DATA EVALUATION RECORD

STUDY 6

CHEM 129034 Flumioxazin §164-1
CAS No. 103361-09-7
FORMULATION--06--WETTABLE POWDER

STUDY ID 44295044
Pensyl, J. W. 1996. Terrestrial field dissipation study with V-53482 WP herbicide on no-till ground in Illinois. Valent Project No.: VP-11278. Unpublished study performed and submitted by Valent U.S.A. Corporation, Dublin, CA (analytical phase); and Valent U.S.A. Corporation, Seymour, IL (in-life phase); and submitted by Valent U.S.A. Corporation, Dublin, CA.

STUDY ID 44295042
Kruplak, J. F. 1995. Independent laboratory validation of the method of quantitation of flumioxazin in soil. ADC Project Number: 1550-1. Unpublished study performed by Analytical Development Corporation, Colorado Springs, CO; and submitted by Valent U.S.A. Corporation, Walnut Creek, CA.

DIRECT REVIEW TIME = 45 Hours

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CONCLUSIONS

Field Dissipation - Terrestrial

1. This study is scientifically valid and provides useful information on the terrestrial field dissipation of flumioxazin on a no-till bareground plot of silt loam soil in Illinois.

2. This study does not meet Subdivision N Guidelines for the partial fulfillment of EPA data requirements on terrestrial field dissipation for the following reason:

   (i) soil samples were not analyzed for degradates; therefore, the patterns of formation and decline of degradates could not be addressed.

3. Flumioxazin (VP-53482 WP, 51.4% a.i.), broadcast applied once as a spray at a nominal application rate of 43.2 g a.i./A, dissipated with a registrant calculated half-life of 12.5 days (0-28 day data; $r^2 = 0.85$) on a no-till bareground plot (containing crop residues) of silt loam soil in Illinois. The observed first half-life occurred between 3 and 7 or 14 days posttreatment. However, the half-life of the parent is of questionable worth since the data utilized in the half-life calculation were determined on a wet-weight basis. Residue data were reported as means of three replicates unless otherwise noted. The parent compound was initially present in the 0- to 7.5-cm depth at 0.069 ppm, decreased to 0.064 ppm by 3 days and 0.025 ppm by 7 days (the next sampling interval), was 0.029 ppm at 14 days, was 0.014-0.021 ppm from 21 to 59 days, and was not detected above the limit of quantitation following 59 days with the exception of 0.011 ppm (one of three replicates) at 122 and 241 days. The parent compound was not detected above the limit of quantitation below the 0- to 7.5-cm depth. Samples were not analyzed for degradates of flumioxazin.

METHODOLOGY

Flumioxazin (VP-53482 WP, 51.4% a.i.; p. 14) was broadcast applied once as a spray at a nominal application rate of 43.2 g a.i./A, onto a no-till, bareground (containing crop residues) plot (60 x 60 ft with nine subplots of 20 x 20 ft, <1% slope; p. 14; Appendix VII, p. 137) of silt loam soil (0-30 cm: 25% sand, 55% silt, 20% clay, 4.2% organic matter, pH 5.9, CEC 24.3 meq/100 g; p. 15) in Champaign, IL. The test substance was mixed with the adjuvant Wilfarm Crop Oil Plus (1%) and applied within forty minutes of mixing (p. 17). The application was made using a tractor-mounted sprayer with six nozzles and a boom height of 15 inches above the soil. An untreated control plot (20 x 20 ft with 16 subplots of 5 x 5 ft each) was located 50 feet from the treated plot (p. 14). The depth to the water table was 3.5 feet. A three-year plot history indicated prior use of a closely related compound (Appendix VII, p. 139; see Comment #3). Prior to flumioxazin application, plots were treated once each with Aatrex® 90 WDG (atrazine, 2 lb/A), Lasso® 4 EC (alachlor, 3 lb/A), and Select® 2 EC (clethodim, 0.05 lb/A), and twice with

Roundup® 4S (glyphosate, 1 lb/A) to maintain bareground conditions (Appendix VII, p. 140); following flumioxazin application, plots were treated four times with Roundup® 4S (1-2 lb/A). Precipitation was supplemented with irrigation; total water input (42.4 inches) was 102% of the 10-year mean annual precipitation (p. 18). Through 30 days posttreatment, water input (4.5 inches) was 123% of the 10-year mean annual precipitation. Precipitation data were collected on-site. Pan evaporation data were not reported.

Soils samples were collected from the treated plot one day prior to the application and at 0, 3, 7, 14, 21, 28, 42, 59, 91, 122, 241, and 365 days posttreatment; the control plot was sampled one day prior to the application and at 0, 3, 14, 28, 59, 122, 241, and 365 days posttreatment (p. 19). At each sampling interval, three cores were randomly collected from five designated subplots within the treated plot (15 total; Appendix VII, p. 137) and three soil cores were collected from the control plot (p. 18). A 0- to 15-cm depth sample (4-inch i.d.) and a 15- to 90-cm depth sample (2-inch i.d.) were collected using a three-stage zero-contamination probe equipped with acetate liners. Samples were stored frozen until shipped to the analytical lab. At the analytical lab, frozen samples were sectioned, composted by depth, and stored frozen for up to 258 days until analysis (pp. 20, 26).

Soil samples were analyzed only for the parent compound (p. 20; see Comment #2). Soil samples (10 g) were extracted twice by shaking with acetone:0.1 *N* HCl (5:1, v:v) and filtered (Appendix II, p. 65). The extracts were partitioned with 5% aqueous sodium chloride and dichloromethane. The organic phase was filtered through sodium sulfate and partitioned a second time with dichloromethane. The combined extracts were concentrated by rotary evaporation, redissolved in hexane:ethyl acetate (2:1, v:v), and loaded onto a solid phase extraction column (Florisil). The parent compound was eluted from the column with hexane:ethyl acetate (2:1, v:v) and concentrated by rotary evaporation; extracts were redissolved in acetone and analyzed for the parent by GC (50% phenyl-methyl silicone megabore column) with a nitrogen-phosphorus flame ionization detector (Appendix II, pp. 64, 66); the limits of detection and quantitation were 0.005 ppm and 0.01 ppm, respectively (Appendix II, p. 67).

The application rate was not confirmed using monitoring pads or a similar method. The concentration of the parent in the 0- to 7.5-cm soil depth immediately following the application was 52% of the expected, based on the nominal application rate (p. 25).

To determine concurrent recoveries, soil samples (0- to 7.5-cm) were fortified separately with the parent compound at 0.01 ppm and 0.05 ppm or 0.02 ppm and 0.10 ppm (pre-treatment and day 0 samples; p. 22). Mean recoveries (± c.v.) from soil samples fortified at 0.01 ppm, 0.02 ppm, 0.05 ppm, and 0.10 ppm were 98 ± 12%, 90 ± 15.7%, 107 ± 12.0%, and 110 ± 8.9% (3 of 15 samples >120%), respectively (Table II, pp. 34-35).

Independent Method Validation (MRID 44295042)

Duplicate soil samples (source and texture not specified) were fortified with the parent compound at 0.01 ppm and 0.05 ppm (p. 11). Samples were extracted and analyzed by GC (J & W DB-17 column) as previously described for the test samples (pp. 12, 13); the limit of detection was 0.004 ppm (p. 15). Recoveries (across all fortifications) of the parent ranged from 85% to 90% (Table 2, p. 18).

DATA SUMMARY

Flumioxazin (VP-53482 WP, 51.4% a.i.), broadcast applied once as a spray at a nominal application rate of 43.2 g a.i./A, dissipated with a registrant calculated half-life of 12.5 days (0-28 day data; $r^2 = 0.85$) on a no-till bareground plot (containing crop residues) of silt loam soil in Illinois (Figure 2, p. 38). The observed first half-life occurred between 3 and 7 or 14 days posttreatment. However, the half-life of the parent is of questionable worth since the data utilized in the half-life calculation were determined on a wet-weight basis. Residue data were reported as means of three replicates unless otherwise noted. The parent compound was initially present in the 0- to 7.5-cm depth at 0.069 ppm, decreased to 0.064 ppm by 3 days and 0.025 ppm by 7 days (the next sampling interval; range of 0.015-0.037), was 0.029 ppm (range of 0.026-0.034) at 14 days posttreatment, was 0.014-0.021 ppm from 21 to 59 days posttreatment, and was not detected above the limit of quantitation following 59 days with the exception of 0.011 ppm (one of three replicates) at 122 and 241 days posttreatment (p. 23; Table I, pp. 32, 33). The parent compound was not detected above the limit of quantitation below the 0- to 7.5-cm depth. Samples were not analyzed for degradates of flumioxazin.

COMMENTS

1. The registrant-calculated half-life of the parent compound is of questionable worth because the data were reported on a wet-weight basis. Because the moisture in the soil samples was not consistent over time (Appendix IV, pp. 103-117), the resulting concentration data may not be validly compared over time, as a dilution or concentration effect may occur. All data should be reported on a dry-weight basis (corrected for moisture content). Additionally, the half-life was based on data from the 0- to 3-inch depth, rather than the 0- to 6-inch depth. However, the reviewer noted that the parent was not detected above the limit of quantitation below the 0- to 7.5-cm depth (Table I, pp. 32, 33).

2. The study failed to adequately demonstrate the field dissipation of the test compound. The parent did not leach, but degraded relatively rapidly. However, the patterns of formation and decline of degradates were not addressed. Soil samples were not analyzed for degradates of flumioxazin. One of the primary purposes of a terrestrial field

dissipation study is the determination of the patterns of formation and decline of major degradates of the parent. However, the study author stated that in two aerobic soil metabolism studies (MRID's 42684906 and 42884009) conducted with radiolabeled flumioxazin, only minor degradates (≤0.1 ppm or ≤6.6% of the applied radioactivity) were detected.

3. The site had a known previous use history of a compound related to the test compound. The plot was treated in the past with the phthalimide analogue compound flumiclorac-pentyl (Resource®, 0.026 lb a.i./A; two years prior to the application of flumioxazin; Appendix VII, p. 139). Subdivision N Guidelines require that the site have no previous use history involving the test compound or closely related compounds.

4. Pan evaporation data were not reported. Such data are necessary to determine water balances and to assess whether sufficient moisture was present in the soil to facilitate leaching of the test substance. Through 30 days posttreatment, water input (4.5 inches) was 123% of the 10-year mean annual precipitation (p. 18).

5. Soil samples were stored frozen for a maximum of 258 days prior to extraction (p. 26, Table III, p. 36); however frozen storage stability data were not submitted. Frozen storage stability data are necessary to determine the stability of the parent compound and its degradates in the test soil under typical storage conditions. The study author stated that a frozen storage stability study was not necessary because frozen storage stability studies submitted with terrestrial field dissipation studies conducted in Mississippi (MRID 44295045) and Iowa (MRID 44295046) demonstrated that the parent compound was stable in soil stored frozen for over 400 days (p. 26). Storage stability studies should be conducted using soil samples collected from the test site that are fortified separately with the parent compound and its degradates and stored for a duration of time equal to the longest storage interval for the test samples. The use of samples from a different site may not accurately reflect the storage stability of the test compound and its degradates in the test site soil.

6. Confirmation of the application rate was not performed. Typically, application monitoring pads or similar devices of a known surface area are utilized to verify the application rate.

7. The study was conducted at one site (Illinois). Additional terrestrial field dissipation studies conducted in Mississippi (MRID 44295045), Iowa (MRID 44295046), Indiana (MRID 44295047), and North Carolina (MRID 44295048), were also submitted.

8. The nominal application rate for the test compound (43.2 g a.i./A) was approximately equivalent to the proposed maximum use rate for soybeans (43.4 g a.i./A; p. 13).

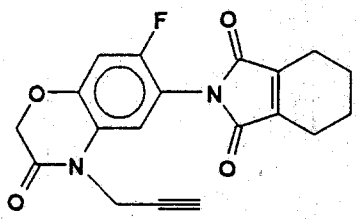
9. The study author reported that the soil at the test site was a Drummer silty clay loam soil (Appendix VII, p. 138); however, based on soil characterization data reported for the top 0-30 cm soil depth (p. 15), the reviewer reported the soil as a silt loam.

10. Irrigation water characterization data were not reported.

MATERIALS

TEST SUBSTANCE

V-53482 WP Herbicide was used as the test substance in this study. V-53482 WP Herbicide is a wettable powder formulation containing nominally 51% of technical flumioxazin as the active ingredient:



Common Names: flumioxazin, V-53482, S-53482
Chemical Name: 7-fluoro-6-((3,4,5,6,-tetrahydro)phthalimido)-4-(2-propynyl)-1,4-benzoxazin-3(2H)-one

CAS#:	103361-09-7
Batch#:	VS-15A-05 (Sumitomo Lot # EC01L31)
% Assay:	51.4% flumioxazin

This test substance was provided by Sumitomo Chemical. Analysis of this material was performed by Sumitomo before study initiation.

REFERENCE STANDARD

Analytical grade flumioxazin was used in the analytical phase of this study. Two batches of material were used: Lot # As 1663c and Lot # As 1663g. Both batches were certified by Valent prior to study initiation. The assays were 99.9% and 99.8%, respectively.

TEST SITE

The test site for this study was located at Valent's Midwest Agricultural Research Center in Champaign, Illinois. A Residue Trial Map indicating the location of the test site is shown as Figure 1. Field and plot maps are found in the Field Residue Data Book (FRDB) in Appendix VII.

In summary, the treated test plot was 60 x 60 ft containing nine equal 20 x 20 ft sections. The four corner sections and the middle section were designated A, B, C, D, and E and were used for sample collection. Each section was further divided into sixteen 5 x 5 ft subplots and numbered 1-16. The untreated control plot contained sixteen 5 x 5 ft subplots numbered 1-16. There was a 50 ft buffer zone between the treated and untreated plots. The depth to ground water was 3.5 feet. The test plot area was relatively flat with a slope of <1%. A manmade subsurface drainage system was installed in the field.

MATERIALS (CONTINUED)

SOIL CHARACTERIZATION

Soil characteristics for both the treated and control plots were determined in 30 cm increments to a depth of 90 cm. Fifteen representative cores (2 inch diameter) were collected from the proposed treated plot and three from the proposed untreated control (UTC) plot for characterization. The cores were cut into 30 cm segments and composited by depth. Soil analysis reports are found in Appendix VII. The treated plot data are summarized in the following table:

Summary of Soil Characterization (Treated Plot)

Physical Property	Depth, cm		
	0-30	30-60	60-90
% Sand	25	23	21
% Silt	55	43	47
% Clay	20	34	32
% Organic Matter	4.2	1.2	0.8
pH	5.9	6.6	7.3
Exchange Cap (meq/100 g)	24.3	28.1	28.2
Field Capacity (1/3 bar)	32.9	36.6	35.5
Bulk Density	1.05	1.04	1.07
Textural Classification	Silt Loam	Clay Loam	Clay Loam

WEATHER DATA

Weather information collected at the test site and at the Water Survey Research Center (Illinois State Water Survey) in Champaign, IL during the study can be found in Appendix VII along with historical data collected at the Midwestern Climate Center in Urbana, IL. A summary of the weather data for the duration of the study is tabulated below:

MATERIALS (CONTINUED)

Summary of Weather Conditions During Study

Study Month & Year	On-Site Air Temp, °F		% Humidity (Collected at Illinois State Water Survey)		Total Rainfall, in. On Site
	Min	Max	Min	Max	
August 1995*	57	93	46	100	3.07
September 1995	30	88	22	100	0.41
October 1995	28	83	22	100	3.28
November 1995	12	65	0	100	1.71
December 1995*	-2	62	22	100	1.05
January 1996**	-11	59	34	100	1.75
February 1996	-17	66	26	100	1.04
March 1996	3	69	24	100	2.39
April 1996	22	80	22	100	3.63
May 1996**	36	84	20	100	7.70
June 1996	49	95	30	100	4.59
July 1996	50	92	28	100	3.18

* Some humidity data points missing due to equipment failure.
** Some temperature and rainfall data taken from the Illinois State Water Survey in Champaign, IL due to equipment failure at the test site.

A comparison of the monthly rainfall during the study with historical rainfall information is presented with the irrigation data in the next section of this report.

PLOT HISTORY

In 1992, the test site was planted with soybeans and treated with Freedom, Basagran, and Fusilade. In 1993, the test site was planted with corn and treated with Lasso, Resource, and Laddock. In 1994, the test site was fallow and treated with no pesticides. In 1995, four days before the application of test substance, the plot area was mowed. Complete pesticide history can be found in the FRDB in Appendix VII.

TEST METHOD (CONTINUED)

Summary of Irrigation and Rainfall at Test Site

Study Month	10 Year Avg Rainfall Inches	Rainfall During Study, Inches	Irrigation Applied Inches	Total Inches	% of Monthly Normal Precip.
August	3.67	3.07	1.46	4.53	123
September	3.58	0.41	1.22	1.63	46
October	3.07	3.28	3.14	6.42	209
November	4.73	1.71	0	1.71	36
December	2.81	1.05	0	1.05	37
January	1.51	1.75	0	1.75	116
February	2.20	1.04	0	1.04	47
March	2.76	2.39	0	2.39	87
April	3.88	3.63	0	3.63	94
May	4.47	7.7	0	7.7	172
June	3.66	4.59	0	4.59	125
July	5.14	3.18	2.80	5.98	116
Totals	41.5	33.8	8.62	42.4	102

SAMPLE COLLECTION

At each sampling interval, soil cores were collected to a depth of 90 cm using a 3-stage zero contamination probe equipped with acetate liners, attached to a Giddings hydraulic soil probe. The 0-15 cm core was taken first using a 15 cm excavation probe (4 inch diameter). After removing the 0-15 cm core, the 3-stage probe left a sleeve in the hole that cased the hole to eliminate contamination of deeper soil with surface soil. The 15-90 cm cores were taken by inserting a 2 inch diameter probe into the sleeve.

The untreated control plot was always sampled prior to the treated plot. Soil cores were collected from designated subplots as described in the study protocol. At each scheduled sampling interval, three cores were collected from each of the five designated subplots in the treated plot and from the designated subplot in the untreated control plot.

TABLE I
RESIDUES OF FLUMIOXAZIN IN ILLINOIS SOIL (TRIAL V-11278)

Sampling Event	Sampling Interval	Sampling Date	Flumioxazin Found, ppm					
			0-7.5 cm	7.5-15 cm	15-30 cm	30-45 cm	45-60 cm	60-90 cm
1	Day -1	7/31/95	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005
2	Day 0	8/1/95	0.068 0.057 0.081	<0.005 <0.005 0.005	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005
3	Day 3	8/4/95	0.091 0.052 0.049	<0.005 0.007 <0.005	<0.005 <0.005 <0.005			
4	Day 7	8/8/95	0.037 0.024 0.015	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005			
5	Day 14	8/15/95	0.034 0.026 0.028	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005			
6	Day 21	8/22/95	0.017 0.021 0.016	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005			
7	Day 28	8/29/95	0.015 0.013 0.013	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005			

TABLE I (CON'T)
RESIDUES OF FLUMIOXAZIN IN ILLINOIS SOIL (TRIAL V-11278)

Sampling Event	Sampling Interval	Sampling Date	Flumioxazin Found, ppm					
			0-7.5 cm	7.5-15 cm	15-30 cm	30-45 cm	45-60 cm	60-90 cm
8	Day 42	9/12/95	0.013 0.017 0.016	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005
9	Day 59	9/29/95	0.020 0.022 0.022	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005			
10	Day 91	10/31/95	0.006 <0.005 <0.005	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005			
11	Day 122	12/1/95	0.009 0.008 0.011	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005			
12	Day 180	No Sample - Ground Frozen						
13	Day 241	3/29/96	0.011 <0.005 0.006	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005			
14	Day 365	7/31/96	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005	<0.005 <0.005 -[1]	<0.005 <0.005 <0.005

[1] Interference present in this sample. Reinjection of extract showed <0.005, <0.005 ppm.

Table II

Recovery of Flumioxazin From Illinois Soil

Date Analyzed	Amount Added (ppm)	Amount Found (ppm)	% Recovery
7/12/95	0.020	0.020	97
3/21/96	0.020	0.018	74
3/22/96	0.020	0.021	100
	Mean Recovery	(0.020 ppm level)	90
	CV (n = 3)		15.7
3/29/96	0.010	0.010	96
4/17/96	0.010	0.010	102
4/01/96	0.010	0.009	93
4/02/96	0.010	0.010	101
4/03/96	0.010	0.010	98
4/05/96	0.010	0.010	104
4/08/96	0.010	0.008	84
3/26/96	0.010	0.010	97
3/28/96	0.010	0.011	103
4/10/96	0.010	0.011	109
4/12/96	0.010	0.012	118
4/09/96	0.010	0.011	106
4/12/96	0.010	0.011	110
8/12/96	0.010	0.007	71
8/12/96	0.010	0.010	96
8/12/96	0.010	0.009	81
	Mean Recovery	(0.010 ppm level)	98
	CV (n = 16)		12.0

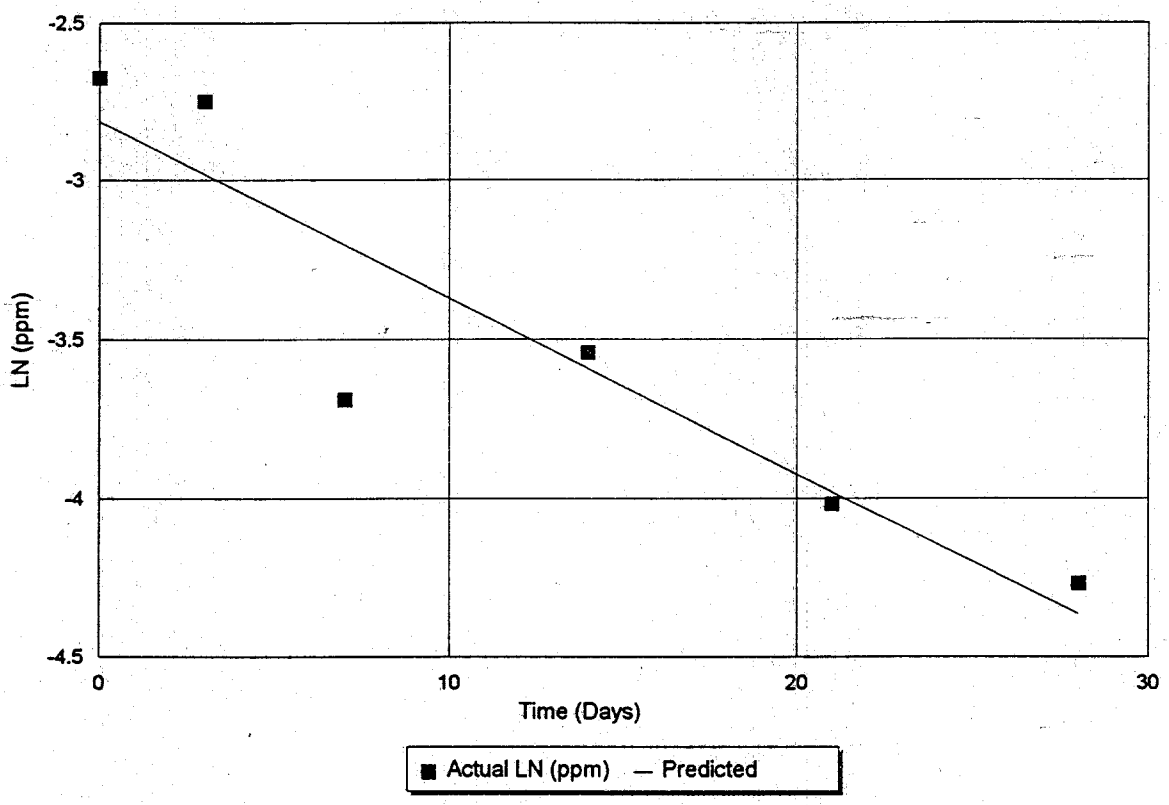
Table II (Continued)

Recovery of Flumioxazin From Illinois Soil

Date Analyzed	Amount Added (ppm)	Amount Found (ppm)	% Recovery
7/12/95	0.100	0.119	118
3/21/96	0.100	0.096	93
3/22/96	0.100	0.112	111
	Mean Recovery	(0.100 ppm level)	107
	CV (n = 3)		12.0
3/29/96	0.050	0.052	102
4/17/96	0.050	0.058	116
4/01/96	0.050	0.049	98
4/02/96	0.050	0.053	106
4/03/96	0.050	0.054	108
4/05/96	0.050	0.053	106
4/08/96	0.050	0.058	116
3/26/96	0.050	0.052	103
3/28/96	0.050	0.057	113
4/10/96	0.050	0.061	121
4/12/96	0.050	0.063	126
4/09/96	0.050	0.062	123
4/12/96	0.050	0.060	120
8/12/96	0.050	0.047	94
8/12/96	0.050	0.052	101
	Mean Recovery	(0.050 ppm level)	110
	CV (n = 15)		8.93

FIGURE 2

Decline of Flumioxazin From Illinois Soil
1995 TRIAL V-11278



Log Least Square Estimate of 'm' and 'b' for:
Y = b*EXP(mX) (or LN Y = mX + LN b) and for correlation coefficient 'r'.

m=	-0.05548	
LN b=	-2.81466	
b=	0.05992	
Half-life=	12.49	Days
r=	-0.92134	

X (Days)	Y (ppm)	LN Y	LN YP	YP	Residual
0	0.069	-2.67365	-2.81466	0.059925	-0.14101
3	0.064	-2.74887	-2.9811	0.050737	-0.23223
7	0.025	-3.68888	-3.20302	0.040639	0.485864
14	0.029	-3.54046	-3.59137	0.027561	-0.05091
21	0.018	-4.01738	-3.97972	0.018691	0.037662
28	0.014	-4.2687	-4.36807	0.012676	-0.09938

STUDY NUMBER: V-11278
CHEMICAL: V-53482 WP
CROP/PART: Soil
EXTRACTION REF: 11278-002

DISH NUMBER	SAMPLE NUMBER	GROSS WEIGHT	TARE WEIGHT	SAMPLE WEIGHT	GR. DRY WEIGHT	% MOISTURE
26	1U-1	8.890	2.240	6.650	7.950	14.1%
14	1U-2	8.840	2.230	6.610	7.690	17.4%
13	1U-3	8.710	2.230	6.480	7.460	19.3%
11	1X-1	8.910	2.250	6.660	7.870	15.6%
8	1X-2	7.730	1.550	6.180	6.580	18.6%
10	1X-3	8.360	2.240	6.120	7.120	20.3%
25	1X-4	8.85	2.22	6.630	7.55	19.6%
17	1X-5	8.300	1.570	6.730	6.990	19.5%
15	1X-6	7.690	1.340	6.350	6.460	19.4%
28	1Y-1	8.700	2.250	6.450	7.810	13.8%
23	1Y-2	8.720	2.270	6.450	7.580	17.7%
22	1Y-3	8.510	2.200	6.310	7.230	20.3%
8	1Y-4	8.59	2.24	6.350	7.36	19.4%
29	1Y-5	8.72	2.22	6.500	7.49	18.9%
2	1Y-6	8.890	2.220	6.670	7.640	18.7%
17	1Z-1	8.850	2.240	6.610	7.880	14.7%
12	1Z-2	8.690	2.230	6.460	7.520	18.1%
24	1Z-3	8.850	2.210	6.640	7.510	20.2%
1	1Z-4	8.660	2.230	6.430	7.400	19.6%
9	1Z-5	8.780	2.200	6.580	7.540	18.8%
30	1Z-6	8.71	2.21	6.500	7.46	19.2%

ANALYST John Kowalsky METHOD: ✓ 135 C FOR 2 HOURS IN OVEN.

DATE 5/21/96 BALANCE ID: B-18 OVEN ID: OV-1

16

STUDY NUMBER: V-11278
CHEMICAL: V-53482 WP
CROP/PART: Soil
EXTRACTION REF: 11278-006

DISH NUMBER	SAMPLE NUMBER	GROSS WEIGHT	TARE WEIGHT	SAMPLE WEIGHT	GR. DRY WEIGHT	% MOISTURE
11	2U-2	8.740	2.250	6.490	7.570	18.0%
10	2X-1	9.030	2.240	6.790	7.990	15.3%
2	2X-2	8.790	2.220	6.570	7.680	16.9%
17	2X-3	8.660	2.240	6.420	7.390	19.8%
25	2Y-1	9.140	2.220	6.920	8.060	15.6%
14	2Y-2	8.620	2.230	6.390	7.430	18.6%
24	2Y-3	8.88	2.21	6.670	7.55	19.9%
28	2Z-1	9.380	2.250	7.130	8.330	14.7%
22	2Z-2	8.890	2.200	6.690	7.640	18.7%
9	2Z-3	9.400	2.210	7.190	7.920	20.6%

ANALYST Julian Kowalsky
DATE 3/28/96

METHOD: 135 C FOR 2 HOURS IN OVEN.
BALANCE ID: B-18 OVEN ID: OV1

17

STUDY NUMBER: V-11278
CHEMICAL: V-53482 WP
CROP/PART: Soil
EXTRACTION REF: 11278-016

DISH NUMBER	SAMPLE NUMBER	GROSS WEIGHT	TARE WEIGHT	SAMPLE WEIGHT	GR. DRY WEIGHT	% MOISTURE
23	2U-~~2-5~~ (VE 4/11/96)	8.500	2.260	6.240	7.240	20.2%
9	2X-4	9.100	2.210	6.890	7.740	19.7%
14	2X-5	8.450	2.240	6.210	7.270	19.0%
10	2X-6	9.040	2.240	6.800	7.740	19.1%
8	2Y-4	8.410	2.240	6.170	7.180	19.9%
17	2Y-5	8.830	2.250	6.580	7.590	18.8%
11	2Y-6	8.28	2.25	6.030	7.14	18.9%
28	2Z-4	9.350	2.250	7.100	7.920	20.1%
22	2Z-5	8.660	2.210	6.450	7.420	19.2%
24	2Z-6	8.890	2.210	6.680	7.590	19.5%

ANALYST Juliann Kowalsky
DATE 4/16/96

METHOD: 135 C FOR 2 HOURS IN OVEN.
BALANCE ID: B-18 OVEN ID: OV1

18

STUDY NUMBER: V-11278
CHEMICAL: V-53482 WP
CROP/PART: Soil
EXTRACTION REF: 11278-007

DISH NUMBER	SAMPLE NUMBER	GROSS WEIGHT	TARE WEIGHT	SAMPLE WEIGHT	GR. DRY WEIGHT	% MOISTURE
15	3U-1	7.760	1.570	6.190	6.390	22.1%
4	3X-1	8.150	1.530	6.620	6.660	22.5%
5	3X-2	8.610	1.570	7.040	7.180	20.3%
12	3X-3	8.000	1.540	6.460	6.650	20.9%
17	3Y-1	8.230	1.570	6.660	6.750	22.2%
45	3Y-2	7.750	1.350	6.400	6.510	19.4%
22	3Y-3	7.94	1.58	6.360	6.62	20.8%
21	3Z-1	8.900	1.570	7.330	7.220	22.9%
8	3Z-2	8.440	1.540	6.900	7.050	20.1%
24	3Z-3	7.750	1.520	6.230	6.430	21.2%

ANALYST Julian Kowalsky
METHOD: 135 C FOR 2 HOURS IN OVEN.

DATE 3/29/96
BALANCE ID: 3-18 OVEN ID: OV1

STUDY NUMBER: V-11278
CHEMICAL: V-53482 WP
CROP/PART: Soil
EXTRACTION REF: 11278-008

DISH NUMBER	SAMPLE NUMBER	GROSS WEIGHT	TARE WEIGHT	SAMPLE WEIGHT	GR. DRY WEIGHT	% MOISTURE
11	4X-1	9.630	2.250	7.380	8.010	22.0%
10	4X-2	8.300	2.240	6.060	7.050	20.6%
2	4X-3	9.470	2.220	7.250	7.920	21.4%
17	4Y-1	9.020	2.240	6.780	7.480	22.7%
25	4Y-2	8.550	2.240	6.310	7.250	20.6%
14	4Y-3	9.670	2.230	7.440	8.050	21.8%
24	4Z-1	8.73	2.21	6.520	7.24	22.9%
28	4Z-2	8.840	2.270	6.570	7.490	20.5%
22	4Z-3	9.490	2.210	7.280	7.910	21.7%

ANALYST Juliana Kowalsky
DATE 4/1/96

METHOD: 135 C FOR 2 HOURS IN OVEN.
BALANCE ID: B-18 OVEN ID: OV1

STUDY NUMBER: V-11278
CHEMICAL: V-53482 WP
CROP/PART: Soil
EXTRACTION REF: 11278-009

DISH NUMBER	SAMPLE NUMBER	GROSS WEIGHT	TARE WEIGHT	SAMPLE WEIGHT	GR. DRY WEIGHT	% MOISTURE
4	5U-1	50.000	43.270	6.730	48.920	16.0%
18	5X-1	47.590	40.920	6.670	46.580	15.1%
14	5X-2	53.830	45.780	8.050	52.290	19.1%
10	5X-3	59.730	52.510	7.220	58.270	20.2%
7	5Y-1	48.320	41.250	7.070	47.200	15.8%
1	5Y-2	52.950	46.630	6.320	51.710	19.6%
9	5Y-3	60.15	54.31	5.840	58.96	20.4%
11	5Z-1	51.730	45.910	5.820	50.780	16.3%
5	5Z-2	53.220	45.530	7.690	51.720	19.5%
6	5Z-3	53.880	47.290	6.590	52.550	20.2%

ANALYST Juliann Kowalsky
DATE 4/1/96

METHOD: 135 C FOR 2 HOURS IN OVEN.
BALANCE ID: B-18 OVEN ID: OV1

STUDY NUMBER: V-11278
CHEMICAL: V-53482 WP
CROP/PART: Soil
EXTRACTION REF: 11278-010

DISH NUMBER	SAMPLE NUMBER	GROSS WEIGHT	TARE WEIGHT	SAMPLE WEIGHT	GR. DRY WEIGHT	% MOISTURE
25	6X-1	9.140	2.220	6.920	7.890	18.1%
17	6X-2	8.700	2.240	6.460	7.440	19.5%
14	6X-3	8.720	2.240	6.480	7.380	20.7%
28	6Y-1	8.960	2.260	6.700	7.720	18.5%
11	6Y-2	8.920	2.250	6.670	7.580	20.1%
2	6Y-3	8.450	2.220	6.230	7.160	20.7%
23	6Z-1	9.37	2.27	7.100	8.03	18.9%
26	6Z-2	8.470	2.240	6.230	7.240	19.7%
10	6Z-3	9.070	2.240	6.830	7.660	20.6%

ANALYST Julian Kowalsky
DATE 4/4/96

METHOD: 135 C FOR 2 HOURS IN OVEN.
BALANCE ID: B-18 OVEN ID: OV1

22

STUDY NUMBER: V-11278
CHEMICAL: V-53482 WP
CROP/PART: Soil
EXTRACTION REF: 11278-011

DISH NUMBER	SAMPLE NUMBER	GROSS WEIGHT	TARE WEIGHT	SAMPLE WEIGHT	GR. DRY WEIGHT	% MOISTURE
13	7U-1	9.010	2.230	6.780	7.940	15.8%
22	7U-2	10.170	2.200	7.970	8.790	17.3%
24	7X-1	9.620	2.220	7.400	8.560	14.3%
8	7X-2	8.470	2.250	6.220	7.330	18.3%
30	7X-3	8.610	2.210	6.400	7.360	19.5%
12	7Y-1	8.310	2.230	6.080	7.430	14.5%
29	7Y-2	9.66	2.22	7.440	8.29	18.4%
1	7Y-3	8.230	2.230	6.000	7.060	19.5%
15	7Z-1	9.690	1.350	8.340	8.390	15.6%
27	7Z-2	8.980	2.200	6.780	7.740	18.3%
9	7Z-3	8.680	2.210	6.470	7.290	21.5%

ANALYST Juliann Kowalsky
METHOD: 135 C FOR 2 HOURS IN OVEN.
DATE 4/4/96
BALANCE ID: B-18 OVEN ID: OVI

STUDY NUMBER: V-11278
CHEMICAL: V-53482 WP
CROP/PART: Soil
EXTRACTION REF: 11278-004, 005

DISH NUMBER	SAMPLE NUMBER	GROSS WEIGHT	TARE WEIGHT	SAMPLE WEIGHT	GR. DRY WEIGHT	% MOISTURE
1	8X-1	52.740	46.630	6.110	51.760	16.0%
2	8X-2	46.700	40.520	6.180	45.520	19.1%
3	8X-3	47.810	40.620	7.190	46.350	20.3%
4	8X-4	50.040	43.270	6.770	48.720	19.5%
5	8X-5	51.760	45.530	6.230	50.600	18.6%
6	8X-6	53.680	47.290	6.390	52.510	18.3%
7	8Y-1	47.450	41.260	6.190	46.450	16.2%
8	8Y-2	47.200	39.120	8.080	45.670	18.9%
9	8Y-3	60.450	54.300	6.150	59.240	19.7%
10	8Y-4	59.060	52.510	6.550	57.820	18.9%
11	8Y-5	52.770	45.910	6.860	51.510	18.4%
12	8Y-6	51.240	44.670	6.570	50.030	18.4%
13	8Z-1	51.49	44.88	6.610	50.44	15.9%
14	8Z-2	52.280	45.780	6.500	51.070	18.6%
15	8Z-3	46.150	39.810	6.340	44.890	19.9%
16	8Z-4	51.880	45.780	6.100	50.720	19.0%
17	8Z-5	50.300	43.930	6.370	49.110	18.7%
18	8Z-6	47.340	40.920	6.420	46.130	18.8%

ANALYST Juliana Kowalsky METHOD: 135 C FOR 2 HOURS IN OVEN.

DATE 3/25/96 BALANCE ID:_____ OVEN ID:_____

STUDY NUMBER: V-11278
CHEMICAL: V-53482 WP
CROP/PART: Soil
EXTRACTION REF: 11278-013

DISH NUMBER	SAMPLE NUMBER	GROSS WEIGHT	TARE WEIGHT	SAMPLE WEIGHT	GR. DRY WEIGHT	% MOISTURE
28	9U-1	8.580	2.260	6.320	7.580	15.8%
11	9U-2	8.920	2.250	6.670	7.740	17.7%
17	9X-1	9.110	2.240	6.870	8.140	14.1%
14	9X-2	9.040	2.240	6.800	7.780	18.5%
23	9X-3	8.420	2.260	6.160	7.180	20.1%
25	9Y-1	8.350	2.220	6.130	7.440	14.8%
10	9Y-2	9.38	2.24	7.140	8.04	18.8%
26	9Y-3	8.450	2.240	6.210	7.230	19.6%
2	9Z-1	8.480	2.220	6.260	7.450	16.5%
5	9Z-2	8.110	1.560	6.550	6.840	19.4%
6	9Z-3	7.940	1.570	6.370	6.620	20.7%

ANALYST Juliana Kowalsky
DATE 4/4/96

METHOD: 135 C FOR 2 HOURS IN OVEN.
BALANCE ID: B-18 OVEN ID: OV1

25

STUDY NUMBER: V-11278
CHEMICAL: V-53482 WP
CROP/PART: Soil
EXTRACTION REF: 11278-014

DISH NUMBER	SAMPLE NUMBER	GROSS WEIGHT	TARE WEIGHT	SAMPLE WEIGHT	GR. DRY WEIGHT	% MOISTURE
4	10X-1	49.990	43.280	6.710	48.480	22.5%
7	10X-2	48.600	41.260	7.340	47.130	20.0%
5	10X-3	52.100	45.530	6.570	50.740	20.7%
18	10Y-1	47.540	40.930	6.610	46.110	21.6%
10	10Y-2	58.740	52.520	6.220	57.520	19.6%
6	10Y-3	54.350	47.290	7.060	52.900	20.5%
9	10Z-1	62.52	54.3	8.220	60.72	21.9%
1	10Z-2	53.740	46.630	7.110	52.330	19.8%
15	10Z-3	46.690	39.810	6.880	45.250	20.9%

ANALYST Juliann Kowalsky METHOD: 135 C FOR 2 HOURS IN OVEN.

DATE 4/3/96 BALANCE ID: B-18 OVEN ID: OV1

STUDY NUMBER: V-11278
CHEMICAL: V-53482 WP
CROP/PART: Soil
EXTRACTION REF: 11278-012

DISH NUMBER	SAMPLE NUMBER	GROSS WEIGHT	TARE WEIGHT	SAMPLE WEIGHT	GR. DRY WEIGHT	% MOISTURE
15	11U-2	8.360	1.570	6.790	7.060	19.1%
8	11X-1	8.270	1.560	6.710	7.070	17.9%
26	11X-2	8.180	1.530	6.650	6.860	19.8%
22	11X-3	8.560	1.590	6.970	7.100	20.9%
5	11Y-1	9.150	1.550	7.600	7.780	18.0%
17	11Y-2	8.510	1.570	6.940	7.080	20.6%
4	11Y-3	8.37	1.53	6.840	6.99	20.2%
21	11Z-1	9.080	1.580	7.500	7.740	17.9%
14	11Z-2	9.160	1.540	7.620	7.640	19.9%
2	11Z-3	9.100	1.540	7.560	7.490	21.3%

ANALYST Juliann Kowalsky METHOD: 135 C FOR 2 HOURS IN OVEN.

DATE 4/4/96 BALANCE ID: B-18 OVEN ID: OV1

STUDY NUMBER: V-11278
CHEMICAL: V-53482 WP
CROP/PART: Soil
EXTRACTION REF: 11278-015

DISH NUMBER	SAMPLE NUMBER	GROSS WEIGHT	TARE WEIGHT	SAMPLE WEIGHT	GR. DRY WEIGHT	% MOISTURE
23	13U-1	10.180	2.270	7.910	8.680	19.0%
14	13X-1	8.900	2.240	6.660	7.450	21.8%
17	13X-2	10.310	2.250	8.060	8.770	19.1%
11	13X-3	9.060	2.250	6.810	7.740	19.4%
28	13Y-1	9.420	2.260	7.160	7.920	20.9%
9	13Y-2	10.390	2.210	8.180	8.770	19.8%
10	13Y-3	9.09	2.24	6.850	7.76	19.4%
8	13Z-1	8.940	2.250	6.690	7.480	21.8%
24	13Z-2	9.310	2.220	7.090	7.910	19.7%
22	13Z-3	9.180	2.210	6.970	7.800	19.8%

ANALYST Juliana Kowalsky METHOD: 135 C FOR 2 HOURS IN OVEN.

DATE 4/11/96 BALANCE ID: B-18 OVEN ID: OV1

STUDY NUMBER: V-11278
CHEMICAL: V-53482 WP
CROP/PART: Soil
EXTRACTION REF: 11278-017,11278-018

DISH NUMBER	SAMPLE NUMBER	GROSS WEIGHT	TARE WEIGHT	SAMPLE WEIGHT	GR. DRY WEIGHT	% MOISTURE
28	14U-1	10.782	2.249	8.533	9.523	14.8%
11	14U-2	10.690	2.251	8.439	9.290	16.6%
10	14U-3	10.218	2.241	7.977	8.816	17.6%
30	14U-4	10.331	2.214	8.117	8.735	19.7%
29	14U-5	10.380	2.226	8.154	8.763	19.8%
1	14U-6	10.255	2.239	8.016	8.650	20.0%
27	14X-1	10.317	2.204	8.113	9.055	15.6%
18	14X-2	10.902	2.219	8.683	9.307	18.4%
19	14X-3	10.496	2.200	8.296	8.918	19.0%
20	14X-4	10.441	2.211	8.230	8.932	18.3%
3	14X-5	10.353	2.240	8.113	8.850	18.5%
21	14X-6	10.276	2.266	8.010	8.831	18.0%

ANALYST Juliana Kowalsky METHOD: 135 C FOR 2 HOURS IN OVEN.

DATE 8/8/96 BALANCE ID: B-18 OVEN ID: OV1

STUDY NUMBER: V-11278
CHEMICAL: V-53482 WP
CROP/PART: Soil
EXTRACTION REF: 11278-017,11278-018

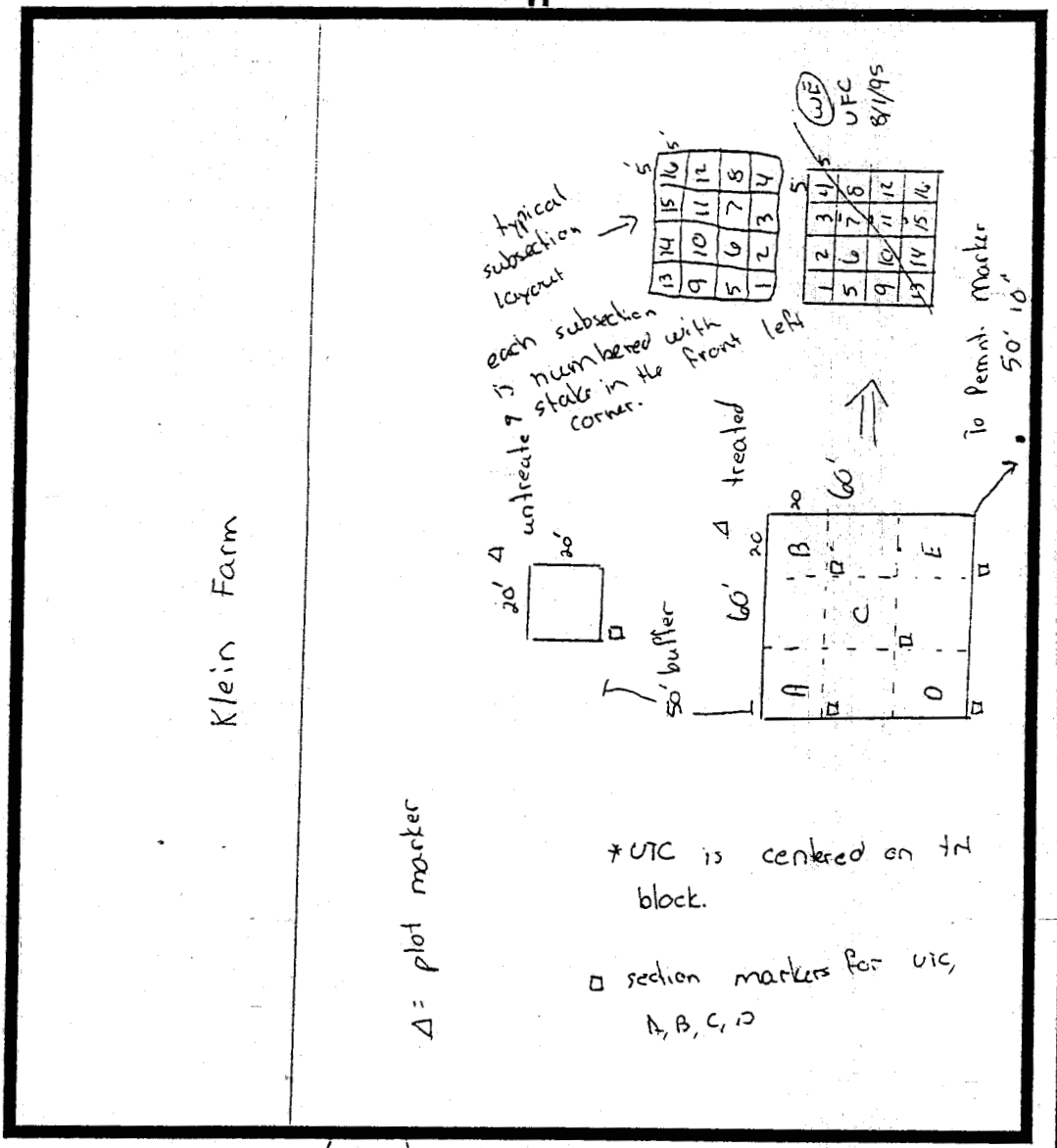
DISH NUMBER	SAMPLE NUMBER	GROSS WEIGHT	TARE WEIGHT	SAMPLE WEIGHT	GR. DRY WEIGHT	% MOISTURE
22	14Y-1	10.210	2.204	8.006	9.001	15.1%
9	14Y-2	10.333	2.211	8.122	8.875	18.0%
2	14Y-3	10.508	2.222	8.286	8.936	19.0%
17	14Y-4	10.200	2.240	7.960	8.721	18.6%
8	14Y-5	10.645	2.243	8.402	9.098	18.4%
24	14Y-6	10.245	2.214	8.031	8.736	18.8%
23	14Z-1	11.004	2.265	8.739	9.610	16.0%
14	14Z-2	10.279	2.233	8.046	8.789	18.5%
13	14Z-3	10.358	2.235	8.123	8.686	20.6%
12	14Z-4	10.429	2.236	8.193	8.853	19.2%
25	14Z-5	10.429	2.218	8.211	8.879	18.9%
26	14Z-6	10.502	2.240	8.262	8.936	19.0%

ANALYST Julian Kawlaky
DATE 8/8/96

METHOD: 135 C FOR 2 HOURS IN OVEN.
BALANCE ID: B-18 OVEN ID: OV1

VALENT TRIAL NUMBER: V-11278-A PROTOCOL NUMBER: V-95-11278
C.3 PLOT PLAN

NORTH



COMPLETED BY (SIGN): Frank Carey DATE: 8/1/95

VALENT TRIAL NUMBER: V-11278-A PROTOCOL NUMBER: V-95-11278
D.2 CROP AND PESTICIDE HISTORY

CROP HISTORY:

YEAR: 1994 CROP(S): none

YEAR: 1993 CROP(S): corn

YEAR: 1992 CROP(S): soybean

PESTICIDE HISTORY: (Applications prior to Study Director signature on protocol.)

CHEMICAL - FORMULATION	RATE[a] LBS ai/A	PESTICIDE TYPE	DATE OF APPL.
Lasso 4EC	2.5	herbicide	1993
Resource 0.86 EC	0.026	herbicide	1993
Laddock 3.32 EC	0.87	herbicide	1993
Freedom 3EC ~~3.3~~ WE UFC 8/19/96	3.375	herbicide	1992
Basagran 4L	0.75	herbicide	1992
Fusilade	0.188	herbicide	1992
		Frank Carey 8-A-96	

a. Specify other units, (eg. kg/ha), if necessary.

COMPLETED BY (SIGN): Frank Carey DATE: 8-19-96

VALENT TRIAL NUMBER: V-11278-A PROTOCOL NUMBER: V-95-11278

D.3 MAINTENANCE CHEMICALS

You will be provided with an Approved Pesticide List, (APL); the list of materials approved by the Study Director. Use approved pesticides only.

BRAND NAME	FORMULATION	RATE[a] ai/A	APPLIC. METHOD	PESTICIDE TYPE	DATE APPLIED	ENTRY DATE/ INIT.
Aatrex 90	90 WDG	2 lbs	broadcast	Herbicide	7-10-95	8-1 /UFC
Lasso	4 EC	3 lbs	broadcast	Herbicide	7-10-95	8-1 /UFC
Round-up	4 S	1 lb	broadcast	Herbicide	7-10-95	8-1 /UFC
Round-up	4S	1lb	broadcast	Herbicide	7-27-95	8-1 /UFC
Select	~~2~~ 2 EC	~~1.058~~ 0.05 lb	broadcast	Herbicide	7-27-95	8-1 /UFC
Round-up	4S	1-1b	broad cast	Herbicide	8-23-95	8-28/UFC
Round-up	4S	2 lb	broad cast	Herbicide	5-22-96	5-22/UFC
Round-up	4S	1.5 lb	broad cast	Herbicide	6-14-96	6-14/UFC
Round-up	4S	2 lb	broadcast	Herbicide	7-18-96	7-18/UFC
			from Carey 8-20-96			

a. Specify other units, (eg. kg/ha), if necessary.