 5, 7, and 9 buffered solutions, respectively.

Hydrolysis of [Ph-^{14}C]-S-53482

Two degradates were observed;

7-Fluoro-6[(2-carboxy-cyclohexenoyl)amino]-4-(2-propynyl)-1,4-benzoxazin-3(2H)-one (482-HA) was a maximum of 5.2-5.4% of the applied at the 8th hour in the pH 5 buffered solutions, 58.2-60.2% at day 4 in the pH 7 solution, and it was the only degradate at pH 9, reaching around 100% of the applied by day 1 of the study.

A second degradate;

6-Amino-7-fluoro-4-(2-propynyl)-1,4-benzoxazin-3(2H)-one (APF) was a maximum of 82.2-90.0% of the applied at day 21 in the pH 5 solution, 77.8-82.2% at 30 days in the pH 7 solution, and was not detected (<0.1%) in the pH 9 solution.

Hydrolysis of [THP-^{14}C]-S-53482

Three degradates were observed;

482-HA was a maximum of 5.1-6.7% of the applied at the 8th hour in the pH 5 buffered solution, 68.4-70.3% at day 2 in the pH 7 solution, and was the only degradate at pH 9, reaching around 98% at day 1 of the study.

The degradate,

3,4,5,6-tetrahydrophthalic acid (THPA) was 94.6-96.6% of the applied at day 30 in the pH 5 buffered solution, 83.1-84.2% in the pH 7 solution, and was not detected in the pH 9 solution.

The degradate,

3,4,5,6-Tetrahydrophthalic acid anhydride ($^{1}\Delta$-TPA) was a maximum of 1.5-8.8% of the applied at day 21 in the pH 5 buffered solution, 3.6-8.7% at day 14 in the pH 7 solution, and was not detected in the pH 9 solution.

162-1 Aerobic Soil Metabolism (MRID# 42684906)

This study is scientifically sound and partially satisfies the data requirement by providing information about the aerobic soil metabolism of [Ph-^{14}C]-V-53482. This study was conducted using only phenyl ring-labeled V-53482. To fully satisfy the aerobic soil metabolism data requirement, the registrant should submit an additional aerobic soil metabolism study using THP-ring labeled V-53482.

The structure of V-53482 consists of two major moieties; one of them was radiolabeled in this study (the phenyl ring). The other one is the 3,4,5,6-tetrahydrophthalimide (THPA) moiety. Results of the hydrolysis study demonstrated that at least two additional degradates could be present in metabolism processes (THPA and Δ^1-TPA). The presence of these products under aerobic soil metabolism processes cannot be confirmed if only phenyl-ring labeled V-53482 is analyzed. To satisfy the data requirement, an additional study using [THP-^{14}C]-V-53482 is required.

[^{14}C]-V-53482 (uniformly phenyl ring labeled), at 0.26 µg/g, degraded with a registrant-calculated half-life of 11.9 days in a California sandy loam soil incubated in the dark at 22-26°C.

V-53482 was 92.9% of the applied at day 0 and decreased to 18.0% by day 28 and was ≤3.7% of the applied from day 89 posttreatment. $^{14}CO_2$ comprised 2.3% of the applied at day 0 and 11.5% of the applied at day 181 posttreatment. Chromatographic analysis of the sample extracts showed the presence of at least five minor unidentified components, each one was ≤10.9% of the applied.

Soil-bound residues increased from 0.7% of the applied at day 0 to 52.7% by day 28 and 73.6% of the applied by day 181. Extensive reflux extraction of the soil-bound residues showed additional amounts of parent V-53482 at concentrations ≤9.2% of the applied. It also showed the presence of at least four other unidentified minor components, each one was ≤3.5% of the applied. The humic acid, fulvic acid, and humin fractions in the soil-bound residues ranged from 3.1-12.9%, 2.3-7.6%, and 7.4-24.9% of the applied, respectively.

163-1 Mobility and Column Leaching of Unaged S-53482 (MRID#'s 42684907 and 42684908)

This study is acceptable and can be used to partially satisfy the Mobility in Soils (163-1) data requirement. No additional data on the mobility of parent V-53482 are required.

The mobility of unaged [^{14}C]-V-53482 (uniformly phenyl ring labeled, and labeled in the 1- and 2-positions of the 3,4,5,6-tetrahydrophthalimido moiety) was low to high in 36-cm soil leaching columns, using four soil types. The soils were treated at an application rate of approximately 0.26 µg/g, which is about three times the maximum field application rate. The average calculated values obtained are as follows:

Soil	[Ph-^{14}C]			[THP-^{14}C]		
	R_f	K_d	K_{oc}	R_f	K_d	K_{oc}
Plainfield sand	0.61	0.465	265	0.59	0.484	277
California College sandy loam	0.56	0.833	118	0.57	0.744	105
Mississippi silt loam	0.15	11.0	1705	0.30	4.37	675
Kewaunee clay loam	0.08	24.0	816	0.11	14.6	497

The material balance was 92.3-102.8% of the applied. The majority of the radioactivity detected was identified as parent V-53482. Several minor degradation components were present at ≤10% of the applied.

Based on K_{oc} values, [Ph-^{14}C]-V-53482 showed low mobility in a Mississippi silt loam and a Kewaunee clay loam soils, moderate mobility in a Plainfield sand, and high mobility in a California College sandy loam soil. [^{14}C] residues in the leachate fractions totaled 63.0-71.8%, 48.0-54.1%, 5.5-9.0%, and 2.4-3.6% of the applied for the Plainfield sand, California College sandy loam, Mississippi silt loam, and Kewaunnee clay loam soils, respectively.

Based on K_{oc} values, [THP-^{14}C]-V-53482 showed moderate mobility in a Plainfield sand, low mobility in a Mississippi silt loam soil and Kewaunee clay loam soils, and high mobility in a California College sandy loam soil. [^{14}C] residues in the leachate fractions totaled 58.5-69.1%, 51.9-57.0%, 14.8%, and 4.4-5.4% of the applied for the Plainfield sand, California College sandy loam, Mississippi silt loam, and Kewaunnee clay loam soils, respectively.

163-1 Mobility and Column Leaching of Aged S-53482 (MRID# 42684909)

This study is scientifically sound and partially satisfies the data requirement by providing information about the mobility of aged [^{14}C-Ph]-V-53482. This study was conducted using <u>only</u> phenyl ring-labeled V-53482. To satisfy the mobility of aged V-53482 on soils data requirement, the registrant should submit a mobility study using aged [^{14}C-THP]-V-53482.

The structure of V-53482 consists of two major moieties; one of them was radiolabeled in this study (the phenyl ring). The other one is the 3,4,5,6-tetrahydrophthalimide (THPA) moiety. Results of the hydrolysis study demonstrated that two additional degradates <u>could</u> be present in metabolism processes (THPA and Δ-TPA). The presence of these products under aerobic soil metabolism conditions could not be confirmed since only phenyl-ring labeled V-53482 was used.

In addition, the parent compound was aged in soils for 30 days under aerobic conditions. After this period only 31.3% of the radioactivity remained as parent compound. According to Subdivision N Guidelines, the test substance should be applied to the soil and incubated aerobically for 30 days or one half-life, whichever is shorter. The registrant indicated that 30 days was the test interval when the largest amount of polar metabolites were produced in the aerobic soil metabolism study.

Since the results of the aerobic soil metabolism showed that there were no major metabolites formed during aerobic incubation, EFGWB will require no additional data on the mobility of aged [^{14}C-Ph]-V-53482. However, a new study will be required on the mobility of aged [^{14}C-THP]-V-53482 if the results of the Aerobic Soil Metabolism show the presence of major degradates.

[Ph-^{14}C]-V-53482 (uniformly ring labeled) residues remain mainly in the soil of leaching columns packed with a California College sandy loam and a Mississippi silt loam soils. The California College sandy loam soil was treated with 0.249-0.260 µg/g, then aged for 30 days in the dark at 25-26°C and 75% field moisture capacity.

In the soil columns packed with California College sandy loam soil 52.9-53.3% of the applied was recovered from the uppermost column section (section number 0), 6.2-6.4% of the applied from section number 1, 2.8-3.6% of the applied from section number 2, 2.3-2.6% of the applied from section number 3, 1.9-2.4% of the applied from section number 4, and 1.9-2.0% of the applied from section number 5. Residues in the leachate totaled 27.8-28.1% of the applied. Most of the leachate radioctivity was located in the second leachate fraction, with 16.7-17.4% of the applied.

In the soil columns packed with Mississippi silt loam soil 58.6-61.9% of the applied was recovered from the uppermost column section (section number 0), 18.1-22.0% of the applied from section number 1, 4.5-4.8% of the applied from section number 2, 1.9-2.1% of the applied from section number 3, 1.3-1.5% of the applied from section number 4, and 1.1% of the applied from section number 5. Residues in the leachate totaled 6.1-6.5% of the applied. Most of the leachate radioactivity was located in the second leachate fraction, with 2.8-3.1% of the applied.

165-4 Request for a Waiver of the Bioaccumulation in Fish data requirement (MRID# 42684910)

EFGWB concurs with the waiver request for the Bioaccumulation in Fish data requirement.

The following arguments were presented by the registrant to base this waiver request:

- V-53482 degrades rapidly in water (half-life of about 1 day at pH 7 and about 20 min. at pH 9).

- The observed octanol/water partition coefficient for V-53482 is smaller than 1000 (log K_{ow} = 2.55, K_{ow} = 355, value not confirmed).

- The estimated octanol/water partition coefficient (using the Hansch-Leo Method) for the three major hydrolysates of V-53482 are significantly smaller than 1000. Results are as follows:

Hydrolysate	log K_{ow}	K_{ow}
482-HA	0.804	6.4
APF	0.127	1.3
THPA	0.880	7.6

- The aerobic soil metabolism study shows that V-53482 degradates are tightly bound to the soil and could not be desorbed into surrounding waters.

Based upon the data provided, it is concluded that V-53482 and its hydrolysates are not likely to bioaccumulate in fish. Therefore, EFGWB concurs with the requested waiver for the data requirement.

8. RECOMMENDATIONS:

Inform the registrant that EFGWB has no objections with an Experimental Use Permit to perform a mixer/loader and applicator exposure study of S-53482.

At this time, EFGWB has no data requirements for V-53482. However, EFGWB reviewed the studies submitted by the registrant. The results from the studies may be used to satisfy the data requirements for the chemical at the time of registration.

Inform the registrant that the following studies are acceptable and can be used to satisfy the data requirements for V-53482:

161-1 Hydrolysis (MRID#'s 42697501 and 42684905)
163-1 Mobility and Column Leaching of Unaged S-53482 (MRID#'s 42684907 and 42684908)

Inform the registrant that the following studies are acceptable and partially satisfy the data requirements for V-53482:

162-1 Aerobic Soil Metabolism (MRID# 42684906)
163-1 Mobility and Column Leaching of Aged S-53482 (MRID# 42684909)

To fully satisfy the above mentioned data requirements for this chemical, the registrant should submit new studies using radiolabeled [^{14}C-THP]-V-53482.

Inform the registrant that EFGWB concurs with the requested waiver of the Bioaccumulation in Fish data requirement for V-53482.

9. BACKGROUND:

S-53482 or V-53482 is a herbicide; the registrant claims it is active and selective for broadleaved weeds by preemergent and preplant application on soybeans. It is manufactured by Valent U.S.A. Corporation. There are two formulations: V-53482 WP Herbicide is a wettable powder and V-53482 WDG Herbicide is a water dispersible granule. Both formulations have the same composition (about 50% active ingredient). The product is packed in water-soluble packages designed to reduce exposure to workers, since acute human exposure is of concern with this product. The proposed use rates range form 21.3 to 42.5 g ai/A (0.047-0.094 lb ai/A).

EFGWB received a data package containing an EUP application to perform a mixer/loader and applicator exposure study only. The registrant also submitted studies to satisfy the Hydrolysis, Aerobic Soil Metabolism, and Mobility data requirements. In addition, the registrant requested a waiver of the Bioaccumulation in Fish data requirement.

10. DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

Refer to DER's for details.

11. COMPLETION OF ONE-LINER:

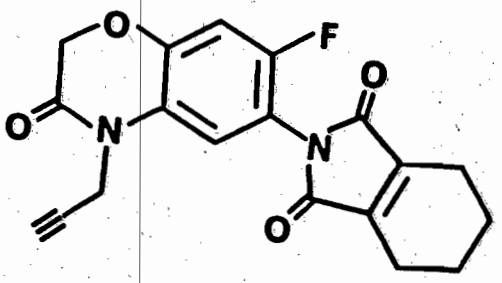
EFGWB updated the One-Liner data base for V-53482 with this report.

12. CBI APPENDIX:

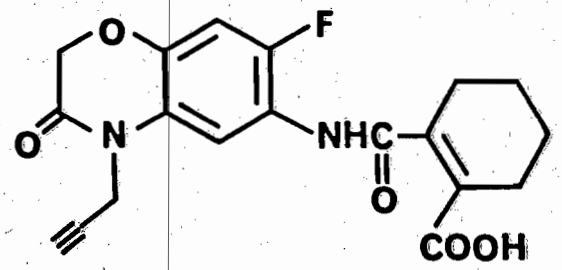
The registrant considers all data reviewed here as "company confidential" and must be treated as such.

rev60
jlm

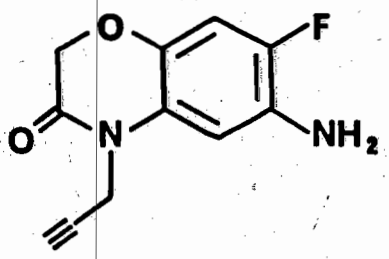
S-53482 and its degradates



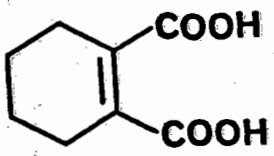
S-53482
7-Fluoro-6-[(3,4,5,6-tetrahydro)phthalimido]-4-
(2-propynyl)-1,4-benzoxazin-3(2H)-one



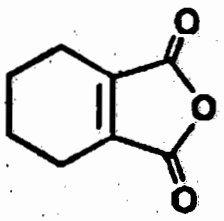
482-HA
7-Fluoro-6-[(2-carboxy-1-cyclohexenoyl)amino]-
4-(2-propynyl)-1,4-benzoxazin-3(2H)-one



APF
6-Amino-7-fluoro-4-(2-propynyl)-1,4-benzoxazin-3(2H)-one



THPA
3,4,5,6-tetrahydrophthalic acid



$^{1}\Delta$-TPA
3,4,5,6-Tetrahydrophthalic acid anhydride

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Environmental Fate & Effects Division
PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY
V-53482
Last Update on June 21, 1993
[V] = Validated Study [S] = Supplemental Study [U] = USDA Data

LOGOUT	Reviewer: JJM	Section Head:	Date: 6/21/93

Common Name:V-53482
Smiles Code:
PC Code # :129034 CAS #:103361-09-7 Caswell #:

Chem. Name :7-fluoro-6[(3,4,5,6-tetrahydro)phthalimide]-
4-(2-propynyl)-1,4-benzoxazine-3(2H)-one
Action Type:Herbicide

Trade Names:V-53482 WP Herbicide, V-53482 WDG Herbicide
(Formul'tn):Wettable powder and Wettable dispersible granule
Physical State: solid

Use :Terrestrial Non-Food, Terrestrial Food
Patterns :
(% Usage) :
:

Empirical Form:
Molecular Wgt.: Vapor Pressure: 2.41E -6 Torr
Melting Point : 202-204 °C Boiling Point: °C
Log Kow : 2.55 pKa: @ °C
Henry's : E Atm. M3/Mol (Measured)

Solubility in ...					Comments
Water	1.79	E	ppm	@25.0 °C	
Acetone		E	ppm	@ °C	1.70 g/mL
Acetonitrile		E	ppm	@ °C	3.23 g/mL
Benzene		E	ppm	@ °C	
Chloroform		E	ppm	@ °C	
Ethanol		E	ppm	@ °C	
Methanol		E	ppm	@ °C	0.156 g/mL
Toluene		E	ppm	@ °C	
Xylene		E	ppm	@ °C	
Hexane		E	ppm	@ °C	0.00247 g/mL
n-octanol		E	ppm	@ °C	0.0163 g/mL

Hydrolysis (161-1)
[V] pH 5.0:3.4-5.1 days
[V] pH 7.0:21.4-24.6 hours
[V] pH 9.0:14.6-22.0 min.
[ ] pH :Major hydrolysates: 482-HA, APF, THPA, and 1-delta-TPA
[ ] pH :
[ ] pH :

Environmental Fate & Effects Division
PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY
V-53482
Last Update on June 21, 1993
[V] = Validated Study [S] = Supplemental Study [U] = USDA Data

Photolysis (161-2, -3, -4)
[ ] Water:
[ ] :
[ ] :
[ ] :

[ ] Soil :
[ ] Air :

Aerobic Soil Metabolism (162-1)
[S] t1/2=11.9 days. V-53482 residues bound to the soil. No major
[ ] degradates detected. CO2 was only 11.5% after 181 days.
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Anaerobic Soil Metabolism (162-2)
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Anaerobic Aquatic Metabolism (162-3)
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Aerobic Aquatic Metabolism (162-4)
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Environmental Fate & Effects Division
PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY
V-53482
Last Update on June 21, 1993
[V] = Validated Study [S] = Supplemental Study [U] = USDA Data

Soil Partition Coefficient (Kd) (163-1)
[ ]
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[ ]

Soil Rf Factors (163-1)

	soil type	Rf	Kd	Koc
[V]	sand	0.59-0.61	0.465-0.484	265-277
[V]	sandy loam	0.56-0.57	0.744-0.833	105-118
[V]	silt loam	0.15-0.30	4.37-11.0	675-1705
[V]	clay loam	0.08-0.11	14.6-24.0	497-816

[S] Aged study [Ph]V-53482, residues remain mainly in the soils.

Laboratory Volatility (163-2)
[ ]
[ ]

Field Volatility (163-3)
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Terrestrial Field Dissipation (164-1)
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Aquatic Dissipation (164-2)
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Forestry Dissipation (164-3)
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Long-Term Soil Dissipation (164-5)
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Accumulation in Rotational Crops, Confined (165-1)
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Accumulation in Rotational Crops, Field (165-2)
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Accumulation in Irrigated Crops (165-3)
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Bioaccumulation in Fish (165-4)
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Bioaccumulation in Non-Target Organisms (165-5)
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Ground Water Monitoring, Prospective (166-1)
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Ground Water Monitoring, Small Scale Retrospective (166-2)
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Degradation Products

Hydrolysates:
7-fluoro-6-[(2-carboxy-cyclohexenoyl)amino]-4-(2-propynyl)-
1,4-benzoxazin-3(2H)-one (482-HA)
6-Amino-7-fluoro-4-(2-propynyl)-1,4-benzoxazin-3(2H)-one (APF)
3,4,5,6-tetrahydrophthalic acid (THPA)
3,4,5,6-tetrahydrophthalic acid anhydride (1-delta-TPA)

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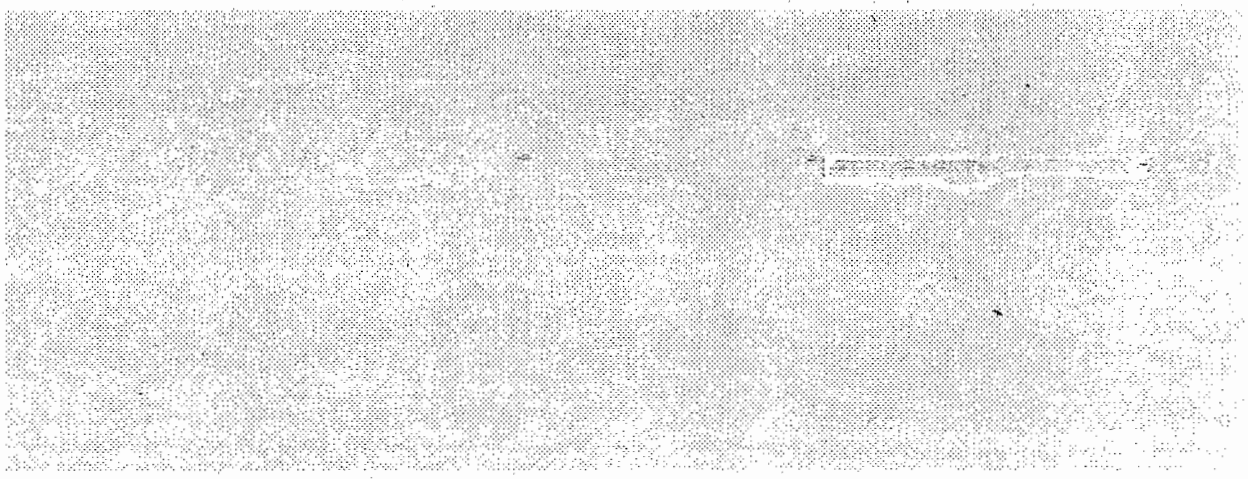
Comments



References: EFGWB# 93-0573
Writer : JLM