Data Evaluation Report on the terrestrial field dissipation of GF-1442

PMRA Submission 2006-4728; EPA MRID Number 46908334; APVMA ATS 40362

Data Requirement: PMRA Data Code: 8.3.2
EPA DP Code: 332118
OECD Data Point: IIA 7.3, IIA 7.3.1, IIA 7.3.2, IIA 7.3.3, IIIA 9.2.1, IIIA 9.2.2, IIIA 9.2.3
US EPA Guideline: Subdivision N, Section 164-1
Canada PMRA Guideline: Trade Memorandum T1-255

Test Material: GF-1442
End Use Product name: GF-1442
Concentration of a.i.: XDE-742: 4.7% (wt/wt)

Formulation type: oil dispersion (OD)
Active ingredient:
Common name: XDE-742
Chemical name:
IUPAC: N-(5,7-dimethoxy[1,2,4]triazolo[1,5-α]pyrimidin-2-yl)-2-methoxy-4-(trifluoromethyl)-3-pyridinesulfonamide
CAS name: N-(5,7-dimethoxy[1,2,4]triazolo[1,5-α]pyrimidin-2-yl)-2-methoxy-4-(trifluoromethyl) -3-pyridinesulfonamide
CAS No: 422556-08-9
Synonyms: TSN102482 (Analytical Standard)
SMILES string: c1(c(ccnc1OC)C(F)(F)F)S(Nc2nn3c(n2)nc(cc3OC)OC)(=O)=O

Primary Reviewer: Amber McCoy (PMRA) 5 March 2007

Secondary Reviewer: Catherine Evans (PMRA) 5 March 2007

Greg Orrick (USEPA) 31 May 2007
DBell for Greg Orrick October 25, 2007

David McAdam (AUS DEW) 4 June 2007
D. Murphy for David McAdam November 2, 2007

Émilie Larivière (PMRA) 19 October 2007
Émilie Larivière 19 October 2007

Company Code: DWE
Active Code: JUA
Use Site Category: 13, 14
EPA PC Code: 108702

CITATION: Roberts, D.; Coukell, G.; Schelle, G.; McLean, N. 2006, Terrestrial Field Dissipation of XDE-742 Herbicide and Cloquintocet Safener in Canada. Dow AgroSciences, Regulatory Laboratories - Indianapolis Lab. Study ID 040037. Culy, M. August 2006. PMRA# 1283372.

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EXECUTIVE SUMMARY:

Field dissipation of GF-1442 under Canadian prairie field conditions was conducted in bare ground plots at 4 sites: Alberta (AB) (Ecoregion 9.1/9.2 ; sandy clay loam); Saskatchewan 1 (SK1) (Ecoregion 9.1/9.2 , clay); Saskatchewan 1 (SK2) (Ecoregion 9.3, loam); and Manitoba (MB) (Ecoregion 9.2, clay loam). Sites SK2 and MB are found in Ecoregions relevant to use sites in the US. The experiment was carried out in accordance with Canada PMRA guideline T1-255, US EPA guideline Subdivision N, Section 164-1, and in compliance with the OECD-GLP standard.

The end-use product, GF-1442, was surface broadcast sprayed to achieve an XDE-742 (a.i.) application rate of 25 g a.i./ha in three replicate 32 m X 6 m plots at each site. Randomly placed application monitors (15 24-cm diameter filter paper circles per site) found that rates were 25.6, 25.6, 24.8 and 25.3 g a.i./ha in AB, SK1, SK2 and MB respectively. Field spiking was not conducted. All sites were irrigated (May-Sept) to a target of 110% of the 30 year precipitation normal. For the duration of the studies, total precipitation was 99%, 136%, 111% and 121% of normal for AB, SK1, SK2 and MB, respectively.

Soil samples were collected at: 0, 5, 7, 15, 22, 29, 68, 91, 120, 370, 403, 433 and 462 days post-application in AB; 0, 7, 14, 20, 35, 59, 93, 136 and 370 days in SK1; 0, 3, 7, 14, 21, 28, 64, 94, 125 and 359 days in SK2; and 0, 3, 8, 15, 21, 28, 62, 92 and 126 days in MB. Samples were taken to a depth of 90 cm, segmented into 15 cm sections and combined to produce 3 composite samples per 15 cm segment. Samples were analyzed for XDE-742 and the transformation products 7-OH-XDE-742, 5-OH-XDE-742 and 6-Cl-7-OH-XDE-742

At AB, the initial concentration was 12.8 g a.i./ha. XDE-742 dissipated steadily and rapidly from the maximum concentration. On day 370 the concentration was 1.3 g a.i./ha and at study termination the concentration was 0.8 g a.i./ha. The residues of XDE-742 were primarily detected in the top 30-cm soil profile. The major transformation products detected at AB were 7-OH-XDE-742 and 6-Cl-7-OH-XDE-742. The 7-OH-XDE-742 maximum concentration was 5.3 g a.i./ha (parent equivalents) or 41% of initial parent, observed at 68-DAT in the upper 30-cm soil profile. However, there were detections in the 30-45 cm and 45-60 cm depths on day 5 for which there was no discussion by the study author. At the end of the study, 7-OH-XDE-742 was 1.5 g a.i./kg (parent equivalent) or 12% of the initial parent. The residues of 7-OH-XDE-742 were primarily detected in the top 15-cm soil profile. The 6-Cl-7-OH-XDE-742 maximum concentration was 0.8 to 0.9 g a.i./kg or 6 to 7% of initial parent, observed at 68-DAT through 462-DAT, primarily observed in the top 15-cm soil profile.

At SK1, the initial concentration was 25.9 g a.i./ha. XDE-742 dissipated steadily and rapidly from the maximum concentration. On day 35 the parent was last detected at a concentration of 0.3 g a.i./ha and at study termination the concentration was 0 g a.i./ha. The residues of XDE-742 were primarily detected in the top 30-cm soil profile. The major transformation products detected at SK1 were 5-OH-XDE-742, 7-OH-XDE-742 and 6-Cl-7-OH-XDE-742. The 5-OH-XDE-742 maximum concentration and only day of detection was 0.5 g a.i./ha (parent equivalents) or 2% of initial parent, observed at 7-DAT in the upper 15-cm soil profile. The 7- OH-XDE-742 maximum concentration was 2.1 g a.i./ha (parent equivalents) or 8% of initial parent, observed at 7-DAT in the upper 15-cm soil profile. The last detection of 7-OH-XDE-742 was 0.3 g a.i./kg (parent equivalent) or 1% of the initial parent on day 35. The residues of 7-OH-XDE-742 were primarily detected in the top 15-cm soil profile. The 6-Cl-7-OH-XDE-742 only concentration measured was 0.2 g a.i./kg or 1% of initial parent, observed on days 14, 35 and 370 in the top 15-cm soil profile.

At SK2, the initial concentration was 21.7 g a.i./ha. XDE-742 dissipated steadily and rapidly from the maximum concentration. On day 28 the parent was last detected at a concentration 0.2 g a.i./ha. The residues of XDE-742 were primarily detected in the top 15-cm soil profile. The major transformation products detected at SK2 were 7-OH-XDE-742 and 6-Cl-7-OH-XDE-742. The 7-OH-XDE-742 maximum concentration was 0.8 g a.i./ha (parent equivalents) or 4% of initial parent, observed on day 14 in the upper 15-cm soil profile. The last detection of 7-OH-XDE-742 was on day 21 at 0.4 g a.i./kg (parent equivalent) or 2% of the initial parent. The residues of 7-OH-XDE-742 were primarily detected in the top 15-cm soil profile. The 6-Cl-7-OH-XDE-742 maximum concentration was 0.7 g a.i./kg or 3% of initial parent, observed on day 14. The last detection was on day 28 at 0.1 g a.i./ha or 0.5% of the initial parent. All detections were primarily observed in the top 15-cm soil profile.

At MB, the initial concentration was 16.6 g a.i./ha and then rose to 17.0 g a.i./ha on day 3. XDE-742 dissipated steadily and rapidly from the maximum concentration. At study termination (126 DAT), the parent was detected at a concentration of 0.7 g a.i./ha. The residues of XDE-742 were detected primarily in the 30-cm soil profile, however, on day 15 there were detections in each section down to a depth of 60 cm. The major transformation products detected at MB were 7-OH-XDE-742 and 6-Cl-7-OH-XDE-742. The 7-OH-XDE-742 maximum concentration was 1.3 g a.i./ha (parent equivalents) or 8% of initial parent, observed on day 28 in the upper 30-cm soil profile. The last detection of 7-OH-XDE-742 was on day 62 at 0.4 g a.i./kg (parent equivalent) or 2% of the initial parent. The residues of 7-OH-XDE-742 were primarily detected in the top 30-cm soil profile. The transformation product 6-Cl-7-OH-XDE-742 was not detected at the MB site.

Under field conditions, XDE-742 was found to have a DT50 ranging from 5 - 29 days and a DT90 ranging from 15 - 239 days, calculated using simple first order kinetics for all sites excluding Alberta, for which double first order in parallel models were used. The major transformation product 7-OH-XDE-742 was found to have a DT50 ranging from 3 - 97 days and a DT90 10-321 days. A DT50 could only be calculated for 6-Cl-7-OH-XDE-742 in the AB site at 84 days and the DT90 was found to be 279 days.

The maximum carry-over to the next growing season occurred at the AB site with 10% of the parent still present the following spring.

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Results Synopsis:

For PMRA, the field half-life or 50% dissipation time (DT_{50}) and DT_{90} of parent XDE-742 (a.i.) in soil under terrestrial field conditions using LC/MS/MS (1) was:

SITE	AB	SK1	SK2	MB
XDE-742				
DT50	29 d	5 d	5 d	13 d
DT90	239 d	15 d	15 d	44 d
7-OH-XDE-742				
DT50	97 d	3 d	6 d	21 d
DT90	321 d	10 d	21 d	70 d
6-Cl-7-OH-XDE-742				
DT50	84 d	--	--	--
DT90	279 d	--	--	--

Study Acceptability: The PMRA and DEW classify this study as acceptable. The PMRA and DEW agree with the US EPA regarding the concern over the storage stability study (study too short), however, a new study is not expected to produce significantly different results.

For USEPA, the field dissipation half-lives and dissipation times of parent XDE-742 were:

Site	Half-life (non-linear)	DT_{50}	DT_{90}
AB	31 days	~29 days	370-403 days
SK1	5 days	<7 days	14 days
SK2	5 days	3-7 days	14-21 days
MB	23 days	<20 days	<93 days

Study Acceptability: The USEPA classifies this study as supplemental because samples were stored as long as 588 days. An ongoing storage stability study of XDE-742 and its transformation products has only confirmed stability for XDE-742, 5-OH-XDE-742, and 6-Cl-7-OH-XDE-742 in frozen soil samples for six months (MRID 46908317). 7-OH-XDE-742 displayed reduced recovery over six months in a loam soil. Pending results from the completed storage stability study, the dissipation kinetics of this study are uncertain.

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED:	Canada PMRA Trade Memorandum T1-255; U.S. EPA Subdivision N, Sec. 164-1. No deviations from guidelines.

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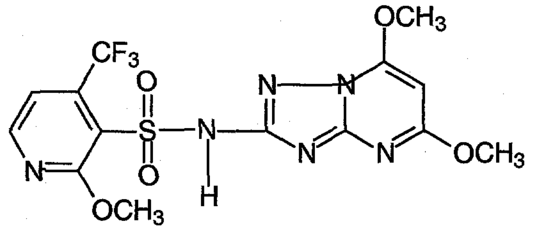
PMRA Submission 2006-4728; EPA MRID Number 46908334; APVMA ATS 40362

COMPLIANCE: U.S. EPA GLPS and OECD-GLP; signed and dated GLP, Quality Assurance, and Data Confidentiality statements were provided.

A. MATERIALS:

1. Test Material GF-1442

Chemical structure of the active ingredient:



XDE-742 (a.i.)

Description:

oil dispersible (OD)

Storage conditions of test chemicals: Test material (GF-1442) was stored under normal ambient conditions and mixed light/dark illumination.

Physico-chemical Properties of XDE-742:

Parameter	Values	Comments
Water solubility (20 °C) pH 4 pH 7 pH 9	 16.4 mg/L 3.20×10^3 mg/L 1.37×10^4 mg/L	Strong pH influence on solubility
Vapour pressure/volatility (20 °C)	$<8 \times 10^{-10}$ torr 1.07 Pa	
UV absorption "Neutral" aqueous solution (2< pH< 12)	λmax = 297 nm ε = 8000 L/(mol*cm)	
pKa (20 °C)	4.67	

log Kow pH 4 pH 7 pH 9	 1.08 -1.01 -1.60	Trend consistent with solubility results
Stability of compound at room temperature, if provided	N/A	

2. Test site: Description of the location and pesticide use history at each test site.

Table 1: Geographic Location, Site Description and Climatic Data at the Study Sites.

Details		AB Site	SK1 Site	SK2 Site	MB Site
Geographic coordinates	Latitude	53° 75.45'N	52° 16.57'N	51° 49.42'N	49° 57.83'N
	Longitude	113° 19.25'W	106° 18.82'W	106° 26.25'W	98° 16.06'W
	Province	Alberta	Saskatchewan	Saskatchewan	Manitoba
	Country	Canada	Canada	Canada	Canada
	Ecoregion	9.1/9.2 Boreal Plain/Temperate Prairie	9.1/9.2 Boreal Plain/Temperate Prairie	9.3 West-Central semi-arid Prairies	9.2 Temperate Prairies
Slope gradient		<2%	<2%	<2%	≤1%
Depth to groundwater (m)		ca. 97 m	ca. 13.7 m	ca. 13.7 m	ca. 3 m
Distance from weather station used for climatic measurements		Precipitation: 5 m 5 km (Jul-04) Air temp.: 8 km	Precipitation: 5 m 5 km (Jul-04) Air temp.: 20 km	Precipitation: 5 m 7 km (Jul-04) Air temp.: 40 km	Precipitation: 5 m Air temp.: 5 km
Indicate whether the meteorological conditions before starting or during the study were within 30 year normal levels (Yes/No). If no, provide details.		No Jun., Aug-Nov. 2004: very dry Jul., Dec. 2004: 2X normal precip. Overall: 99% of normal precip.	No Sep. 2004: dry Oct. 2004: 3X normal precip. Nov. 2004: dry May, Jun. 2005: dry Aug. 2005: 3X normal precip. Overall: 136% of normal precip.	No Sep., Nov. 2004: very dry Mar. 2005: 2X normal precip. Overall: 111% of normal precip.	No Sep., Nov. 2004: dry Feb.-Apr. 2005: dry Jul. 2005: 2X normal precip. Overall: 99% of normal precip.
Other details, if any		None	None	None	None

Table 2: Site Usage and Management History for the Previous Three Years

Use	Year	AB Site	SK1 Site	SK2 Site	MB Site
Crops grown	Previous year	Potato	Wheat	Canola	Barley
	2 years previous	Barley	Wheat	Wheat	Barley
	3 years previous	Wheat	Wheat	Alfalfa	Fallow
Pesticides used	Previous year	Metribuzin Rimsulfuron Diquat	Lambda-cyhalothrin Bromoxynil MCPA ester	Glyphosate	Fenoxaprop-p-ethyl Bromoxynil MCPA ester

	2 years previous	Tralkoxydim Bromoxynil MCPA ester	Dicamba 2,4-D amine Mecoprop	Clodinafop-propargyl Thifen-sulfuron methyl	Thifen-sulfuron methyl Tribenuron methyl propanil
	3 years previous	Clodinafop-propargyl Thifensulfuron methyl	n/d	n/d	Glyphosate
Fertilizers used	Previous year	n/d	n/d	n/d	n/d
	2 years previous	n/d	n/d	n/d	n/d
	3 years previous	n/d	n/d	n/d	n/d
Cultivation methods, if provided	Previous year	n/d	n/d	n/d	n/d
	2 years previous	n/d	n/d	n/d	n/d
	3 years previous	n/d	n/d	n/d	n/d

n/d – no data available

Table 3: Properties of the Soil from AB Site.

Depth	Bulk Density[c]	Organic Matter	Soil pH	CEC[a]	Water Content at		Particle Distribution			Texture Class[b]
					1/3 Bar	15 Bar	Sand	Silt	Clay	
(cm)	(g/cm^3)	(%)		(meq/100g)	(%)	(%)	(%)	(%)	(%)	
0-15	0.87	6.1	5.8	20.1	21.5	14.1	55	22	23	SCL
15-30	1.07	3.6	6.3	18.7	17.8	10.9	49	30	21	L
30-45	1.10	0.9	7.6	17.0	15.0	9.1	57	20	23	SCL
45-60	1.08	0.6	8.0	14.8	13.2	8.3	63	18	19	SL
60-75	1.05	0.7	8.0	14.7	14.1	8.7	63	16	21	SCL
75-90	1.06	0.7	7.9	16.5	15.7	10.2	57	19	24	SCL

Taxonomic classification:

Canadian: chernozemic order, Black great group, Eluviated Black subgroup

US: Udic Boroll subgroups

a Cation exchange capacity
b Per USDA. L: loam, S: sand, C: clay, Si: silt
c Undisturbed soil core

Table 4: Properties of the Soil from SK1 Site.

Depth	Bulk Density[c]	Organic Matter	Soil pH	CEC[a]	Water Content at		Particle Distribution			Texture Class[b]
					1/3 Bar	15 Bar	Sand	Silt	Clay	
(cm)	(g/cm^3)	(%)		(meq/100g)	(%)	(%)	(%)	(%)	(%)	
0-15	1.07	3.5	8.0	30.9	33.3	21.9	23	27	50	C
15-30	0.97	2.2	8.2	33.3	32.8	21.8	23	25	52	C
30-45	0.91	1.9	8.4	29.2	30.8	21.4	23	27	50	C
45-60	0.94	1.6	8.4	32.2	30.9	21.1	25	27	48	C
60-75	0.98	1.4	8.2	37.4	29.9	20.1	26	24	50	C
75-90	1.02	0.9	8.2	61.6	30.1	19.7	27	19	54	C

Taxonomic classification:

Canadian: chernozemic order, Dark Brown great group, Orthic Dark Brown subgroup

US: Typic Boroll subgroups

a Cation exchange capacity
b Per USDA. L: loam, S: sand, C: clay, Si: silt
c Undisturbed soil core

Table 5: Properties of the Soil from SK2 Site.

Depth	Bulk Density[c]	Organic Matter	Soil pH	CEC[a]	Water Content at		Particle Distribution			Texture Class[b]
					1/3 Bar	15 Bar	Sand	Silt	Clay	
(cm)	(g/cm^3)	(%)		(meq/100g)	(%)	(%)	(%)	(%)	(%)	
0-15	1.01	3.8	7.2	18.8	23.1	12.4	42	38	20	L
15-30	1.02	1.7	6.9	18.7	20.2	10.9	44	33	23	L
30-45	1.02	1.5	8.1	17.1	21.9	11.6	26	50	24	L
45-60	1.08	1.1	8.6	16.1	21.9	11.4	30	46	24	L
60-75	1.32	0.9	8.7	17.3	20.7	10.7	34	40	26	L
75-90	1.35	0.9	8.8	15.9	17.6	8.6	50	24	26	SCL

Taxonomic classification:

Canadian: chernozemic order, Dark Brown great group, Orthic Dark Brown Black subgroup

US: Typic Boroll subgroups

a Cation exchange capacity
b Per USDA. L: loam, S: sand, C: clay, Si: silt
c Undisturbed soil core

Table 6: Properties of the Soil from MB Site.

Depth	Bulk Density[c]	Organic Matter	Soil pH	CEC[a]	Water Content at		Particle Distribution			Texture Class[b]
					1/3 Bar	15 Bar	Sand	Silt	Clay	
(cm)	(g/cm^3)	(%)		(meq/100g)	(%)	(%)	(%)	(%)	(%)	
0-15	0.96	8.0	7.7	36.5	41.7	28.2	26	42	32	CL
15-30	0.79	6.6	8.0	31.2	41.9	28.4	24	48	28	CL
30-45	0.80	5.1	8.3	32.9	41.7	27.7	22	47	31	CL
45-60	0.89	3.2	8.5	29.0	36.1	26.7	22	42	36	CL
60-75	0.96	1.5	8.6	22.1	32.9	21.9	25	41	34	CL
75-90	--	0.8	8.6	19.7	26.5	12.6	26	50	24	L

Taxonomic classification:

Canadian: chernozemic order, Black great group, Gleyed Carbonated Rego Black subgroup

US: Udic Boroll subgroups

a Cation exchange capacity
b Per USDA. L: loam, S: sand, C: clay, Si: silt
c Undisturbed soil core

B. EXPERIMENTAL DESIGN:

1. Experimental design:

Table 7: Experimental Design.

Details		AB Site	SK1 Site	SK2 Site	MB Site
Duration of study		462 days	370 days	359 days	126 days
Uncropped (bare) or cropped		Bare	Bare	Bare	Bare
Control used (Yes/No)		Yes	Yes	Yes	Yes
No. of replications	Controls	1	1	1	1
	Treatments	3	3	3	3
Plot size (L x W m)	Control	8 x 6 m	8 x 6 m	8 x 6 m	8 x 6 m
	Treatment	(32 x 6 m) x 3	(32 x 6 m) x 3	(32 x 6 m) x 3	(32 x 6 m) x 3
Distance between control plot and treated plot		> 15 m	> 15 m	> 15 m	> 15 m
Distance between treated plots		2 m	2 m	2 m	2 m
Application rate(s) used (g a.i/ha)		25.6 g a.i./ha	25.6 g a.i./ha	25.6 g a.i./ha	25.6 g a.i./ha
Was the maximum label rate per ha used in study? (Yes/No)		Yes	Yes	Yes	Yes
Number of applications		1	1	1	1
Application Date(s) (dd mm yyyy)		27 May 2004	8 June 2004	22 June 2004	29 June 2004
For multiple applications, application rate at Day 0 and at each application time (mg a.i./kg soil)		n/a	n/a	n/a	n/a
Application method (e.g., spraying, broadcast etc.)		Ground broadcast	Ground broadcast	Ground broadcast	Ground broadcast
Type of spray equipment, if used		Tractor boom	Tractor boom	Tractor boom	Tractor boom
Total volume of spray solution applied/plot **OR** total amount broadcasted/plot		288.09 L/ha	287.02 L/ha	278.02 L/ha	286.62 L/ha
Identification and volume of carrier (e.g., water), if used		Water 24.9 L	Water 24.8 L	Water 24.8 L	Water 27.0 L
Name and concentration of co-solvents, adjuvants and/or surfactants, if used		Assist adjuvant 0.8% (v/v)	Assist adjuvant 0.8% (v/v)	Assist adjuvant 0.8% (v/v)	Assist adjuvant 0.8% (v/v)

Details		AB Site	SK1 Site	SK2 Site	MB Site
Indicate whether the following monthly reports were submitted: Average minimum and maximum precipitation Average minimum and maximum air temperature Average minimum and maximum soil temperature Average annual frost-free periods		Total precipitation (including snow and irrigation) min., max and ave. air temperature No soil temperature	Total precipitation (including snow and irrigation) min., max and ave. air temperature soil temperature (10 cm)	Total precipitation (including snow and irrigation) min., max and ave. air temperature soil temperature (10 cm)	Total precipitation (including snow and irrigation) min., max and ave. air temperature No soil temperature
Indicate whether the Pan evaporation data were submitted		No	No	No	No
Meteorological conditions during application	Cloud cover	No	No	No	No
	Temperature (°C)	16°C	13.5°C	12.8°C	22°C
	Humidity	36%	48%	77%	35%
	Sunlight (hr)	No	No	No	No
Pesticides used during study: name of product/a.i concentration: amount applied: application method:		Reglone or glyphosate, 5 applications, ground broadcast	Glyphosate, 4 applications, ground broadcast	Reglone or glyphosate, 4 applications, ground broadcast	Glyphosate, 3 applications, ground broadcast
Supplemental irrigation used (Yes/No) If yes, provide the following details: No. of irrigation: Interval between irrigation: Amount of water added each time: Method of irrigation:		Yes 5 2/month as needed ave. 14 mm semi-permanent (hand-line sprinkler)	Yes 10 2/month as needed ave. 10 mm semi-permanent (hand-line sprinkler)	Yes 4 2/month as needed ave. 15 mm semi-permanent (hand-line sprinkler)	Yes 8 2/month as needed ave. 12 mm semi-permanent (hand-line sprinkler)
Indicate whether water received through rainfall + irrigation equals the 30 year average rainfall (Yes/No)		Yes (99%)	Yes (136%)	Yes (111%)	Yes (121%)
Were the application concentrations verified? (Briefly describe in Section 2)		Yes	Yes	Yes	Yes
Were field spikes used? (Briefly describe in Section 3)		No	No	No	No
Good agricultural practices followed (Yes or No)		Yes	Yes	Yes	Yes

Details	AB Site	SK1 Site	SK2 Site	MB Site
Indicate if any abnormal climatic events occurred during the study (e.g., drought, heavy rainfall, flooding, storm etc.)	Jun., Aug-Nov. 2004: very dry Jul., Dec. 2004: 2X normal precip. \	Sep. 2004: dry Oct. 2004: 3X normal precip. Nov. 2004: dry May, Jun. 2005: dry Aug. 2005: 3X normal precip.	Sep., Nov. 2004: very dry Mar. 2005: 2X normal precip.	Sep., Nov. 2004: dry Feb.-Apr. 2005: dry Jul. 2005: 2X normal precip.
If cropped plots are used, provide the following details: Plant - Common name/variety: Details of planting: Crop maintenance (e.g., fertilizers used):	n/a	n/a	n/a	n/a
Volatilization included in the study (Yes/No) (if included, describe in Section 4)	No	No	No	No
Leaching included in the study (Yes/No) (if included, describe in Section 5)	Yes	Yes	Yes	Yes
Run off included in the study (Yes/No) (if included, describe in Section 6)	No	No	No	No

2. Application Verification:
For each replicate plot, 5 randomly located 24-cm diameter filter paper disks were used.

3. Field Spiking (not applicable)

4. Volatilization (not applicable)

5. Leaching: Determined for each of three replicate plots by soil residue analysis of one composite sample (each comprised of five soil cores) per 15-cm layer (through 90 cm), per replicate plot.

6. Run-off (not applicable)

7. Supplementary Study: In a 2004 spray tank solution study (3), the test substance was mixed in a water-based spray solution (containing Assist* adjuvant at 1% v/v) at a range of solution concentrations (0.03-0.6 mg/mL XDE-742; 0.09-1.8 mg/mL cloquintocet mexyl) to encompass the concentration used in this study. At 4 and 24 hours after mixing, the test substance was determined to be stable and uniform throughout the spray tank solution.

Table 8. Sampling:

Details	AB Site	SK1 Site	SK2 Site	MB Site
Method of sampling (random or systematic)	Random	Random	Random	Random
Sampling intervals	0, 5, 7, 15, 22, 29, 68, 91, 120, 370, 403, 433, 462 days	0, 7, 14, 20, 35, 59, 93, 136, 370 days	0, 3, 7, 14, 21, 28, 64, 94, 125, 359 days	0, 3, 8, 15, 21, 28, 62, 92, 126 days
Method of soil collection (e.g., cores)	Cores	Cores	Cores	Cores
Sampling depth	90 cm	90 cm	90 cm	90 cm
Number of cores collected per plot	5	5	5	5
Number of segments per core	6	6	6	6
Length of soil segments	15 cm	15 cm	15 cm	15 cm
Core diameter (Provide details if more than one width)	0-15 cm: 5.5 cm 15-90 cm: 3.0 cm	0-15 cm: 5.5 cm 15-90 cm: 3.0 cm	0-15 cm: 5.5 cm 15-90 cm: 3.0 cm	0-15 cm: 5.5 cm 15-90 cm: 3.0 cm
Method of sample processing, if any	Like depth core segments were combined, producing one composite sample per replicate plot. Ground and mixed frozen.	Like depth core segments were combined, producing one composite sample per replicate plot. Ground and mixed frozen.	Like depth core segments were combined, producing one composite sample per replicate plot. Ground and mixed frozen.	Like depth core segments were combined, producing one composite sample per replicate plot. Ground and mixed frozen.
Storage conditions	Freezer within 15 min. of sampling	Freezer within 15 min. of sampling	Freezer within 15 min. of sampling	Freezer within 15 min. of sampling
Maximum storage length (days)	XDE-742: 588 days CQC[1]: 416 days	XDE-742: 588 days CQC[1]: 416 days	XDE-742: 588 days CQC[1]: 416 days	XDE-742: 588 days CQC[1]: 416 days

[1] CQC means cloquintocet-mexyl.

8. Analytical Procedures: Soil samples were analyzed for XDE-742 and its metabolites by a validated method (GRM 05.05) using liquid chromatography with tandem mass spectrometry (LC/MS/MS) (1).

Number of soil samples analyzed per treatment or composite sample: 155 samples total (per analyte, per test site)

Number of plant samples analyzed per treatment or composite sample: not applicable

Extraction, clean up and concentration of soil samples:

Residues of XDE-742 and its metabolites were extracted from the soil by sonicating with 1 N hydrochloric acid and shaking after the addition of methanol to produce a methanol/1N hydrochloric acid solution (90:10). A mixed XDE-742 and metabolite stable isotope internal standard solution was added to the extraction solvent and an aliquot of the extract was evaporated to dryness. The sample was reconstituted in 0.1 N hydrochloric acid and purified using a polymeric 96-well solid phase extraction (SPE) plate. The SPE plate was washed with a water/methanol solution (75:25) and eluted with an acetonitrile/methanol solution (50:50). The eluate was evaporated to dryness and the residues were reconstituted in a water/methanol solution (90:10) containing 2 mM ammonium acetate. The purified extract was analyzed by high performance liquid chromatography with positive-ion electrospray (ESI) tandem mass spectrometry (LC/MS/MS).

Identification and quantification of parent and transformation compounds:

The samples were analyzed by liquid chromatography with tandem mass spectrometry (LC/MS/MS). Sample analysis was performed using a Phenomenex Synergi, 4 μ, Hydro RP column installed in an Spark Holland Symbiosis Pharma coupled to a MDS Sciex model API 4000 tandem mass spectrometer. During analysis the following MS/MS transitions were monitored:

Compound	Ion m/z		Time, ms	Collision Energy, V
	Q1	Q3		
XDE-742 Quant	435	195	75	35
XDE-742 IS	438	198	75	35
5-OH-XDE-742 Quant	421	181	75	31
5-OH-XDE-742 IS	425	185	75	31
7-OH-XDE-742 Quant	421	181	75	31
7-OH-XDE-742 IS	425	185	75	31

The efficiency of the analytical method was determined at the time of analysis of each set of samples by fortifying aliquots of the appropriate control matrix with analyte and analyzing according to the method. An unfortified control matrix, reagent blank, and control matrix fortified at the limit of detection (LOD) were included in each set as well. The LD recovery samples were analyzed only to demonstrate observable peaks at the LOD level. Therefore, the percent recovery of analyte was not calculated for these samples. Fortified recoveries were analyzed over a range of 0.001 to 0.1 μg/g.

Detection limits (LOD, LOQ) for the parent XDE-742 and transformation compounds in soil:
LOD: 0.0003 μg/g
LOQ: 0.001 μg/g

II. RESULTS AND DISCUSSION

1. APPLICATION MONITORS:
The average recoveries for parent XDE-742 (a.i.) in the field application monitors were 87.6% (AB), 79.7% (SK1), 77.6% (SK2) and 114% (MB) based on the field application calculations.

2. MASS ACCOUNTING: Because this study was conducted using non-radio-labelled material, calculation of total mass accounting with time was not possible.

3. PARENT XDE-742 (a.i.):

At AB, the maximum starting concentration of parent XDE-742 (a.i.) in soil core samples was observed on 0-DAT at 12.8 g a.i./ha, representing 50 % of theoretically applied 25.6 g a.i./ha, or 64% of the proposed maximum seasonal application rate of 20 g a.i./ha. The residues of XDE-742 were primarily detected in the top 30-cm soil profile. At the end of the 462-day study period, the total carryover of residues of XDE-742 (a.i.) was 6% of applied a.i..

At SK1, the maximum starting concentration of parent XDE-742 (a.i.) in soil core samples was observed on 0-DAT at 25.9 g a.i./ha, representing 101 % of theoretically applied 25.6 g a.i./ha, or 130% of the proposed maximum seasonal application rate of 20 g a.i./ha. The residues of XDE-742 were primarily detected in the top 30-cm soil profile. At the end of the 370-day study period, the total carryover of residues of XDE-742 was 0.0% of applied a.i..

At SK2, the maximum starting concentration of parent XDE-742 (a.i.) in soil core samples was observed on 0-DAT at 21.7 g a.i./ha, representing 88% of theoretically applied 24.8 g a.i./ha, or 109% of the proposed maximum seasonal application rate of 20 g a.i./ha. The residues of XDE742 were primarily detected in the top 15-cm soil profile. At the end of the 359-day study period, the total carryover of residues of XDE-742 (a.i.) was 0.0% of applied a.i..

At MB, the maximum starting concentration of parent XDE-742 (a.i.) in soil core samples was observed on 0-DAT at 16.6 g a.i./ha, representing 66% of theoretically applied 25.3 g a.i./ha, or 83% of the proposed maximum seasonal application rate of 20 g a.i./ha. The residues of XDE-742 were primarily detected in the top 30-cm soil profile, with isolated, trace detections (≤ LOQ) in one replicate plot at 30-60 cm on 15-DAT. At the end of the 126-day study period, the total carryover of residues of XDE-742 (a.i.) was 4% of applied a.i..

For PMRA, the field half-life or 50% dissipation time (DT_{50}) and DT_{90} of parent XDE-742 (a.i.) in soil under terrestrial field conditions using LC/MS/MS (1) was:

AB site:	XDE-742 (a.i.)	Half-life/DT_{50} = 29 days	DT_{90} = 239 days
SK1 site:	XDE-742 (a.i.)	Half-life/DT_{50} = 5 days	DT_{90} = 15 days
SK2 site:	XDE-742 (a.i.)	Half-life/DT_{50} = 5 days	DT_{90} = 15 days
MB site:	XDE-742 (a.i.)	Half-life/DT_{50} = 13 days	DT_{90} = 44 days

The values were calculated by reviewer using simple first-order kinetics, except for the AB site, for which a double first order in parallel model was used. The statistical output and a Figure showing the dissipation curve for the AB site is presented in Appendix 1.

For USEPA, the field dissipation half-lives and dissipation times of parent XDE-742 were:

Site	Half-life (non-linear)	DT_{50}	DT_{90}
AB	31 days	~29 days	370-403 days
SK1	5 days	<7 days	14 days
SK2	5 days	3-7 days	14-21 days
MB	23 days	<20 days	<93 days

Table 9. Concentration of XDE-742 products expressed as g/ha and transformation (percent of a.i. equivalent) at AB (Tables 13-15, p. 65-74) (Reviewer calculated).

Compound	**Soil depth (cm)**	**Sampling times (days)**												
		0	5	7	15	22	29	68	91	120	370	403	433	462
XDE-742[a]	0-15	12.8	12.6	10.3	8.7	7.2	6.3	2.9	2.2	1.7	1.3	0.9	0.8	0.8
	15-30		0.2 (2%)				0.2 (2%)				0.2 (2%)			
	% Initial	100%	98%	81%	68%	51%	49%	23%	17%	11%	10%	7%	6%	6%
7-OH-XDE[a]	0-15		1.1	1.5	2.8	3.5	2.1	5.2	3.9	3.1	3.0	2.4	2.0	1.4
	15-30							0.5 (4%)			0.6 (5%)			
	% Initial[b]	0%	9%	13%	22%	29%	34%	41%	31%	25%	23%	20%	16%	12%
6-Cl-7-OH-XDE[a]	0-15						0.3	0.8	0.8	0.7	1.0	0.9	0.8	0.8
	15-30													
	30-45		0.4 (3%)											
	45-60		0.5 (4%)											
	% Initial[b]						3%	6%	6%	5%	6%	7%	6%	6%

[a] For each depth, the mean of three replicates (n=3)

[b] As percent of initial parent concentration in upper 15 cm. Transformation products converted to parent equivalents.

Table 10. Concentration of XDE-742 products expressed as g/ha and transformation (percent of a.i. equivalent) at SK1 (Tables 16-19, p. 74-81).

Compound	**Soil depth (cm)**	**Sampling times (days)**								
		0	7	14	20	35	59	93	136	37
XDE-742 [a]	0-15	25.9	7.5	2.2	1.2	0.3				
	15-30		1.6 (6%)	0.3 (1%)						
	% Initial	100%	29%	8%	5%	1%				
5-OH-XDE [a]	0-15		0.5							
	% Initial [b]		2%							
7-OH-XDE [a]	0-15		2.1	1.1	0.5	0.3				
	15-30									
	% Initial [b]		8%	4%	2%	1%				
6-Cl-7-OH-XDE [a]	0-15			0.2		0.2				0.2
	% Initial [b]			1%		1%				1%

[a] For each depth, the mean of three replicates (n=3)

[b] As percent of initial parent concentration in upper 15 cm. Transformation products converted to parent equivalents.

Table 11. Concentration of XDE-742 products expressed as g/ha and transformation (percent of a.i. equivalent) at SK2 (Tables 20-22, p. 81-86).

Compound	**Soil depth (cm)**	**Sampling times (days)**									
		0	3	7	14	21	28	64	94	125	35
XDE-742 [a]	0-15	21.7	13.0	7.9	2.6	1.0	0.2				
	% Initial	100%	60%	36%	12%	5%	1%				
7-OH-XDE [a]	0-15			0.7	0.8	0.4					
	% Initial [b]			3%	4%	2%					
6-Cl-7-OH-XDE [a]	0-15				0.7	0.5	0.1				
	% Initial [b]				3%	2%	1%				

[a] For each depth, the mean of three replicates (n=3)

[b] As percent of initial parent concentration in upper 15 cm. Transformation products converted to parent equivalents.

Table 12. Concentration of XDE-742 products expressed as g/ha and transformation (percent of a.i. equivalent) at MB (Tables 23-25, p. 87-92).

Compound	**Soil depth (cm)**	**Sampling times (days)**								
		0*	3	8	15	21	28	62	92	126
XDE-742[a]	0-15	16.6	17.0	13.3	6.3	4.3	4.5	1.3	0.8	0.7
	15-30				0.5 (3%)	0.2 (1%)	0.2 (1%)			
	30-45				0.3 (2%)					
	45-60				0.2 (1%)					
	% Initial		100%	78%	37%	25%	26%	8%	5%	4%
7-OH-XDE[a]	0-15			0.2	1.0	1.0	1.3	0.4		
	15-30						0.2 (1%)			
	% Initial[b]			1%	6%	6%	8%	2%		

[a] For each depth, the mean of three replicates (n=3)

[b] As percent of initial parent concentration in upper 15 cm. Transformation products converted to parent equivalents.

4. TRANSFORMATION PRODUCTS OF XDE-742 (a.i.):

At AB, the major transformation products detected were 7-OH-XDE-742 and 6-Cl-7-OH-XDE-742. The 7-OH-XDE-742 maximum concentration was 45% of initial a.i. (parent XDE-742), observed at 68-DAT in the upper 30-cm soil profile. At the end of the study, 7-OH-XDE-742 was 12% of initial a.i.. The residues of 7-OH-XDE-742 were primarily detected in the top 15-cm soil profile. The 6-Cl-7-OH-XDE-742 maximum concentration was 6 to 7% of initial a.i., observed at 68-DAT through 462-DAT, primarily observed in the top 15-cm soil profile. At the end of the study, 6-Cl-7-OH-XDE-742 was 6% of initial a.i.. The residues of 6-Cl-7-OHXDE-742 were primarily detected in the top 15-cm soil profile. However, there were detections on day 5 in the 30-45 cm and the 45-60 cm samples at 1-2% of the initial a.i.

At SK1, the major transformation products detected were 7-OH-XDE-742, 6-Cl-7-OH-XDE-742, and 5-OH-XDE-742. The 7-OH-XDE-742 maximum concentration was 2% of initial a.i. (parent XDE-742), observed at 7-DAT in the upper 15-cm soil profile. At the end of the study, 7-OH-XDE742 was 0% of initial a.i.. The residues of 7-OH-XDE-742 were primarily detected in the top 15-cm soil profile. The 6-Cl-7-OH-XDE-742 maximum concentration was 1% of initial a.i., observed at 14, 35 and 370-DAT in the top 15-cm soil profile. At the end of the study, 6-Cl-7OH-XDE-742 was 0% of initial a.i. The residues of 6-Cl-7-OH-XDE-742 were primarily detected in the top 15-cm soil profile. The only detection of 5-OH-XDE-742 occurred at 7-DAT at 2% of the initial a.i. in the top 15-cm of the soil profile.

At SK2, the major transformation products detected were 7-OH-XDE-742 and 6-Cl-7-OH-XDE-742. The 7-OH-XDE-742 maximum concentration was 4% of initial a.i. (parent XDE-742), observed at 14-DAT in the upper 15-cm soil profile. At the end of the study, 7-OH-XDE-742 was at 0% of initial a.i.. The residues of 7-OH-XDE-742 were primarily detected in the top 15-cm soil profile. The 6-Cl-7-OH-XDE-742 maximum concentration was 3% of initial a.i., observed at 14-DAT in the top 15-cm soil profile. At the end of the study, 6-Cl-7-OH-XDE-742 was at 0% of initial a.i.. The residues of 6-Cl-7-OH-XDE-742 were primarily detected in the top 15-cm soil profile.

At MB, the major transformation product detected was 7-OH-XDE-742. The 6-Cl-7-OH-XDE742 degradate was not detected in any sample. The 7-OH-XDE-742 maximum concentration was 9% of initial a.i. (parent XDE-742), observed at 59-DAT in the upper 30-cm soil profile. At the end of the study, 7-OH-XDE-742 was at 0% of initial a.i.. The residues of 7-OH-XDE-742 were primarily detected in the top 30-cm soil profile.

For PMRA, the field half-life or 50% dissipation time (DT_{50}) and DT_{90} of 7-OH-XDE-742 (a.i.) in soil under terrestrial field conditions using LC/MS/MS (1) was:

AB site:	7-OH-XDE-742	Half-life/DT_{50} = 97 days	DT_{90} = 321 days
SK1 site:	7-OH-XDE-742	Half-life/DT_{50} = 3 days	DT_{90} = 10 days
SK2 site:	7-OH-XDE-742	Half-life/DT_{50} = 6 days	DT_{90} = 21 days

MB site: 7-OH-XDE-742 Half-life/DT_{50} = 21 days DT_{90} = 70 days

For PMRA, the field half-life or 50% dissipation time (DT_{50}) and DT_{90} of 6-Cl-7-OH-XDE-742 (a.i.) in soil under terrestrial field conditions using LC/MS/MS (1) was calculated for the AB site, but not for SK1 and SK2, where detections were isolated and/or trace-level (between LOQ and LOD). At MB, 6-Cl-7-OH-XDE-742 detections were not observed.

AB site: 6-Cl-7-OH-XDE-742 Half-life/DT_{50} = 84 days DT_{90} = 279 days

For USEPA, degradate first-order half-lives (log-linear) were as follows:

Site	7-OH-XDE-742	6-Cl-7-OH-XDE-742	5-OH-XDE-742
AB	334 days	Stable	n/a[1]
SK1	10 days	n/a	n/a
SK2	n/a	5 days	n/a
MB	n/a	n/a	n/a

[1] n/a means not available because the degradate either was not detected or did not exhibit a clear pattern of decline.

Table 13: Chemical Names and CAS Numbers for the Transformation Products of XDE-742.

Applicant's Code Name	**CAS Number**	**IUPAC Chemical Name(s)**	**Chemical Formula**	**Molecular Weight (g/mol)**	**SMILES String**
XDE-742	422556 - 08-9	N-(5,7-dimethoxy[1,2,4]triazolo[1,5-α]pyrimidin-2-yl)-2-methoxy-4-(trifluoromethyl)-3-pyridinesulfonamide	$C_{14}H_{13}F_3N_6O_5S$	434.4	c1(c(ccnc1OC)C(F)(F)F)S(Nc2nn3 c(n2)nc(cc3OC)OC)(=O)=O
5-OH-XDE-742[a]	99607-70-2	N-(5-hydroxy-7-methoxy[1,2,4]triazolo[1,5-α]pyrimidin-2-yl)-2-methoxy-4-(trifluoromethyl)-3-pyridinesulfonamide	$C_{13}H_{11}F_3N_6O_5S$	420.3	c1(c(ccnc1OC)C(F)(F)F)S(Nc2nn3 c(n2)nc(cc3OC)O)(=O)=O
7-OH-XDE-742	not available	N-(7-hydroxy-5-methoxy[1,2,4]triazolo[1,5-α]pyrimidin-2-yl)-2-methoxy-4-(trifluoromethyl)-3-pyridinesulfonamide	$C_{13}H_{11}F_3N_6O_5S$	420.3	c1(c(ccnc1OC)C(F)(F)F)S(Nc2nn3 c(n2)nc(cc3O)OC)(=O)=O
6-Cl-7-OH-XDE-742	not available	N-(6-chloro-7-hydroxy-5-methoxy[1,2,4]triazolo[1,5-α]pyrimidin-2-yl)-2-methoxy-4-(trifluoromethyl)pyridine-3-sulfonamide	$C_{13}H_{10}ClF_3N_6O_5S$	454.8	c1(c(ccnc1OC)C(F)(F)F)S(Nc2nn3 c(n2)nc(c(c3O)Cl)OC)(=O)=O

[a] The 5-OH-XDE-742 transformation product was observed at only one test site (SK1) on one sampling event (7-DAT) at the limit of analytical detection (0.0003 µg/g)

5. EXTRACTABLE AND NON-EXTRACTABLE RESIDUES: Non-extractable residues were not measured.

Table 14: Dissipation Routes of XDE-742 (a.i.) under Field Conditions.

Route of dissipation	**AB:** **% of applied amount (to the start of the next growing season (370 days))**	**SK1:** **% of applied amount (at the end of study period)**	**SK2:** **% of applied amount (at the end of study period)**	**MB:** **% of applied amount (at the end of study period)**
Accumulation (residues) in soil/ carry over	10%	0%	0%	4%
Transformation (% of transformation products)	29%	1%	0%	0%
Leaching, if measured	Upper 30 cm layer, with detections of the transformation product 6-Cl-7-OH-XDE to a depth of 60 cm.	Upper 30 cm layer	Upper 30 cm layer	Upper 30 cm layer, with detections of the parent down to 60 cm
Total	39%	1%	0%	4%

6. VOLATILIZATION: not determined.

7. PLANT UPTAKE: not determined.

8. LEACHING: At AB, XDE-742 (a.i.) and degradates were not detected below 30 cm at any sampling event except isolated, trace detections (<1% of applied XDE-742 a.i.) of 6-Cl-7-OH-XDE-742 in the 30-60-cm layer at 5-DAT. At SK1, detections of XDE-742 and degradates were limited to the upper 30-cm of the soil profile. At SK2, detections of XDE-742 and degradates were limited to the upper 15-cm of the soil profile. At MB, detections of XDE-742 and degradates were limited to the upper 30-cm of the soil profile, except for trace detections at 0.2 to 0.3 g/ha (1 to 2 % of initial XDE-742 a.i.) observed in one of three replicate composite samples at 30-60 cm on 15-DAT.

9. RUN OFF: not determined.

10. RESIDUE CARRYOVER:

At AB, the DT_{90} value for XDE-742 (a.i.) was 239 days. After 120 days, 11% of initial XDE-742 (a.i.) was detected with 10% detected at the beginning of the following growing season, 370-DAT. At the beginning of the next growing season (370-DAT), carryover of the transformation products, 7-OH-XDE-742 and 6CL-7-OH-XDE-742 was 23% and 3% of initial XDE-742 (a.i.), respectively.

At SK1, the DT_{90} value for XDE-742 (a.i.) was 15 days. After 136 days, 0% of initial XDE-742 (a.i.) was detected with no potential for carryover into the following growing season. At the end of the study (370-DAT), carryover of the transformation products, 7-OH-XDE-742 and 6-Cl-7OH-XDE-742 was 0% and 1% of initial XDE-742 (a.i.), respectively.

At SK2, the DT_{90} value for XDE-742 (a.i.) was 15 days. After 125 days, 0% of initial XDE-742 (a.i.) was detected with no potential of carryover into the following growing season. At the end of the study (359-DAT), carryover of the transformation products, 7-OH-XDE-742 and 6-Cl-7OH-XDE-742 was 0% and 0% of initial XDE-742 (a.i.), respectively.

At MB, the DT_{90} value for XDE-742 (a.i.) was 44 days. After 126 days, 4% of initial XDE-742 (a.i.) was detected. At the end of the study (126-DAT), carryover of the transformation products, 7-OH-XDE-742 and 6-Cl-7OH-XDE-742 was 0% and 0% of initial XDE-742 (a.i.), respectively.

11. SUPPLEMENTARY STUDY RESULTS: Samples for this field study were analyzed for XDE-742 and degradates after storage in frozen condition for a maximum of 588 days (ca. 20 months). In a separate, ongoing study (4), XDE-742 and degradates were stable in soil under frozen conditions for 6 months.

III. STUDY DEFICIENCIES:

1. USEPA: In an ongoing storage stability study, XDE-742, 5-OH-XDE-742, and 6-Cl-7-OH-XDE-742 were found to be relatively stable in frozen soil samples for six months (MRID 46908317). 7-OH-XDE-742 displayed reduced recovery over six months in a loam soil. Samples in this study were stored as long as 588 days. Average sample storage times were 376, 419, 402 and 428 days for AB, SK1, SK2 and MB, respectively. Therefore, pending results from the completed storage stability study, the dissipation kinetics of this study are uncertain.

IV. REVIEWER'S COMMENTS:

1. Cloquintocet-methyl is registered for use in Canada, the US and is listed as registered in Australia on the PAN site, therefore, this portion of the study was not included in the PMRA review. However, based on the review of the XDE-742 portion of the study, the results are expected to be acceptable.

2. The Ecoregions provided were incorrect and corrections were made. Only sites SK2 and MB are found in Ecoregions relevant to use sites in the U.S. and are, therefore, relevant to the USEPA.

3. Detections between the LOD and LOQ were changed to (LOQ+LOD/2) for all calculations, rather than using the values presented. LOD and LOQ values were converted from µg/g to g/ha based on a 15 cm soil depth and the reported bulk density for the top 15 cm of soil for calculation purposes.

4. The applicant reported the percent of parent and transformation product in the soil based on nominal applied parent. However, this is not the method used by the PMRA. Rather, the initial (or maximum parent measured) is used to calculate the percent of transformation product in the soil (based on parent equivalent concentrations).

5. Concentrations for each sampling depth were added and then the percentage recovered was determined based on nominal parent. The concentrations cannot be added, therefore, percentage recovery values have been re-calculated for each sampling depth separately based on initial parent concentration.

6. Parent equivalents were calculated to be 1.03 for 7-OH-XDE-742 and 0.96 for 6-Cl-7-OH-XDE-742. No value was determined for 5-OH-XDE-742 due to the very low detections.

7. The PMRA does not use Model Maker, however, DT50 calculations were recalculated using SygmaPlot. Simple first order kinetic models were used for all sites except AB. In AB, a double first order in parallel model was used. Recalculated values were similar to those in the study report. Therefore, applicant values were accepted, except for the DT90 for the AB site, where the PMRA value for the DT90 of 239 days is reported, instead of the 97 days reported in the study report. The USEPA calculated half-lives using Microsoft® Office Excel.

8. Carry-over was determined based on the concentrations in the soil at study termination. The PMRA determines carry-over as what is present at the start of the next growing season, therefore, some of these numbers changed. The trigger of 30% carry-over was not met.

9. In the supplementary study, XDE-742 and its transformation products were found to be stable in frozen soil samples for six months. However, study samples were stored as long as 588 days. Average sample storage times were 376, 419, 402 and 428 days for AB, SK1, SK2 and MB, respectively. Therefore, the most conservative value should be used in any risk assessment.

10. Australian Reviewers Comments: The above comments by the Canadian reviewer are noted and these don't affect the reliability of the study. The Australian reviewer checked the DT50 for the parent using simple first order (SFO) kinetics and obtained similar results for SK1, SK2 and MB, as given by the applicant. For AB, the results were longer but for the first 68 days the DT50 was calculated as 32 days, compared to the applicant reported value of 29 days using a non-linear multi-compartment model. Therefore, the DT50 is accepted. However, the Australian reviewer calculated the DT90 as 434 days (all data used) and 248 days with a winter adjustment compared to 97 days given by the applicant. The applicant's DT90 appears to have been

determined using a SFO kinetics (ie DT90 = ln(10)/k) where the kinetic rate used was determined from the multi-compartment model and only the quickest rate was used, which is not acceptable. Also, after 120 and 370 days there was 11 and 12% of applied left, respectively, and, therefore, the calculated DT90 of 68 days does not reflect the experimental results. Overall, the study is rated as acceptable for Australia, noting the problem of the DT90 for the Alberta site.

V. REFERENCES

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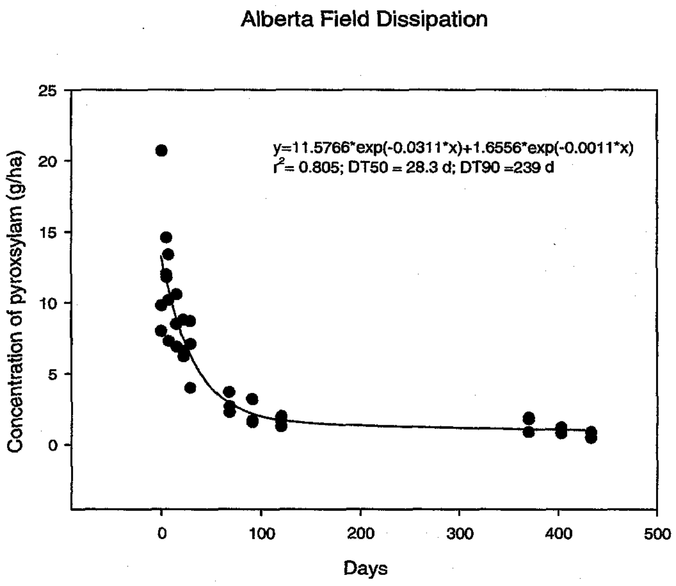
Data Evaluation Report on the terrestrial field dissipation of GF-1442

PMRA Submission 2006-4728; EPA MRID Number 46908334; APVMA ATS 40362

APPENDIX 1. Statistical verification output from the PMRA reviewer.



Nonlinear Regression

```
[Variables]
x = col(1)
y = col(2)
reciprocal_y=1/abs(y)
reciprocal_ysquare=1/y^2
'Automatic Initial Parameter Estimate Functions
xnear0(q)=max(abs(q))-abs(q)
yatxnear0(q,r)=xatymax(q,xnear0(r))
[Parameters]
a = yatxnear0(y,x)/2 "Auto {{previous: 11.5766}}
b = if(x50(x,y)-min(x)=0, 1, -ln(.5)/(0.5*(x50(x,y)-min(x)))) "Auto {{previous: 0.0311455}}
c = yatxnear0(y,x)/2 "Auto {{previous: 1.65563}}
d = if(x50(x,y)-min(x)=0, .5, -ln(.5)/(1.5*(x50(x,y)-min(x)))) "Auto {{previous: 0.0011137}}
[Equation]
f= a*exp(-b*x)+c*exp(-d*x)
fit f to y
"fit f to y with weight reciprocal_y
"fit f to y with weight reciprocal_ysquare
[Constraints]
b>0
d>0
[Options]
tolerance=1e-6
stepsize=0.1
iterations=100
```

R = 0.90634544 Rsqr = 0.82146206 Adj Rsqr = 0.80472413

Standard Error of Estimate = 2.1775

	Coefficient	**Std. Error**	**t**	**P**
a	11.5766	1.9207	6.0272	<0.0001
b	0.0311	0.0118	2.6389	0.0127
c	1.6556	2.0034	0.8264	0.4147
d	0.0011	0.0038	0.2924	0.7719

Analysis of Variance:

	DF	**SS**	**MS**	**F**	**P**
Regression	3	698.1357	232.7119	49.0779	<0.0001
Residual	32	151.7340	4.7417		
Total	35	849.8697	24.2820		

PRESS = 216.0694

Durbin-Watson Statistic = 2.8420

Normality Test: K-S Statistic = 0.1749 Significance Level = 0.1994

Constant Variance Test: Failed (P = <0.0001)

Power of performed test with alpha = 0.0500: 1.0000

Regression Diagnostics:

Row	**Predicted**	**Residual**	**Std. Res.**	**Stud. Res.**	**Stud. Del. Res.**
1	13.2323	-5.2323	-2.4028	-2.6846	-3.0019
2	13.2323	7.4677	3.4294	3.8316	5.1263
3	13.2323	-3.4323	-1.5762	-1.7611	-1.8240
4	11.5536	0.2464	0.1131	0.1182	0.1164
5	11.5536	3.0464	1.3990	1.4617	1.4892
6	11.5536	0.4464	0.2050	0.2142	0.2110
7	10.9517	-0.7517	-0.3452	-0.3577	-0.3527
8	10.9517	2.4483	1.1244	1.1650	1.1718
9	10.9517	-3.6517	-1.6770	-1.7376	-1.7971
10	8.8840	-1.9840	-0.9111	-0.9477	-0.9462
11	8.8840	1.7160	0.7880	0.8197	0.8154
12	8.8840	-0.3840	-0.1764	-0.1834	-0.1806
13	7.4500	-0.8500	-0.3904	-0.4116	-0.4062
14	7.4500	1.3500	0.6199	0.6536	0.6477
15	7.4500	-1.2500	-0.5741	-0.6053	-0.5992
16	6.2946	0.8054	0.3699	0.3926	0.3873
17	6.2946	2.4054	1.1046	1.1725	1.1796
18	6.2946	-2.2946	-1.0538	-1.1184	-1.1230
19	2.9274	-0.6274	-0.2881	-0.3017	-0.2974
20	2.9274	0.7726	0.3548	0.3716	0.3665
21	2.9274	-0.2274	-0.1044	-0.1094	-0.1077
22	2.1763	-0.4763	-0.2188	-0.2327	-0.2292
23	2.1763	1.0237	0.4701	0.5001	0.4941
24	2.1763	-0.5763	-0.2647	-0.2815	-0.2775
25	1.7242	-0.4242	-0.1948	-0.2116	-0.2084
26	1.7242	-0.0242	-0.0111	-0.0121	-0.0119
27	1.7242	0.2758	0.1267	0.1376	0.1354

28	1.0966	0.7034	0.3230	0.3397	0.3349
29	1.0966	0.8034	0.3689	0.3879	0.3827
30	1.0966	-0.1966	-0.0903	-0.0949	-0.0935
31	1.0570	0.1430	0.0657	0.0697	0.0686
32	1.0570	-0.2570	-0.1180	-0.1252	-0.1232
33	1.0570	-0.2570	-0.1180	-0.1252	-0.1232
34	1.0222	-0.1222	-0.0561	-0.0602	-0.0592
35	1.0222	-0.1222	-0.0561	-0.0602	-0.0592
36	1.0222	-0.5222	-0.2398	-0.2571	-0.2533

Influence Diagnostics:

Row	**Cook'sDist**	**Leverage**	**DFFITS**
1	0.4474	0.1989	-1.4959
2	0.9114	0.1989	2.5545
3	0.1925	0.1989	-0.9089
4	0.0003	0.0839	0.0352
5	0.0489	0.0839	0.4508
6	0.0011	0.0839	0.0639
7	0.0024	0.0686	-0.0957
8	0.0250	0.0686	0.3179
9	0.0556	0.0686	-0.4875
10	0.0184	0.0757	-0.2708
11	0.0138	0.0757	0.2334
12	0.0007	0.0757	-0.0517
13	0.0047	0.1004	-0.1357
14	0.0119	0.1004	0.2164
15	0.0102	0.1004	-0.2002
16	0.0049	0.1123	0.1378
17	0.0435	0.1123	0.4196
18	0.0396	0.1123	-0.3995
19	0.0022	0.0883	-0.0926
20	0.0033	0.0883	0.1141
21	0.0003	0.0883	-0.0335
22	0.0018	0.1162	-0.0831
23	0.0082	0.1162	0.1792
24	0.0026	0.1162	-0.1006
25	0.0020	0.1522	-0.0883
26	0.0000	0.1522	-0.0050
27	0.0008	0.1522	0.0574
28	0.0030	0.0955	0.1088
29	0.0040	0.0955	0.1244
30	0.0002	0.0955	-0.0304
31	0.0002	0.1115	0.0243
32	0.0005	0.1115	-0.0437
33	0.0005	0.1115	-0.0437
34	0.0001	0.1297	-0.0229
35	0.0001	0.1297	-0.0229
36	0.0025	0.1297	-0.0978

95% Confidence:

Row	**Predicted**	**Regr. 5%**	**Regr. 95%**	**Pop. 5%**	**Pop. 95%**
1	13.2323	11.2540	15.2105	8.3756	18.0889
2	13.2323	11.2540	15.2105	8.3756	18.0889
3	13.2323	11.2540	15.2105	8.3756	18.0889
4	11.5536	10.2686	12.8387	6.9357	16.1715

5	11.5536	10.2686	12.8387	6.9357	16.1715
6	11.5536	10.2686	12.8387	6.9357	16.1715
7	10.9517	9.7903	12.1130	6.3666	15.5367
8	10.9517	9.7903	12.1130	6.3666	15.5367
9	10.9517	9.7903	12.1130	6.3666	15.5367
10	8.8840	7.6634	10.1046	4.2836	13.4844
11	8.8840	7.6634	10.1046	4.2836	13.4844
12	8.8840	7.6634	10.1046	4.2836	13.4844
13	7.4500	6.0443	8.8558	2.7971	12.1030
14	7.4500	6.0443	8.8558	2.7971	12.1030
15	7.4500	6.0443	8.8558	2.7971	12.1030
16	6.2946	4.8079	7.7812	1.6166	10.9726
17	6.2946	4.8079	7.7812	1.6166	10.9726
18	6.2946	4.8079	7.7812	1.6166	10.9726
19	2.9274	1.6092	4.2455	-1.6999	7.5546
20	2.9274	1.6092	4.2455	-1.6999	7.5546
21	2.9274	1.6092	4.2455	-1.6999	7.5546
22	2.1763	0.6642	3.6885	-2.5099	6.8625
23	2.1763	0.6642	3.6885	-2.5099	6.8625
24	2.1763	0.6642	3.6885	-2.5099	6.8625
25	1.7242	-0.0062	3.4546	-3.0369	6.4853
26	1.7242	-0.0062	3.4546	-3.0369	6.4853
27	1.7242	-0.0062	3.4546	-3.0369	6.4853
28	1.0966	-0.2742	2.4674	-3.5459	5.7391
29	1.0966	-0.2742	2.4674	-3.5459	5.7391
30	1.0966	-0.2742	2.4674	-3.5459	5.7391
31	1.0570	-0.4240	2.5379	-3.6193	5.7332
32	1.0570	-0.4240	2.5379	-3.6193	5.7332
33	1.0570	-0.4240	2.5379	-3.6193	5.7332
34	1.0222	-0.5750	2.6195	-3.6921	5.7365
35	1.0222	-0.5750	2.6195	-3.6921	5.7365
36	1.0222	-0.5750	2.6195	-3.6921	5.7365

Solutions:
28.3397829487
Solutions:
238.81632223426