SUMMARY

(In accordance with 40 CFR Part 152, this summary is available for public release after registration.)

STUDY TITLE

Updated Report: Field Volatility of Different 2,4-D Forms

DATA REQUIREMENTS

40CFR158 Subpart N
Guideline 835.8100

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STUDY COMPLETION DATE

20-Aug-2012

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STUDY NUMBER

120931

Updated Report: Field Volatility of Different 2,4-D Forms

SUMMARY

A field-scale volatility experiment was executed to measure and compare the vapor mass loss 2,4-D ethylhexyl ester (EHE), 2,4-D dimethylamine salt (DMA) and 2,4-D choline salt. Separate treatments of the three forms were made in 2010 and 2011 with commercial-scale spray equipment to plots in sites located in Indiana, Arkansas and Georgia. Off-plot air samplers collected airborne herbicide residues at successive intervals for up to 72 hours after treatment.

Indirect back-calculation methods were applied with the ISCST-3 air dispersion model to estimate the vapor fluxes of the three forms of 2,4-D with time from the measured air concentrations and logged meteorological observations. Additional algorithms, termed the "Better Back-Calculation Method" were applied to the results to allow optimal calculation of hourly mass fluxes for each treatment.

The majority of 2,4-D mass loss occurred within 12 hours following application from all the treated plots. In 2010 trials, over the course of 65 hours of sampling, the calculated loss of the EHE form of 2,4-D were 1.55% of applied from bare soil and 2.19% from soybean foliage. For the DMA salt, 0.62% and 1.58% was lost from bare soil and foliage respectively, while corresponding losses of the choline salt were 0.2% and 0.3% of applied. In 2011 treatments, over 72 hours of sampling, estimated losses from soybean and cotton crop canopies were similar. Ester losses averaged 5.5% of applied, while DMA and choline salt losses averaged 1.32% and 0.096% respectively. On average, these results translate to a greater than 94% reduction of volatile loss of the choline salt compared to the ester and an 86% reduction versus the DMA salt form.

The resulting fluxes were used to parameterize preliminary modeling of representative commercial-size fields. Based upon greenhouse plant injury endpoints, estimated 6-hour 2,4-D doses resulting from the salt forms of 2,4-D are likely below plant injury thresholds, while ester simulations indicate a possibility of visible effects. This report is an error correction update that supersedes study number 101712 (EPA MRID 48862902).

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STATEMENT OF NO DATA CONFIDENTIALITY CLAIMS

Compound: 2,4-D, glyphosate

Title: Updated Report: Field Volatility of Different 2,4-D Forms

No claim of confidentiality, on any basis whatsoever, is made for any information contained in this document. I acknowledge that information not designated as within the scope of FIFRA sec. 10 (d)(1)(A), (B), or (C) and which pertains to a registered or previously registered pesticide is not entitled to confidential treatment and may be released to the public, subject to the provisions regarding disclosure to multinational entities under FIFRA sec. 10(g).

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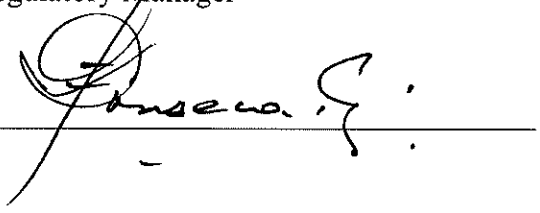
Signature: 

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THIS DATA MAY BE CONSIDERED CONFIDENTIAL IN COUNTRIES OUTSIDE THE UNITED STATES.

STATEMENT OF COMPLIANCE WITH GOOD LABORATORY PRACTICE STANDARDS

Title: Updated Report: Field Volatility of Different 2,4-D Forms

This report represents data generated after the effective date of the EPA FIFRA Good Laboratory Practice Standards.

United States Environmental Protection Agency
Title 40 Code of Federal Regulations Part 160
FEDERAL REGISTER, August 17, 1989
Organisation for Economic Co-Operation and Development
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This study does not meet requirements of 40 CFR Part 160.

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Non-GLP Study

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1. SUMMARY

A field-scale volatility experiment was executed to measure and compare the vapor mass loss 2,4-D ethylhexyl ester (EHE), 2,4-D dimethylamine salt (DMA salt) and 2,4-D choline salt. Separate treatments of the three forms were made in 2010 with commercial-scale spray equipment to three plots in sites located in Fowler and Farmland, Indiana. Plots in Fowler were tilled bare soil while the plots in Farmland contained mature soybean plants. 2011 experiments included four treatments, adding a 2,4-D choline plus glyphosate experimental formulation to the treatment list, with all treatments being made to plant canopies. Off-plot air samplers, placed at the eight cardinal and ordinal points around the plots at 5 and 15 meters from the plot edges, collected airborne herbicide residues at successive intervals for up to 72 hours after treatment.

Back-calculation methods were applied to the ISCST-3 air dispersion model to estimate the vapor fluxes of the three forms of 2,4-D with time from the measured air concentrations and logged meteorological observations. Additional algorithms, termed the "Better Back-Calculation Method" were applied to the results to allow optimal calculation of hourly mass fluxes for each treatment.

The majority of 2,4-D mass loss occurred within 12 hours following application from all the treated plots. In 2010 trials, over the course of 65 hours of sampling, the calculated loss of the EHE form of 2,4-D were 1.55% of applied from bare soil and 2.19% from soybean foliage. For the DMA salt, 0.62% and 1.58% was lost from bare soil and foliage respectively, while corresponding losses of the choline salt were 0.2% and 0.3% of applied. In 2011 treatments, over 72 hours of sampling, estimated losses from soybean and cotton crop canopies were similar. Ester losses averaged 5.5% of applied, while DMA and choline salt losses averaged 1.32% and 0.096% respectively. On average, these results translate to a greater than 94% reduction of volatile loss of the choline salt compared to the ester and an 86% reduction versus the DMA salt form.

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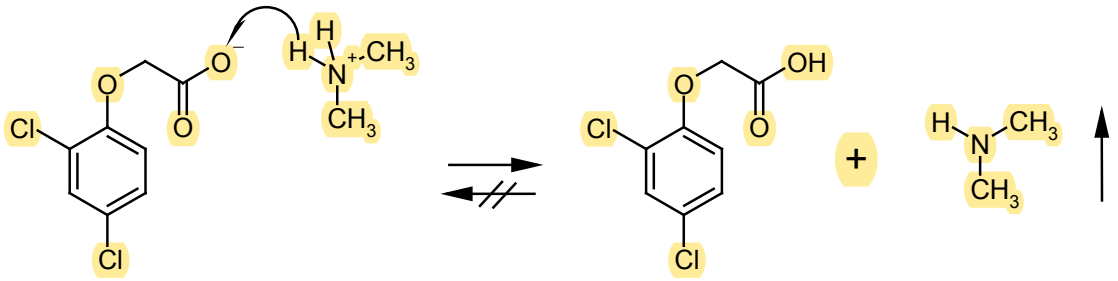
2. INTRODUCTION

The off-target movement of crop protection products via various mechanisms has been on ongoing stewardship challenge for agriculture as a whole for multiple decades (1, 2). Visible movement of materials through spray drift or runoff transport can be detected relatively easily and appropriate mitigation measures implemented. However, the movement in the vapor phase is invisible to the naked eye and may only manifest itself in longer-term and subtle off-target effects.

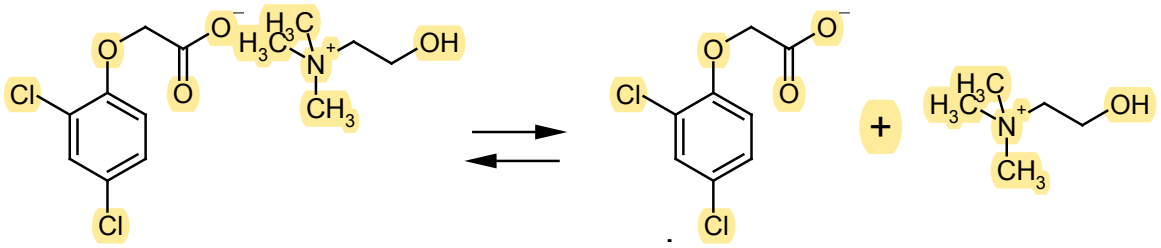
In the case of phenoxy herbicides, such as 2,4-D (2,4-dichlorophenoxy acetic acid) and other herbicides with auxinic modes of action, visible damage symptoms can appear in sensitive plants within days and at very small amounts of exposure (3, 4). Many of the damage reports and research with 2,4-D specifically were carried out in the 1950s to 1970s, primarily with the various short side-chain ester forms of the herbicide (5), where vapor losses could be quite high. More modern, amine salt forms of 2,4-D have greatly reduced volatility potential.

Although generally non-volatile, different salt forms of acid herbicides can exhibit drastically different volatility behavior. In the development of the choline salt of 2,4-D in support of the Enlist[1] Weed Control System, extensive research was carried quantify and characterize the volatility of various 2,4-D salts (6). The work indicated that the differences in potential volatility were not related to the inherent vapor pressure of the pure compound itself, but rather to the acid-base chemistry in force in solution and/or on surfaces. For the commercial standard DMA salt the following mechanism for volatile loss was postulated:

[1] Trademark of Dow AgroSciences LLC



The salt complex (left side of the chemical equation) was found to be relatively thermally unstable, due the protonation of the 2,4-D anion. The results in the formation of the uncharged dimethylamine, which can readily volatilize (Pv >10 mPa), essential driving the equation to the right and resulting in the formation of the 2,4-D acid itself (which has a Pv of about 0.02 mPa) which can also volatilize. In the case of the choline salt, the following mechanism applies:



Protonation of the acid does not occur and thus 2,4-D acid does not form; equilibrium is maintained between the salt complex and the 2,4-D anion, which has very low potential for volatile loss. These results led to the further development of herbicide formulations containing 2,4-D choline salt, such as the ones tested in the field in the current field study. As a 'positive control', as current commercial standard ester form of 2,4-D (the EHE) was included in the study design. Pure 2,4-D EHE has a vapor pressure of about 0.48 mPa and thus should exhibit much higher vapor loss than either of the salt forms tested.

3. MATERIALS AND METHODS

3.1. Field study design

A total of four separate experimental sites were established in 2010 and 2011, two per year. For 2010 studies plots were used at the Dow AgroSciences Midwest Field Experiment Station near

Fowler, IN and at the Purdue University Davis Experimental Farm, near Farmland, IN. 2011 experiments were conducted at privately-owned sites near Little Rock, Arkansas and Ty Ty, Georgia.

Three and four treatments plots were established at each site in 2010 and 2011, respectively. The Fowler site was recently-tilled bare soil, while the Farmland plots were established in subsections of three distinct soybean fields. The soybeans were approximately 30 cm high, with roughly 80% canopy closure. In Arkansas, application was also to growing soybeans, although at an earlier growth stage than at Farmland; the plants were 12-15 cm tall and canopy cover was about 15%. In Georgia, applications were made to cotton plants approximately 50 cm tall, with an estimated crop canopy of 40%.

The plots were different sizes and received different application rates to allow for efficient detection of the volatilized material, keeping in mind the relative vapor pressures and greenhouse volatility observations for the different applied forms of 2,4-D. Plots were roughly square. The plot sizes and rates applied are shown in Table 1 and Table 2, for 2010 and 2011, respectively.

Table 1 – 2010 Treatment list

Site	Treatment	Plot size (ha)	Application rate (kg 2,4-D ae/ha)
Farmland, IN	1 – 2,4-D choline (GF-2654)	2.35	4.48
	2 -2,4-D DMA	2.35	2.24
	3- 2,4-D EHE	0.25	1.12
Fowler, IN	1-2,4-D choline (GF-2654)	1.73	5.64
	2-2,4-D DMA	1.72	2.94
	3-2,4-D EHE	0.25	1.12

Table 2 – 2011 Treatment list

Site	Treatment	Plot size (ha)	Application rate (kg 2,4-D ae/ha)
Little Rock, AR	1-2,4-D choline (GF-2654)	2.2	4.48

	2 – 2,4-D choline + glyphosate DMA (GF-2726)	2.23	9.19
	3 – 2,4-d DMA	2.20	0.46
	4 – 2,4-D EHE	0.24	0.46
TyTy, Georgia	1 -2,4-D choline + glyphosate DMA (GF-2726)	2.22	8.85
	2 – 2,4-D choline (GF-2654	2.22	4.48
	3 – 2,4-D DMA	2.22	0.46
	4 – 2,4-D EHE	0.26	0.46

Air samplers were placed in a wheel and spoke design at 5 and 15 meters from each treated field edge (Figure 1; A= inner receptor ring; B outer receptor ring). At the eight cardinal and ordinal points of each plot, low-volume air sampling pumps (SKC model numbers 224-44XR, 224-PCXR8 and 224-52) were mounted on posts, 16 samplers per plot in total. Samplers were positioned at height of 30 cm at Fowler, 50 cm at Farmland (roughly level with the top of the soybean canopy), 15 cm in Arkansas (at soybean canopy height), and 50 cm in Georgia (at cotton canopy height). Locations of plot boundaries and samplers were logged with GPS coordinates, which were used in building the air dispersion modeling input files needed to indirectly estimate the transient flux from each plot. Aerial overviews of the four sites are shown in Figures 2- 5.

Figure 1 – Plot schematic

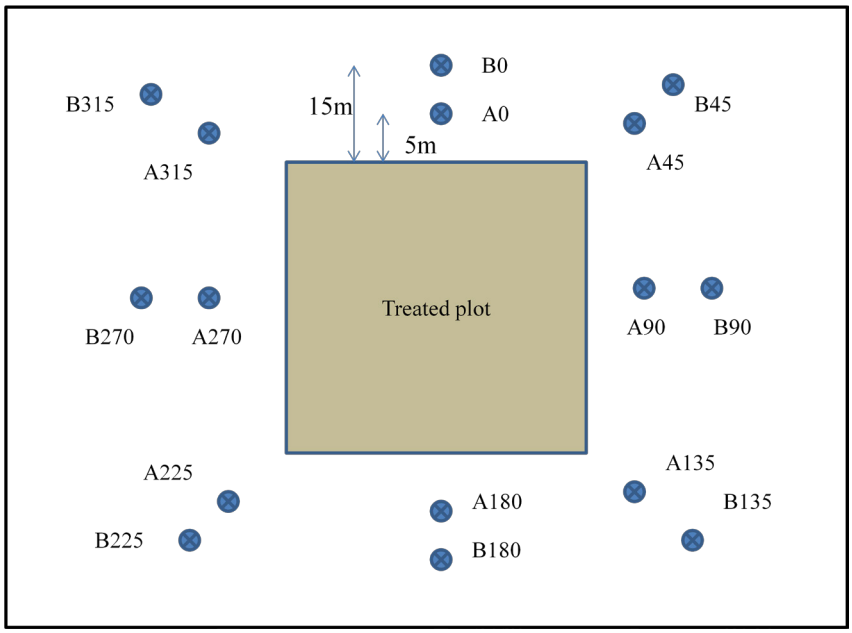


Figure 2 – overview, Farmland, IN site

Figure 3 – overview, Fowler, IN site

Figure 4 – overview, Arkansas site

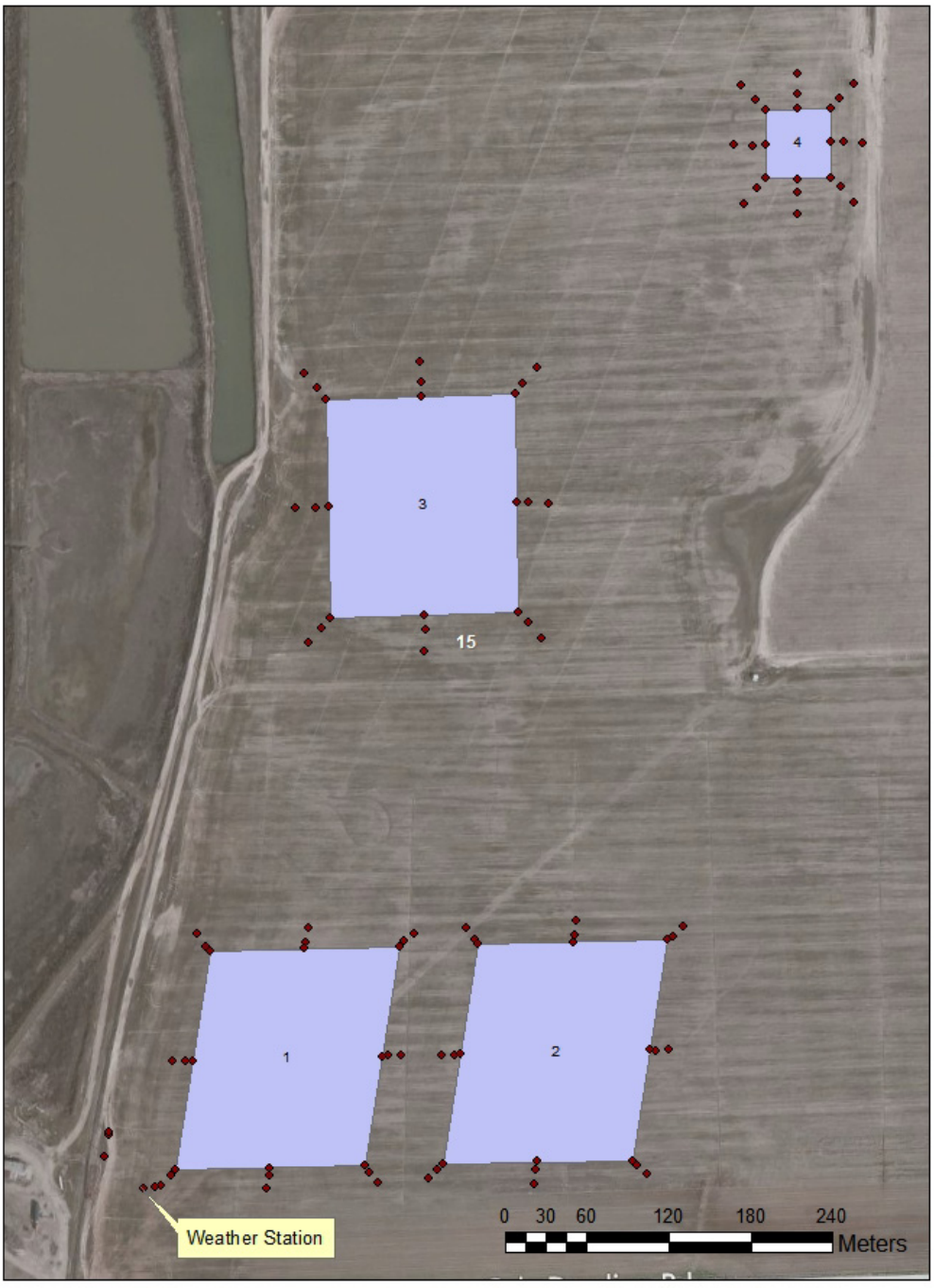
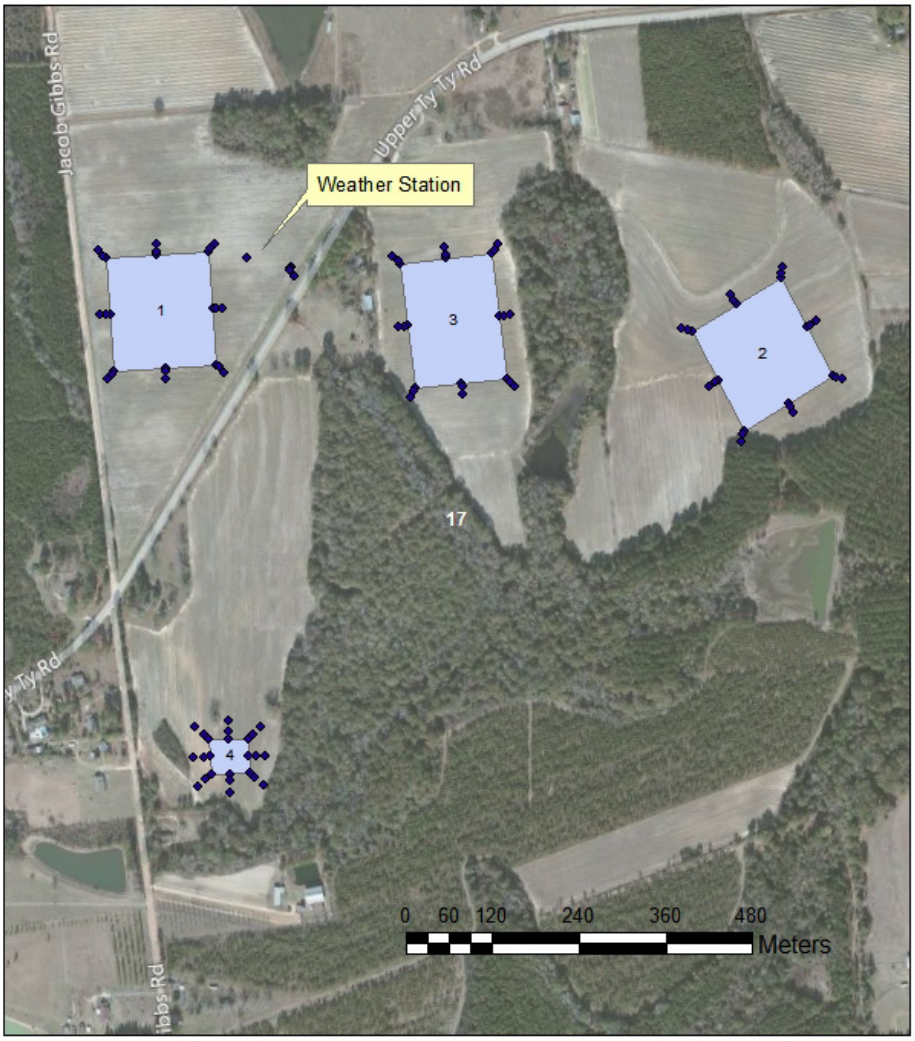


Figure 5 – overview, Georgia site



3.1.1. Soil characterization

Based upon soil survey information (7, the soil phases contained in the plots are shown Table 3 and Table 4, for the 2010 and 2011 sites, respectively.

Table 3 – soil survey information – 2010 sites

Site and treatment	Map Unit name	Percent of area
Farmland – plot 1	Blount silt loam, 0 to 1 percent slopes	54%
	Pewamo silty clay loam	46%
Farmland – plot 2	Blount silt loam, 0 to 1 percent slopes	20%

	Glynwood silt loam, 1 to 4 percent slopes, eroded	33%
	Pewamo silty clay loam	47%
Farmland – plot 3	Blount silt loam, 0 to 1 percent slopes	31%
	Pewamo silty clay loam	69%
Fowler – plot 1	Drummer silty clay loam, stratified sandy substratum	57%
	Foresman silt loam, till substratum, 1 to 5 percent slopes, eroded	18%
	Warners variant silty clay, undrained	21%
	Whitaker silt loam, 0 to 3 percent slopes	3%
Fowler – plot 2	Darroch silt loam, till substratum	1%
	Drummer silty clay loam, stratified sandy substratum	94%
	Warners variant silty clay, undrained	5%
Fowler – plot 3	Blount silt loam, 0 to 1 percent slopes	31%
	Pewamo silty clay loam	69%

Table 4 – soil survey information – 2011 sites

Site and treatment	Map Unit name	Percent of area
Little Rock – plot 1	Hebert silt loam, 0 to 1 percent slopes	100%
Little Rock – plot 2	Hebert silt loam, 0 to 1 percent slopes	100%
Little Rock – plot 3	Hebert silt loam, 0 to 1 percent slopes	100%
Little Rock – plot 4	Hebert silt loam, 0 to 1 percent slopes	100%
Ty Ty – plot 1	Dothan loamy sand, 2 to 5 percent slopes	100%
Ty Ty – plot 2	Tifton loamy sand, 2 to 5 percent slopes	100%
Ty Ty – plot 3	Tifton loamy sand, 2 to 5 percent slopes	100%
Ty Ty – plot 4	Ardilla loamy sand	5%
	Tifton loamy sand, 2 to 5 percent slopes	95%

3.1.2. Test material

The following formulations were used:

2,4-D EHE – Weedone LV4 EC (Nufarm or commercial equivalent)

2,4-D DMA – Weedar 64 (Nufarm, or commercial equivalent)

2,4-D choline salt (stand-alone) – GF-2654 (Dow AgroSciences experimental formulation)

2,4-D choline salt + glyphosate DMA – GF-2726 (Dow AgroSciences experimental formulation) (used only at the GA and AR locations)

3.1.3. Application details

Farmland

Applied with AGCO 4000 Series Spra-Coupe @ 6.7 MPH, 75 ft boom, 20 gpa with AIXR 11004 nozzles @ 50 psi (very coarse droplets). Application times are shown in Table 5

Table 5 – Farmland, IN application times – all applications on 7-August-2010

Treatment	Formulation	Start time	Stop time
1	GF-2654	0930	0945
2	2,4-D DMA	1000	1015
3	2,4-D EHE	1035	1045

Fowler

Applied with two custom-built research sprayers @ 4.6-5.6 MPH, 15-20 ft booms, 10 gpa with AI11002 and AI110015 nozzles @ 32-38 psi (very coarse droplets). Application times are shown in Table 6

Table 6 – Fowler, IN application times – all applications on 10-September-2010

Treatment	Formulation	Start time	Stop time
1	GF-2654	0835	0925
2	2,4-D DMA	1007	1044
3	2,4-D EHE	0854	0904

Arkansas

Tractor mounted 3-point hitch sprayer, 60 gallon cone sprayer with hydraulic driven roller pump, calibrated to deliver 10 gallons per acre, application speed of 7 mph, spray width of 20 feet with AITTJ110-025 nozzles with 50 mesh screens @37 psi 20-24 inches above crop canopy. Application times are shown in Table 7.

Table 7 – Arkansas application times – all application on 12- July-2011

Treatment	Formulation	Start time	End time
1	GF-2654	0638	0725
2	GF-2726	0750	0830
3	2,4-D DMA	0850	0920
4	2,4-D EHE	0940	0955

Georgia

John Deere HiBoy sprayer (GF-2726 and GF-2654) and tractor mounted 3-point hitch sprayer (2,4-D DMA and 2,4-D EHE). Both calibrated to deliver 17 gallons per acre, application speed of 4.25 mph, with Greenleaf Air Mix 11025 nozzles @39 psi with 50 mesh screens. Application times are shown in Table 8

Table 8 - Georgia application times – all application on 16-Aug-2011

Treatment	Formulation	Start time	End time
1	GF-2726	0730	0750
2	GF-2654	0852	0912
3	2,4-D DMA	0733	0803
4	2,4-D EHE	0858	0904

3.1.4. Air sampling

2,4-D was monitored using XAD-2 (SKC Inc. Catalog No. 226-58) OSHA Versatile Sample (OVS) vapor collection tubes. Each tube contains a front and back section of XAD-2 (270/140 mg) sorbent. The air flow through the tube was calibrated at the beginning of each sample period to approximately1 L per minute.

The vapor collection tubes were covered to protect them from sunlight. At the end of each sample period, the sample flow was checked, recorded, and the sample tube labeled. The tube was removed, capped and placed in frozen storage as soon as practical. Each sample event was documented with the beginning and ending flow rates, beginning and ending times, and any anomalous events.

3.1.5. Meteorological monitoring and post-processing for air dispersion modeling

Weather conditions were collected with automated weather stations installed at each study site. Data on wind speed and direction, air temperature, barometric pressure, solar radiation and precipitation were collected at one-minute intervals.

Post-processing steps were required to convert the data to the form required for input into ISCST-3 (9). Because the model operates on an hourly time-step, hourly averages were formulated. Wind velocities were devolved into their vector components for averaging and temperatures simply averaged. Note that ISCST requires wind directions in the "blowing to" direction, rather than the standard "blowing from" direction, so all directions were shifted 180°.

The model also requires input of an atmospheric stability class based on Pasquill stability classes (8, cited in 9), which is a function of wind speed, solar radiation and cloud cover. Classes range from A (extremely unstable) to G (extremely stable). Sunset and sunrise times and cloud cover information for each site was extracted from NOAA National Climate Data Center records for the nearest hourly surface conditions station. Lookup values shown in Table 9 were assembled to assign a class to each hourly weather record.

Table 9 – Atmospheric stability lookups

Wind speed (m/s)	Daytime[a] insolation (w/m^2)				Nighttime cloud cover[b]	
	>925	925-675	675-175	<175	>50%	<50%
<2	A	A	B	D	E	F
2-3	A	B	C	D	E	F
3-5	B	B	C	D	D	E
5-6	C	C	D	D	D	D
>6	C	D	D	D	D	D

[a] Daytime is from 1 hour after sunrise to 1 hour before sunset
[b] >50% cover: BKN (broken clouds); < 50% cover: FEW (few clouds), SCT (scattered clouds), CLR (clear); Class D (neutral stability) used for OVR (overcast) conditions day or night

3.1.6. Plant bioassays

For the Fowler location in 2010, potted cotton and grape plants were reared in the DAS greenhouse, transported to the field location and placed in and around treated areas after applications were made (~1 hr after application, so any injury observations would be related to vapor transport and not spray drift). Plastic liners were used to separate the pots from the treated soil. Three grape plants and two cotton plants were placed at each air sampling station and nine grape and six cotton plants were placed inside the treated area for each treatment. Plants were transported back to the DAS greenhouse facility after the full three day exposure period. All the plants were placed together in the same greenhouse, with the same water and care schedule. Visual plant responses were evaluated 27 days after the initial exposure (25 days after being transported back to greenhouse facility). The injury evaluated was epinasty and leaf malformation. Ratings were made comparing back to the untreated (unexposed) check using a 0-100% visual scale (0% no injury, 100% complete death).

3.2. Analysis of air samples

The analysis of the tube sample tubes was based upon methods developed by the Agricultural Handlers Exposure Task Force (AHETF), analytical method AHETF-AM-022, "Determination of 2,4-D in OVS Air Sampling Tubes by HPLC/MS/MS", with some modifications by Dow AgroSciences Analytical Sciences group (2010 samples) and Product Safety Labs (PSL, 2011 samples). It was determined that an SPE cleanup step was not required. The final methods are reproduced in Appendix A. The method limit of quantitation ranged from 1.25 to 5.0 ng 2,4-d per tube; limit of detection was approximately 0.75-1.5 ng/tube.

The analytical method involves removing the XAD-2 resin from the sampling tubes, extracting with 90:10 methanol:0.1 N sodium hydroxide and then analyzing via HPLC with tandem mass spectrometric detection. A stable isotope standard was used as an internal standard. The full analytical report from PSL is reproduced in Appendix D. A separate analytical report was not prepared for the 2010 analytical work performed by Dow AgroSciences' Analytical Sciences group.

3.3. Modeling of 2,4-D air transport

Since air concentrations were measured off-plot, an indirect calculation method to estimate the mass fluxes of herbicide being emitted from each treated plot was needed. This was implemented by the use of an air dispersion model which incorporated the on-site wind conditions and assumed area mass fluxes to predict off-plot air concentrations. Employing back calculation methods, the mass fluxes were refined to give a best-fit estimate of the real-world hourly mass fluxes from each plot.

3.3.1. Modeling methodology

There is a history of using Gaussian plume air dispersion models as screening tools to predict neighboring air concentrations surrounding a contamination source. Examples of Gaussian and "puff" models used to estimate air concentrations resulting from point or area sources include ISCST3 (9), CALPUFF (10) and AERMOD (11). A "source" is defined as an agricultural field or surrounding area that emits a volatile organic compound (VOC) at some prescribed steady or transient flux rate. These dispersion tools were initially designed for modeling of smoke stack emissions, but have successfully been applied to agricultural settings (12, 13). For this work, the ISCST-3 model was parameterized with the location of each sites plot as area sources, as well as the air monitoring locations as receptors.

3.3.2. Back-calculation of flux

The first level of back-calculation was based upon the methods of Ross, et al. (14) and considered each source independently and assumed a constant flux over each sampling period. Simple linear regressions at each sampling time were employed to iteratively refine the flux values. A more robust method of optimizing the hourly flux values, termed the "Better Back-Calculation Method" ("BBCM"; 15) was also applied. The BBCM expands the Ross et al. method by using a downhill simplex optimization procedure to consecutively adjust the volatility flux rates through multiple dispersion model iterations such that the sum of the squared residuals between predicted and measured air concentrations is minimized. The procedure also allows the examination of the influence of other nearby sources upon the resulting air concentrations.

Details of the BBCM method, which was developed using, in part, the data from the 2010 trials in this study, is in Cryer, et al. (15).

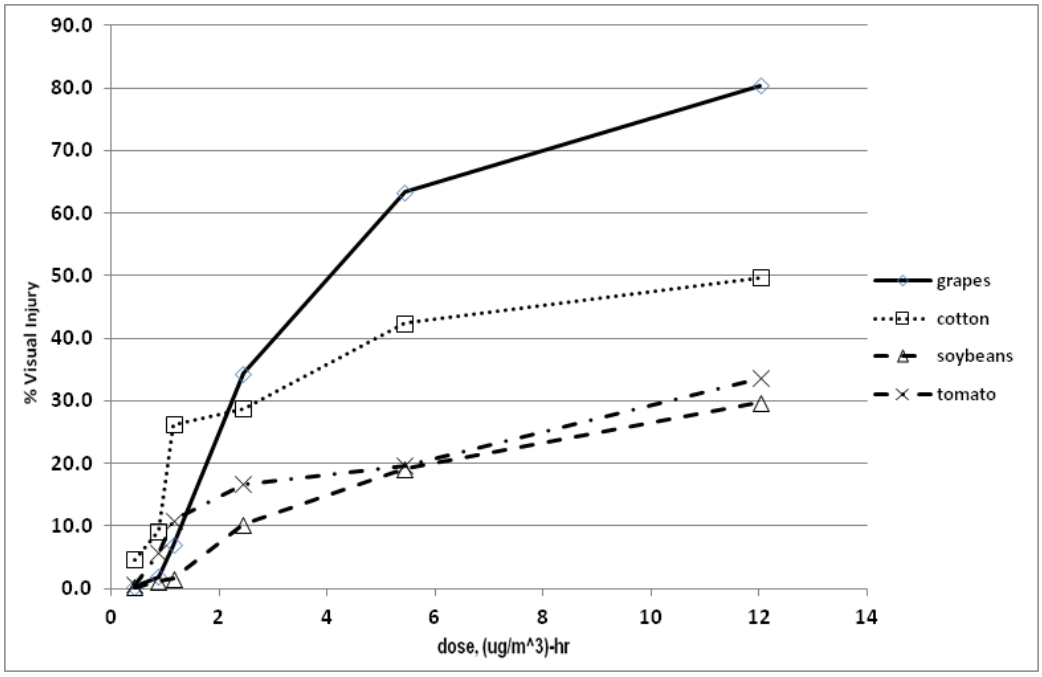
3.3.3. Extrapolation

Once fluxes were estimated using an indirect back-calculation approach, it was then possible to model potential air concentration profiles from theoretical full field-scale applications. Several cases of field size and weather conditions were modeled to yield results that could be useful for risk assessment and/or product stewardship contexts.

Merely calculating off-target concentrations does not, however, give a full view of the potential for non-target plant effects. These effects are highly dependent upon the duration of exposure at a concentration; in other words, an actual mass dose. Even though this is relatively straight-forward to compute (it is the area under a concentration by time curve), relating even this to a plant response is highly dependent upon plant species, growth stage, plant stress level, and other factors. Previous literature has been sparse in this area and tended not to include analytical measurement of air concentrations nor to include exposure time as a variable (e.g., 16) Recent work by Ouse, et al. with 2,4-D acid in enclosed greenhouse systems (17) included detailed analytical measurements using constant flows of 2,4-D acid at a fixed air concentration for up to eight hours and followed by observing the effects upon small potted grape, cotton, soybean and tomato plants (injury ratings were taken 7 and 14 days after exposure). A plot of dose of dose in ($\mu g/m^3$)-hr vs. visual injury is shown in Figure 6. It is clear that these relationships vary widely and are not linear. From this single experiment, if is difficult to make sweeping conclusions on dose-response, however, a "c x t" dose of about 1-1.5 $\mu g/m^3$-hr yielded a visual injury of about 10% across the three of the four species, with soybeans showing markedly lower sensitivity. It appears (for example for cotton) that at higher doses, the slope of injury vs. dose is much shallower than at lower doses. These findings are in contrast to the conclusions of Breeze, 1990 (18) who showed a linear relationship of concentration with uptake of ^{14}C-labeled 2,4-D butyl ester(plant injury was not evaluated), although those experiments were carried out for a fixed exposure period. However, the Ouse, et al. data does indicate generally that grapes are likely to more sensitive (i.e., to exhibit higher levels of visual injury) to 2,4-D vapor exposure than

tomato, soybean or cotton, above a threshold dose of about 2 μg/m^3-hr. The work of Ouse et al. is preliminary in nature but does provide qualitative comparisons for the potential of 2,4-D impact between different plant species. More detailed and refined effects experiments are, at this writing, in progress or under development (D. Ouse, personal communication, June 2012).

Figure 6 – 2,4-D acid dose vs. exposure times for greenhouse plants (17)



4. RESULTS AND DISCUSSION

4.1. Weather conditions

Meteorological input files for ISCST-3 are reproduced in Appendix B, with a summary of conditions in Table 10.

Table 10 – Summary weather conditions

Site	Date range	Temperature range, °C (°F)	Wind speed, m/s	Relative humidity, %
Farmland, IN	7-aug-2010 – 9-aug-2010	13.8 -32.6 (56.9 – 90.6)	0.1 – 3.3	45 -100
Fowler, IN	10-sep-2010 - 12-sep-2010	9.2 - 28.7 (48.6 – 83.7)	0.3 – 7.9	26 - 98
Little Rock, AR	12-july-2011	24.5 – 38.4	0.5 - 5	35 - 96

	- 15-july-2011	(76.1 – 101.2)		
Ty Ty, GA	16-aug-2011 - 19-aug-2011	18.8 – 35.9 (65.6 – 96.7)	0.2 – 3.3	24 - 98

4.2. 2,4-D air concentrations

The complete analytical results for all samples are contained in Appendix C (2010 results) and Appendix D (2011 results). Maximum, minimum, and average concentrations by site and treatment are shown in Table 11. The maximum column includes the receptor location where the maxima were observed; means are across all receptors for the corresponding sampling period.

Table 11 – Observed concentration ranges – Farmland, IN, site

Treatment	Period	Hours after treatment	Concentrations, µg/m^3		
			Minimum	Maximum (sampling position)	Mean
1 – 2,4-D choline	1	3	0	0.563 (A0)	0.139
	2	9	0	0.005 (A270)	0.001
	3	15	0	0.001 (A0)	0.000
	4	21	0	0.001 (B45)	0.000
	5	34	0	0.018 (A315)	0.004
	6	45	0.0005	0.005 (A270)	0.002
	7	58	0	0.024 (A315)	0.004
	8	69	0.0006	0.005 (A0)	0.002
2 - 2,4-D DMA	1	3	0	0.916 (A270)	0.099
	2	9	0	0.033 (A315)	0.009
	3	15	0	0.022 (A270)	0.005
	4	21	0	0.006 (A45)	0.002
	5	34	0	0.026 (A270)	0.005
	6	45	0.0007	0.006 (A270)	0.003
	7	58	0.0004	0.014 (A315)	0.003
	8	69	0.0004	0.008 (A270)	0.003
3 – 2,4-D EHE	1	2	0	0.785 (A270)	0.165
	2	8	0.002	0.437 (A270)	0.111
	3	14	0	0.270 (A270)	0.063
	4	20	0	0.190 (A270)	0.039
	5	33	0.0003	0.344 (A270)	0.070
	6	44	0.001	0.163 (A270)	0.026
	7	57	0.001	0.162 (A270)	0.035
	8	68	0.002	0.078 (A270)	0.019

Table 12 – Observed concentration ranges – Fowler, IN, site

Treatment	Period	Hours after treatment	Concentrations, µg/m^3		
			Minimum	Maximum	Mean
1 – 2,4-D	1	5	0	0.9214 (A270)	0.0838

choline	2	11	0.001	0.0107 (B270)	0.0035
	3	17	0	0.0215 (A270)	0.0022
	4	23	0	0.0885 (B270)	0.0152
	5	34	0	0.0036 (A270)	0.0006
	6	47	0	0.0062 (A270)	0.0005
	7	59	0	0.0031 (B270)	0.0004
	8	70	0	0.0010 (B270)	0.0002
2 - 2,4-D DMA	1	3	0	1.3942 (A270)	0.1483
	2	9	0.0007	0.0422 (A270)	0.0097
	3	15	0	0.0060 (A270)	0.0017
	4	21	0.0013	0.1138 (A270)	0.0226
	5	33	0	0.0067 (B270)	0.0011
	6	45	0	0.0034 (B270)	0.0005
	7	57	0	0.0071 (A270)	0.0009
	8	69	0	0.0003 (A270)	0.0001
3 – 2,4-D EHE	1	5	0	0.1532 (A270)	0.0243
	2	11	0.0006	0.0351 (A270)	0.0083
	3	17	0.0000	0.0162 (A270)	0.0026
	4	23	0.0007	0.0491 (A270)	0.0100
	5	35	0.0005	0.0460 (A90)	0.0175
	6	47	0.0002	0.0279 (A90)	0.0060
	7	59	0.0004	0.0143 (A90)	0.0044
	8	71	0	0.0036 (A0)	0.0012

Table 13 – Observed concentration ranges – Little Rock, AR, site

Treatment	Period	Hours after treatment	Concentrations, µg/m^3		
			Minimum	Maximum	Mean
1 – 2,4-D choline	1	5	0.001	1.717 (A0)	0.160
	2	10	0.002	0.023 (A135)	0.009
	3	16	0.001	0.016 (A315)	0.006
	4	23	0.001	0.011 (A0)	0.004
	5	36	0.001	0.179 (A135)	0.031
	6	47	0.001	0.009 (A135)	0.003
	7	60	0.001	0.003 (A135)	0.002
	8	71	0.001	0.004 (A180)	0.002
2 - 2,4-D choline + glyphosate DMA	1	3	0.001	0.483 (A0)	0.111
	2	9	0.002	0.051 (A45)	0.016
	3	15	0.002	0.030 (A0)	0.011
	4	22	0.001	0.024 (A0)	0.008
	5	35	0.002	0.159 (A135)	0.031
	6	46	0.001	0.005 (A90)	0.003
	7	58	0.001	0.015 (A45)	0.004
	8	69	0.001	0.008 (A45)	0.003
3 - 2,4-D DMA	1	3	0.002	0.423 (A45)	0.081
	2	9	0.001	0.040 (A90)	0.010
	3	15	0.002	0.016 (A0)	0.006
	4	21	0.002	0.008 (A0)	0.004
	5	34	0.001	0.074 (A180)	0.010
	6	45	0.001	0.007 (A180)	0.002
	7	58	0.001	0.004 (A90)	0.002

	8	69	0.001	0.002 (A180)	0.002
4 – 2,4-D EHE	1	2	0.003	0.206 (A90)	0.047
	2	8	0.001	0.116 (A0)	0.022
	3	14	0.002	0.070 (A0)	0.012
	4	20	0.001	0.069 (A0)	0.015
	5	34	0.002	0.107 (A135)	0.021
	6	44	0.001	0.073 (A270)	0.025
	7	57	0.001	0.011 (A180)	0.004
	8	68	0.001	0.013 (A180)	0.004

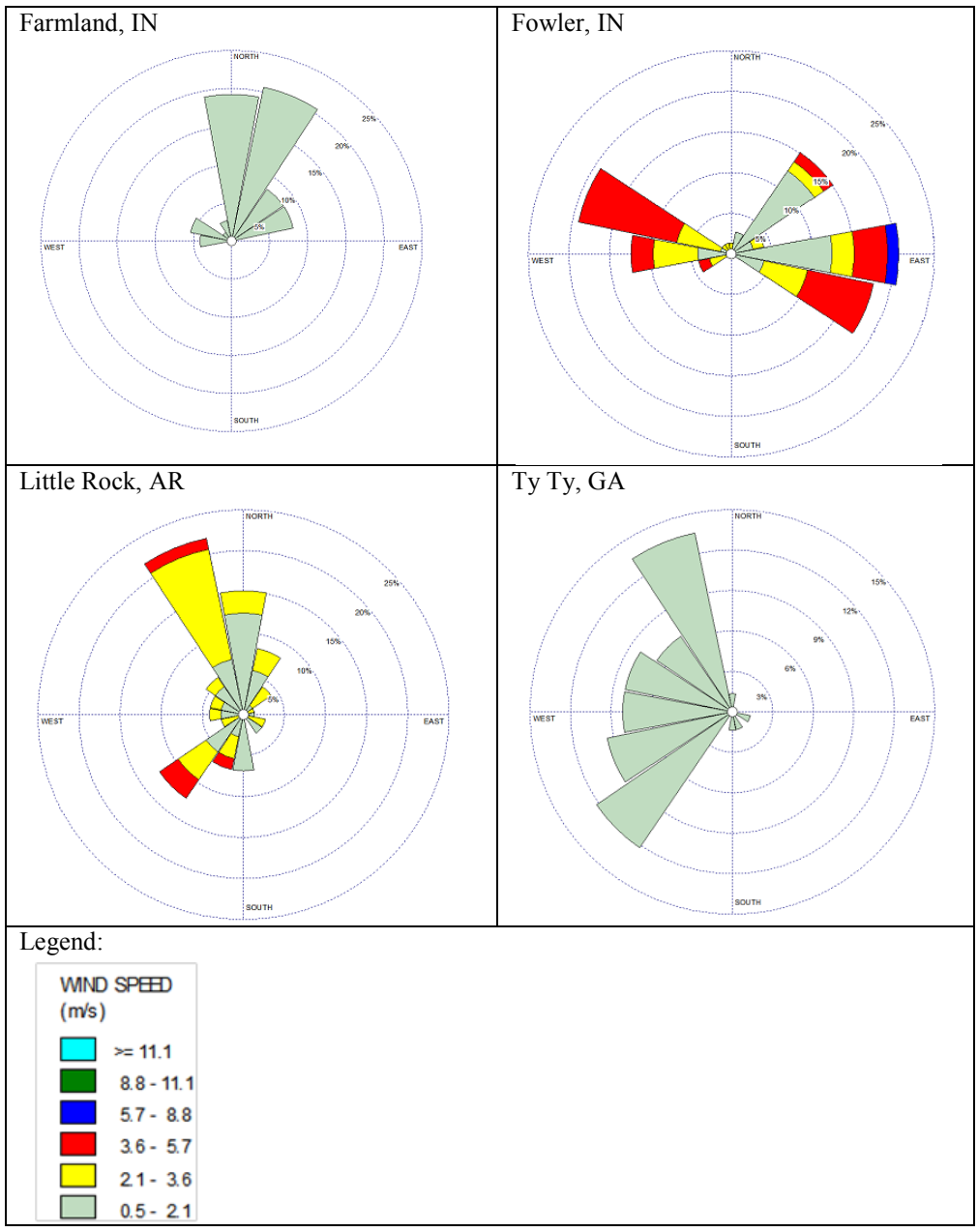
Table 14 – Observed concentration ranges – Ty Ty GA, site

Treatment	Period	Hours after treatment	Concentrations, µg/m^3		
			Minimum	Maximum	Mean
1 – 2,4-D choline	1	4	0.002	0.455 (A90)	0.123
	2	10	0.004	0.032 (A90)	0.014
	3	16	0.001	0.048 (A90)	0.015
	4	22	0.002	0.024 (A90)	0.009
	5	36	0.002	0.013 (A180)	0.005
	6	47	0.001	0.006 (A315)	0.003
	7	60	0.002	0.009 (A270)	0.004
	8	71	0.001	0.006 (A0)	0.003
2 - 2,4-D choline + glyphosate DMA	1	3	0.017	0.785 (A180)	0.158
	2	9	0.003	0.010 (A180)	0.005
	3	15	0.002	0.006 (A90)	0.004
	4	21	0.002	0.006 (A180)	0.003
	5	35	0.001	0.024 (A315)	0.005
	6	46	0.001	0.040 (A270)	0.005
	7	59	0.001	0.012 (A180)	0.004
	8	70	0.001	0.004 (A180)	0.002
3 - 2,4-D DMA	1	4	0.013	0.552 (A90)	0.176
	2	10	0.004	0.078 (A315)	0.024
	3	16	0.002	0.031 (A315)	0.010
	4	22	0.003	0.010 (A270)	0.005
	5	36	0.001	0.005 (A270)	0.002
	6	47	0.001	0.005 (A315)	0.002
	7	60	0.001	0.011 (A270)	0.003
	8	71	0.001	0.005 (B315)	0.002
4 – 2,4-D EHE	1	3	0.005	0.231 (A180)	0.042
	2	9	0.014	0.279 (A0)	0.097
	3	15	0.010	0.251 (A0)	0.079
	4	21	0.033	0.167 (A180)	0.083
	5	35	0.011	0.153 (A180)	0.049
	6	46	0.003	0.047 (A180)	0.015
	7	59	0.003	0.028 (A180)	0.008
	8	70	0.002	0.033 (A225)	0.009

In the 2010 experiments, fields in Farmland and Fowler were oriented roughly North-South, so the A0 receptor was at a bearing of approximately due North from the plot center. This was also

true at the Little Rock site; however, at the Ty Ty site, plot 2 was rotated about 45 degrees counter-clockwise from north, so the A45 receptors had an approximately northerly bearing. Wind roses for the entire sampling period were constructed for the four sites to possibly shed some light on the directions of the maximum concentrations noted above. Overall wind roses are shown in Figure 7 (note that these wind roses plot the "blowing toward" directions). At Farmland, maximum concentrations were primarily in the northwestern quadrant of receptors, which encompassed a significant portion of the wind rose; this was also strongly true for Fowler, where many of the maxima occurred at the 270° position. At Little Rock, results were much more variable; in fact, many of the highest air concentrations occurred at the 180° position, seeming opposite of the prevailing winds. This can also be observed for the Ty Ty site, although winds were quite light at that site and potentially more variable.

Figure 7 – Overall wind roses



The relatively close proximity of the treated plots could have resulted in some cross-contamination between receptors. For example, at the Georgia site, plots 2, 3 and 1 were in a nearly directly upwind to downwind line, based upon the wind rose. To account for this,

calculation of optimized hourly mass fluxes using the BBCM method included the contributions of all of the treated plots simultaneously (15).

4.3. Plant bioassay results

The visual plant responses from the Fowler location in 2010 indicate that for the GF-2654 (choline) and DMA formulation of 2,4-D, only the potted plants placed within the actual treatment area showed consistent visual injury (Table 15). For the 2,4-D ester treatment, both the plants inside the treated area and those in the downwind direction showed a visual injury response. The injury outside of the treated area was in the direction consistent with the prevailing wind during the study (Figure 7) and the relative amounts of injury between treatments were generally consistent with the flux loss results.

Table 15 – Plant bioassay results, Fowler, IN site

Receptor Location	% Visual Injury 27 Days after Treatment (avg across plants)					
	Grapes			Cotton		
	GF-2654	DMA	Ester	GF-2654	DMA	Ester
Inside Treated Area	0.6	1	13	40	40	60
A0	0	0	23	0	0	50
A45	0	0	0	0	0	45
A90	0	0	0	0	0	50
A135	0	0	0	0	0	40
A180	0	0	0	0	0	0
A225	0	0	0	0	0	0
A270	0	0	8	0	15	50
A315	0	0	15	0	1.5	50
B0	0	0	0	0	0.5	50

B45	0	0	0	0	0	7.5
B90	0	0	2	0	0	40
B135	0	0	0	0	0	2.5
B180	0	0	0	0	0	0
B225	0	0	0	0	0	0
B270	0	0	0	0	0	50
B315	0	0	1	0	0	35

4.4. Calculated fluxes

4.4.1. Single-plot back-calculations

Fluxes were back-calculated via iterative runs of ISCST-3. For the first run, fluxes were set to 1.E-9 g/m^2/s. The modeled values were then averaged at each receptor and sampling period and compared to the corresponding measured values. The ratio of predicted to measured value was calculated, and the mean of that ratio at each sampling period was used to scale the flux value for the next iteration of runs. Since there were many zeros in both the measured and modeled results, they were excluded from the calculation. In addition, the total root-mean-square (RMS) error for each sampling period was also calculated as a measure of potential convergence. Although actual linear regression was not performed, the method employed to minimize RMS error gave essentially the same result. Up to three iterations were performed for each treatment. The final fluxes obtained are shown in Tables 16 and 17 and intermediate values are shown in Appendix E..

Table 16 – Iterative single-plot final fluxes – 2010 trials

Farmland, IN			
	treatment		
Sample period	1 - 2,4-D choline	2- 2,4-D DMA	3 - 2,4-D EHE
1	2.80E-09	5.50E-08	6.85E-07
2	2.85E-10	1.00E-11	2.30E-07
3	2.50E-12	1.20E-09	6.30E-10
4	3.40E-11	4.80E-11	8.20E-10
5	5.00E-11	7.00E-10	2.20E-08
6	1.40E-10	2.60E-10	6.60E-09
7	2.10E-10	3.50E-10	1.30E-09
8	8.30E-11	4.00E-11	6.60E-11
Fowler, IN			
	treatment		
Sample period	1 - 2,4-D choline	2- 2,4-D DMA	3 - 2,4-D EHE
1	2.00E-08	5.50E-08	3.30E-08
2	2.00E-09	7.10E-09	9.60E-09
3	6.80E-11	1.70E-10	9.80E-10
4	4.30E-09	7.15E-09	8.70E-09
5	2.30E-10	2.10E-10	5.90E-09
6	4.60E-13	2.90E-13	2.40E-09
7	5.40E-12	1.75E-11	3.20E-09
8	2.80E-12	0	3.50E-11

Table 17 – Iterative single-plot final fluxes – 2011 trials

Little Rock, AR				
	treatment			
Sample period	1 - 2,4-D choline alone	2 - 2,4-D choline + glyphosate	3 - 2,4-D DMA	4 - 2,4-D EHE
1	4.50E-09	8.40E-08	5.90E-08	1.90E-08
2	2.80E-09	7.40E-09	6.00E-09	5.60E-08
3	3.40E-10	9.50E-10	7.40E-10	5.30E-09
4	2.70E-10	5.20E-11	1.60E-10	2.50E-09
5	1.30E-09	2.20E-09	1.35E-09	7.80E-09
6	6.50E-10	2.60E-10	1.10E-10	4.70E-09
7	1.60E-10	4.50E-10	1.30E-10	1.50E-09
8	2.50E-10	2.10E-10	1.70E-11	8.10E-10
Ty Ty, GA				
	treatment			
Sample period	1 - 2,4-D choline alone	2 - 2,4-D choline + glyphosate	3 - 2,4-D DMA	4 - 2,4-D EHE
1	8.60E-09	1.30E-07	2.90E-08	2.45E-09
2	3.80E-09	1.90E-09	9.30E-09	8.70E-08
3	1.20E-09	3.80E-10	3.60E-10	7.90E-09
4	3.60E-10	6.90E-11	1.60E-10	6.50E-09
5	7.30E-10	7.70E-10	4.60E-10	2.10E-08
6	3.00E-11	4.60E-11	9.80E-11	2.10E-09
7	9.50E-10	1.15E-09	4.60E-10	4.70E-09
8	1.50E-10	1.50E-10	9.40E-11	1.10E-09

The calculated fluxes with time (normalized by 1120 g 2,4-D a.e./ha) are shown in Figures 8 - 11. Cumulative mass loses, calculated as the areas under the normalized flux vs. time curves, are shown in Figures 12 - 15.

Figure 8 – Farmland, IN, fluxes

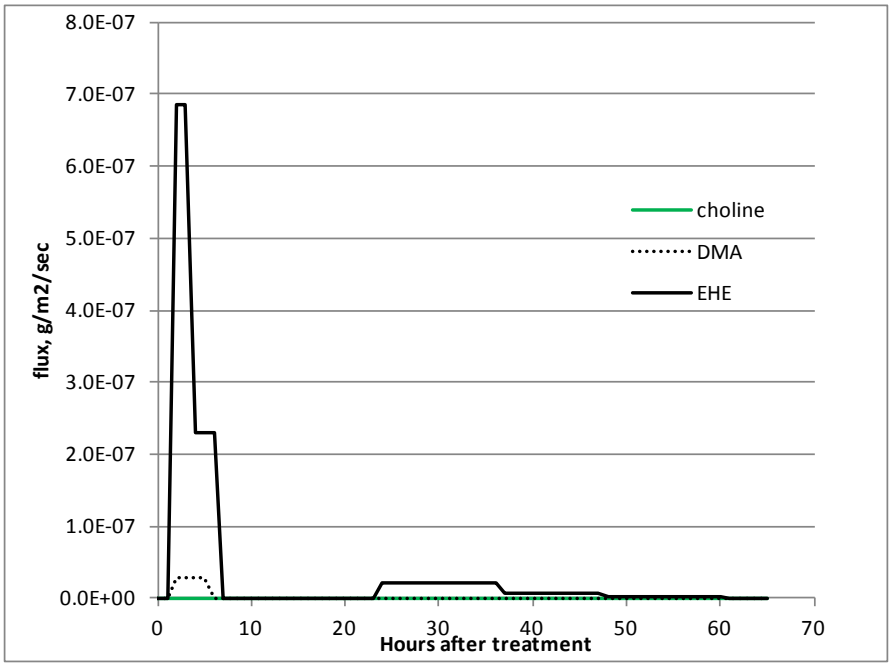


Figure 9 – Fowler, IN, fluxes

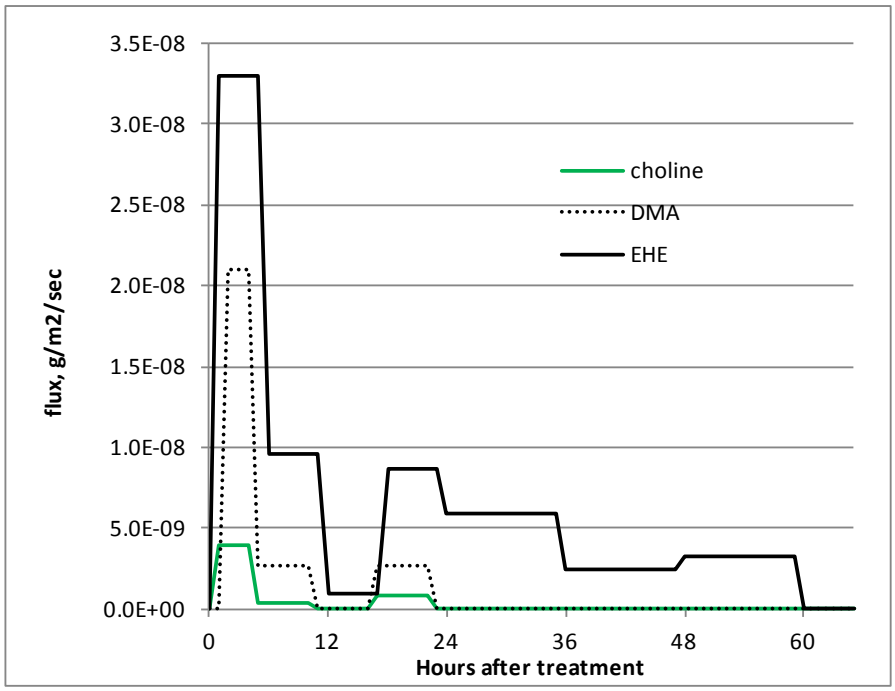


Figure 10 – Little Rock, AR, fluxes

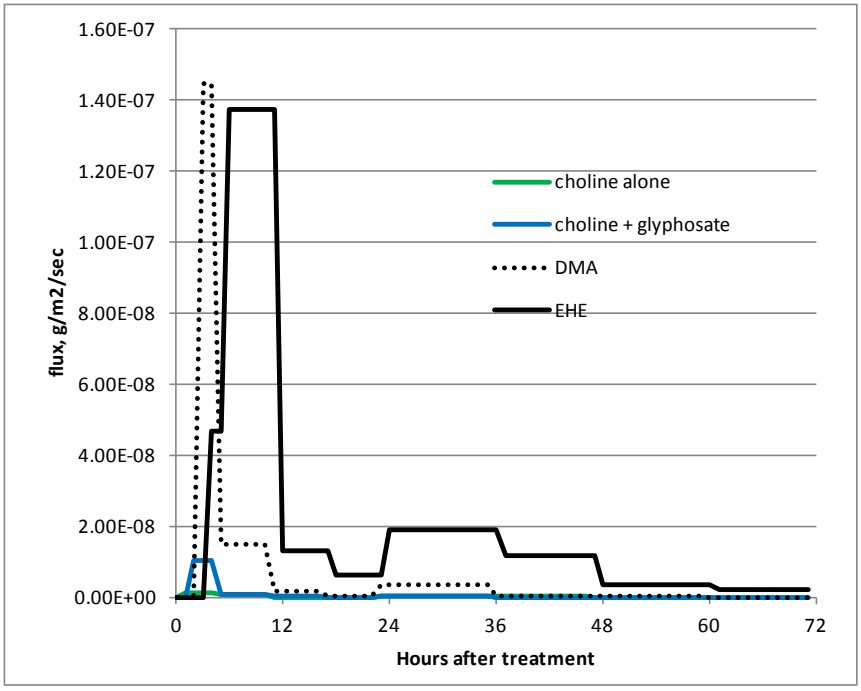


Figure 11 – Ty Ty, GA, fluxes

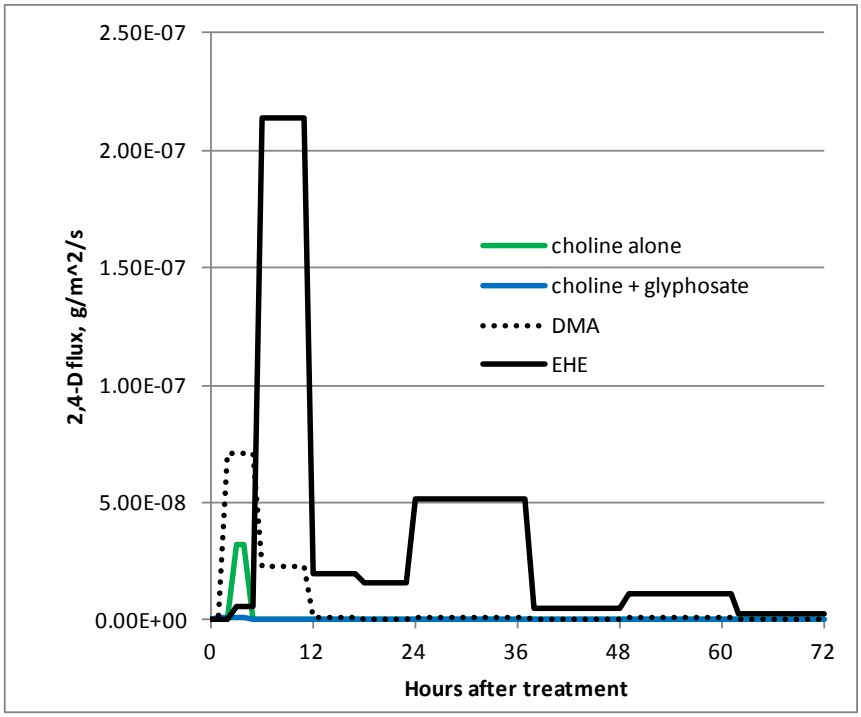


Figure 12 – Farmland, IN, cumulative mass losses

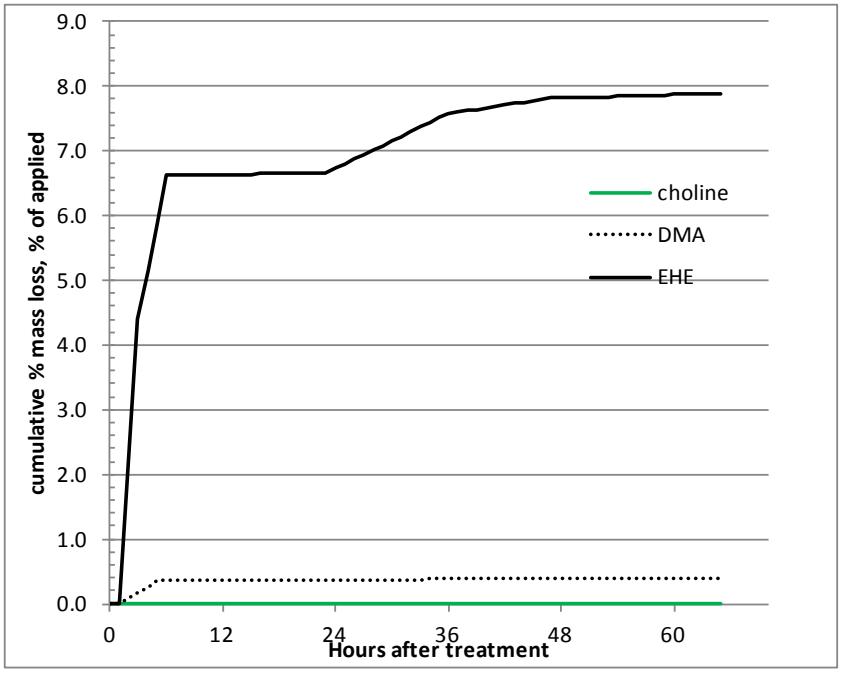


Figure 13 – Fowler, IN, cumulative mass losses

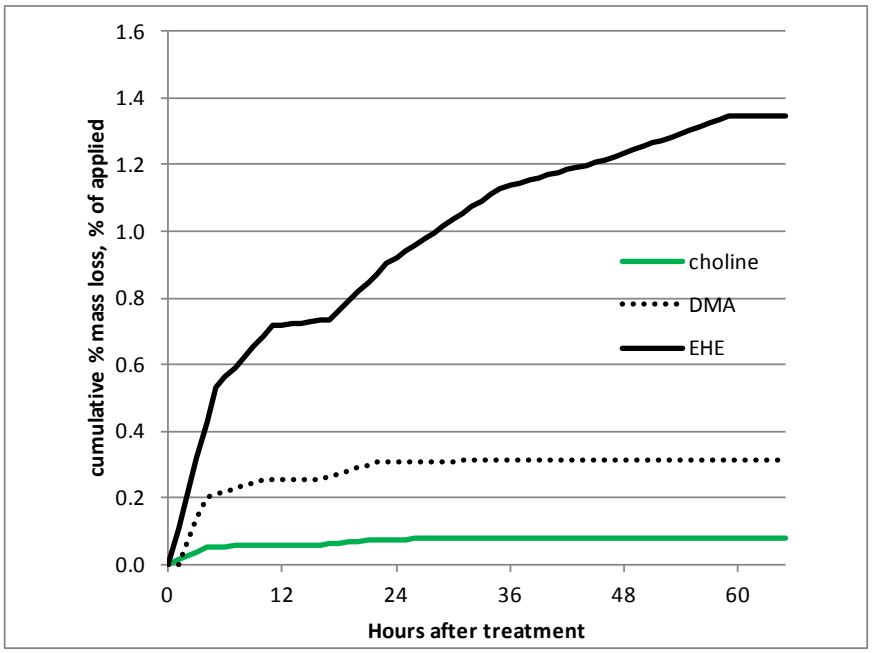


Figure 14 – Little Rock, AR, cumulative mass losses

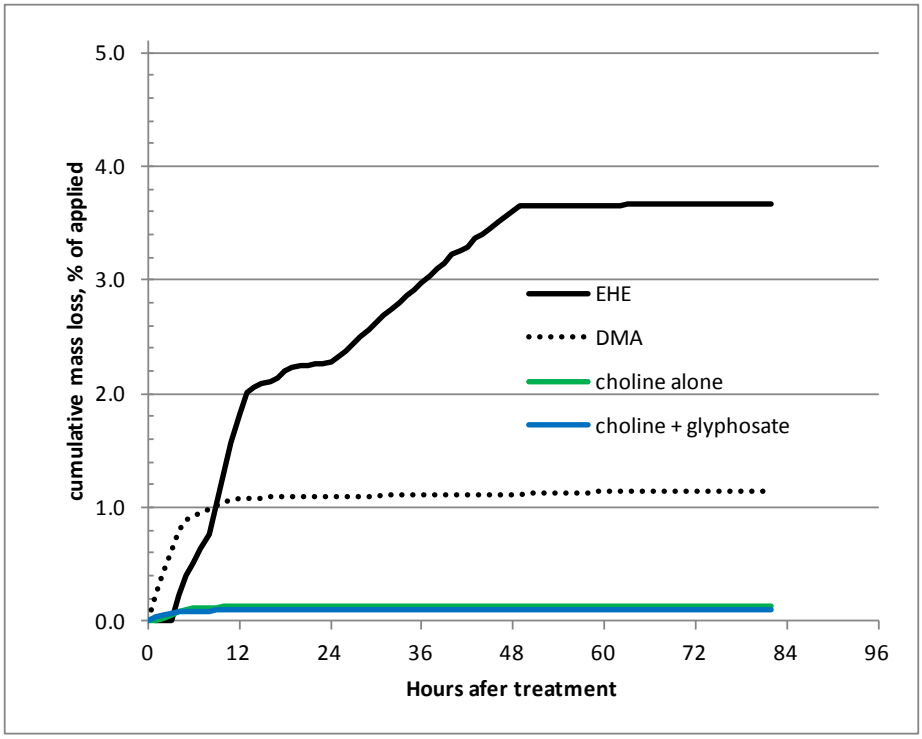
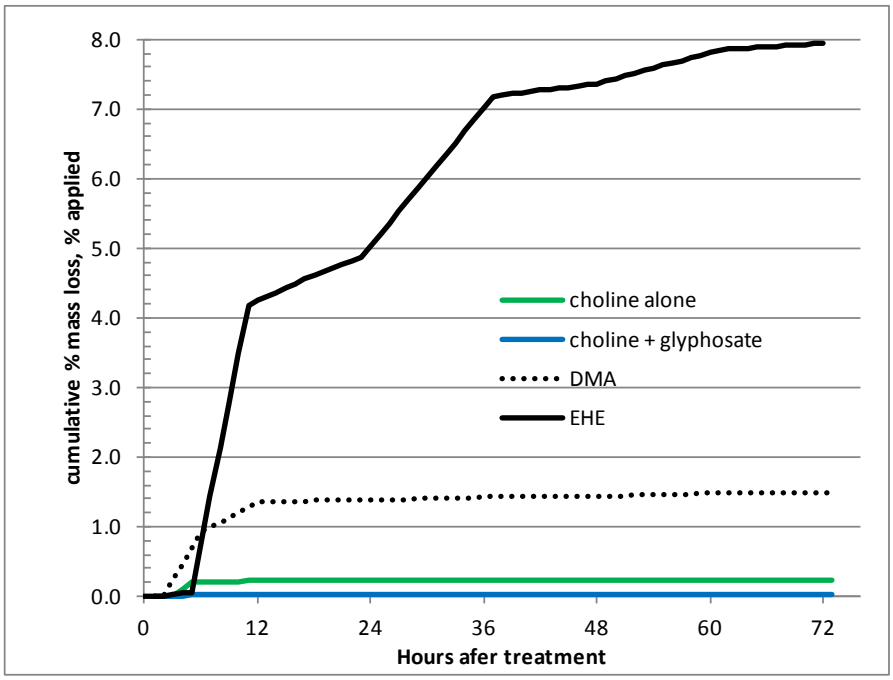


Figure 15 – Ty Ty, GA, cumulative mass losses



As expected, the mass losses are the largest for the ester form, followed by the DMA and choline salt forms. A summary of the cumulative mass losses is shown in Table 18.

Table 18 – Cumulated mass loss summary – Back-fitted fluxes (non-optimized)

	cumulative mass losses, % of applied (normalized to 1120 g 2,4-D a.e./ha)			
Treatment	Farmland, IN	Fowler, IN	Little Rock, AR	Ty Ty, GA
2,4-D EHE	7.87	1.35	4.76	7.94
2,4-D DMA	0.39	0.31	1.42	1.50
2,4-D choline alone	0.013	0.077	0.055	0.24
2,4-D choline + glyphosate	-	-	0.134	0.037
all choline (avg)	-	-	0.095	0.139

The average mass loss of ester across all four sites was 5.5% of applied, while the average losses for DMA and choline were 0.9% and 0.09% of applied, respectively, about 6 times less that the ester for DMA (85% reduction) and 60 times less for the choline (>98% reduction).

4.4.2. Optimized flux back-calculations with the BBCM

The calculated optimized fluxes were calculated accounting for the potential contributions of all fields at each test site. As described in Cryer, et al. (15) and Appendix F, this method attempts to improve fits to the observed concentrations by accounting for potential for cross-contamination between plots, as well as devolving the multiple-hour sampling results to an hourly time step.

Plots of the resulting optimized fluxes are shown in Figures 16-19, while the corresponding cumulative mass losses per treatment are shown in Figures 20-23. A summary of the optimized fitting statistics is shown in Table 19. Fits (measured as r^2 of linear regression of the observed vs. the modeling concentration values) were reasonable for the Farmland, Fowler and Little Rock site. At the Ty Ty site, the fit was excellent for the choline+glyphosate premix and overall, but only fair for the ester and choline alone treatments. In all cases, the largest losses occurred in the first 24 hours after treatment and generally within the first 12 hours. A smaller peak occurred in

the second day after application (most visible in the ester losses), reflecting the diurnal pattern of flux seen in previous studies with fumigants (e.g., 19).

Figure 16 – Farmland, IN, BBCM optimized hourly fluxes

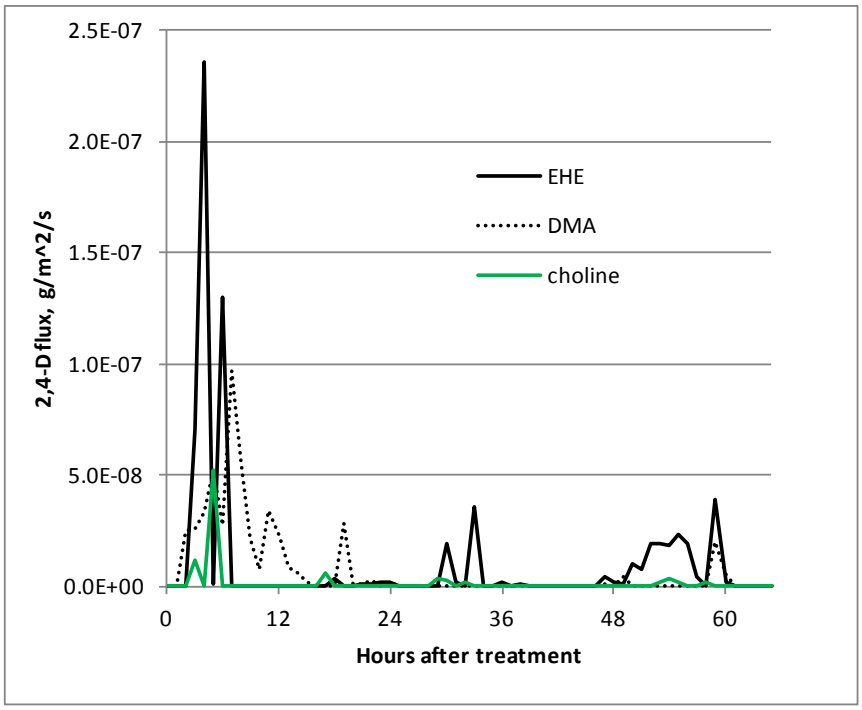


Figure 17 – Fowler, IN, BBCM optimized hourly fluxes

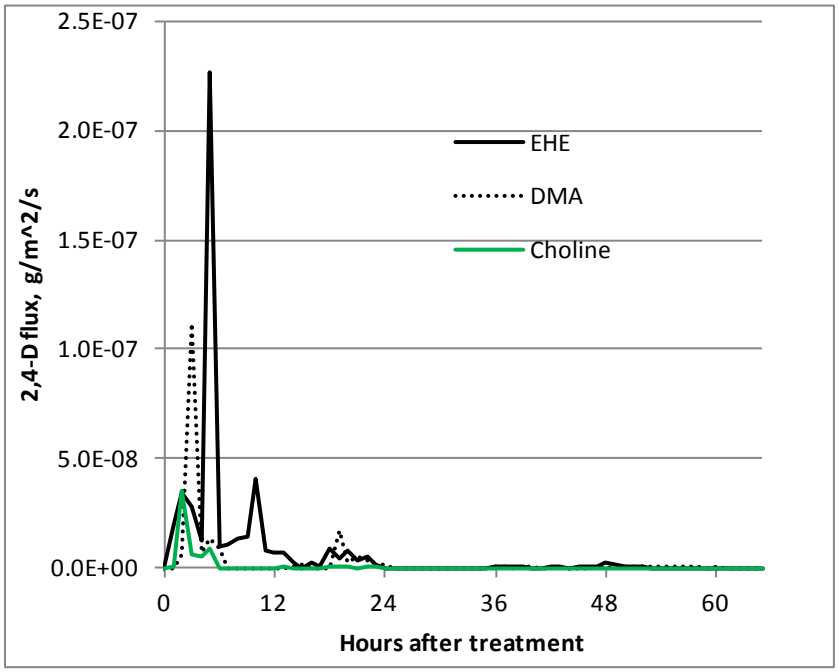


Figure 18 – Little Rock, AR, BBCM optimized hourly fluxes

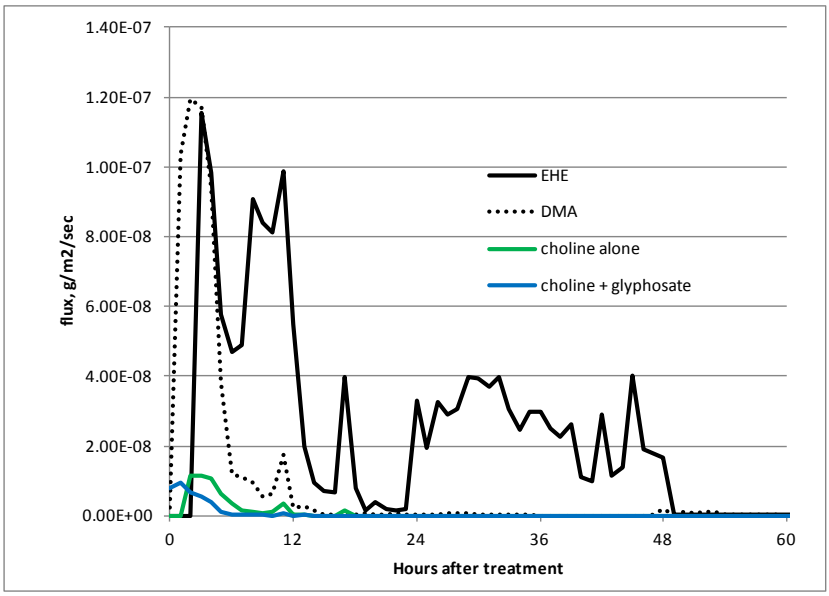


Figure 19 – Ty Ty, GA, BBCM optimized hourly fluxes

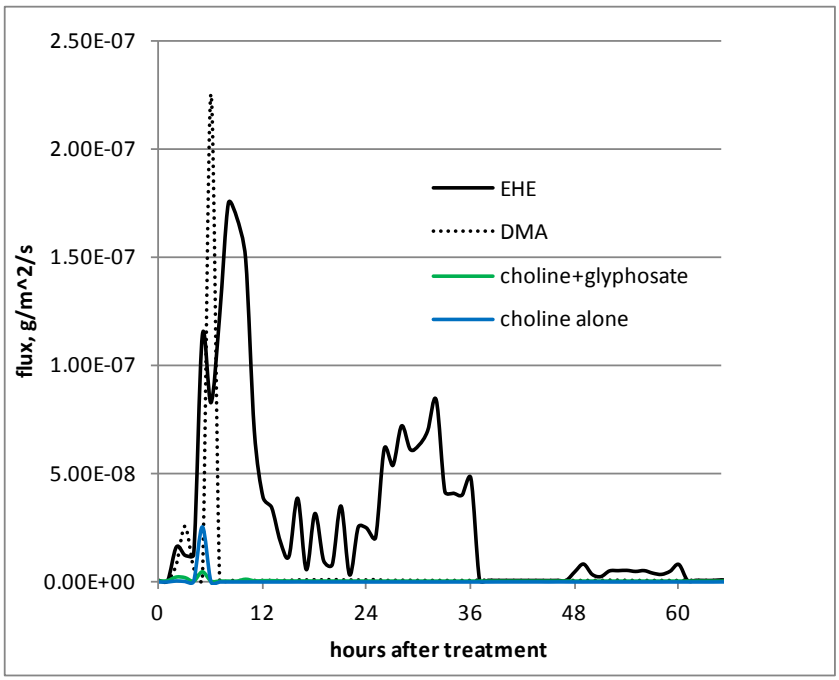


Figure 20 – Farmland, IN, BBCM optimized cumulative mass loss

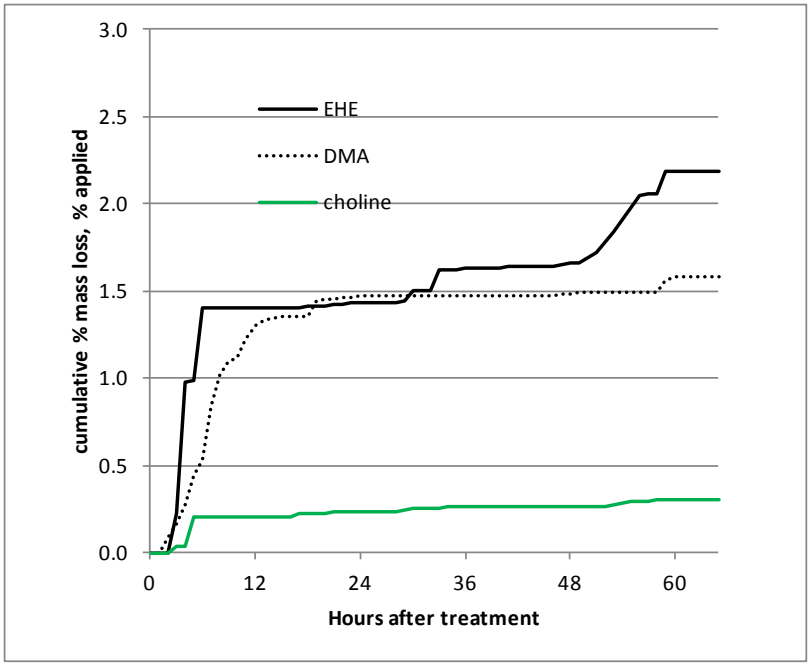


Figure 21 – Fowler, IN, BBCM optimized cumulative mass loss

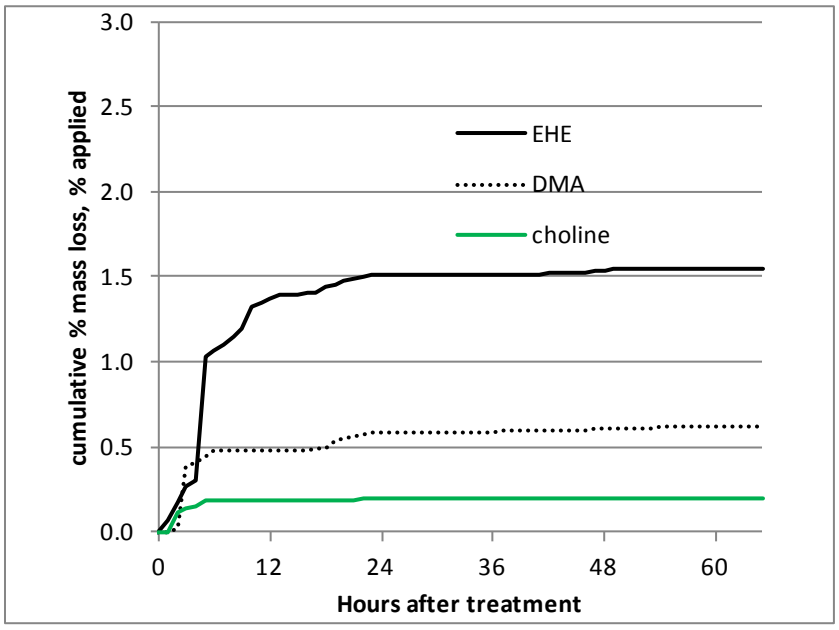


Figure 22 – Little Rock, AR, BBCM optimized cumulative mass loss

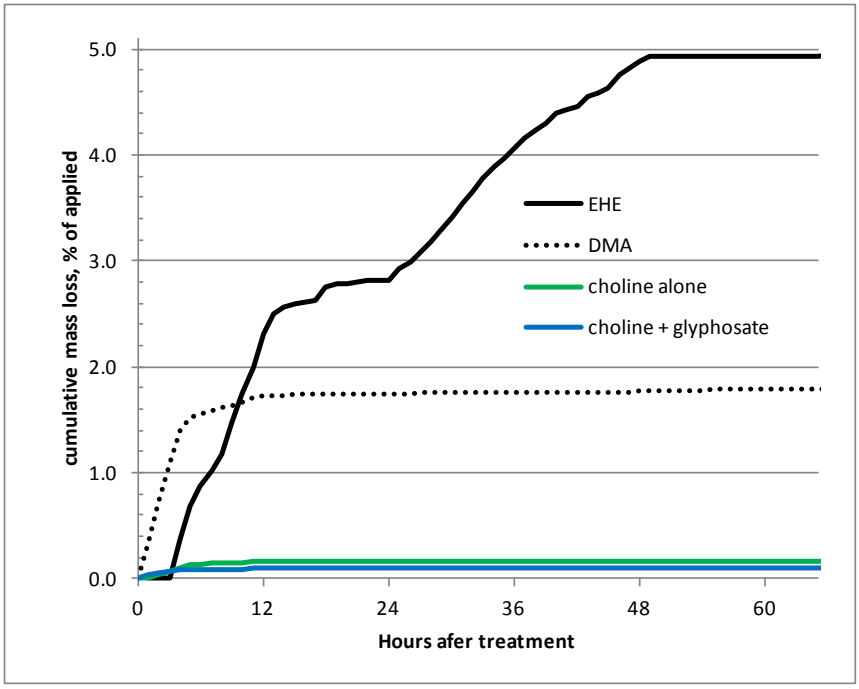


Figure 23 – Ty Ty, GA, BBCM optimized cumulative mass loss

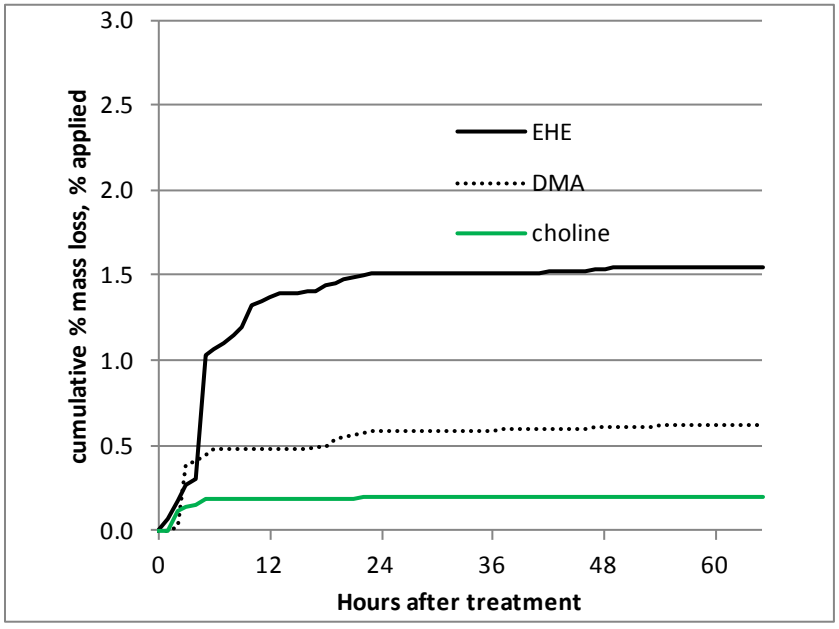


Table 19 – Fitting statistics from BCCM runs

2010 trials		2011 trials	
Fowler, IN	r^2	Little Rock, AR	r^2
2,4-D Ester	0.85	2,4-D Ester	0.59
2,4-D DMA	0.34	2,4-D DMA	0.87

2,4-D Choline	0.10	2,4-D Choline alone	0.72
Overall	0.54	2,4-D Choline+glyphosate	0.67
		Overall	0.69
Farmland, IN		Ty Ty, GA	
2,4-D Ester	0.54	2,4-D Ester	0.36
2,4-D DMA	0.74	2,4-D DMA	0.54
2,4-D Choline	0.55	2,4-D Choline alone	0.31
Overall	0.55	2,4-D Choline+glyphosate	0.79
		Overall	0.73

A comparison of the cumulative mass losses for each treatment, calculated by both the Back-Calculation and BBCM methods are shown in Table 20. Across sites, the average mass loss of ester via the BBCM method was 3.7% vs. 5.5% with the standard back-calculation method. An analogous comparison for DMA was 1.1% vs. 1.2% with the standard and BBCM methods, respectively, while choline averages were 0.09% and 0.15%. Based on the BBCM results, the average reduction of mass loss from ester to choline (both choline formulations) was 94.3%, while the reduction from DMA to choline was 86.2%. On average, BBCM gave nominally higher flux values, although individual cases did not show a consistent pattern. Further examination of the observed versus modeled concentrations are shown in Appendix F.

Table 20 – Cumulative mass losses from back-calculation and BBCM fluxes

	cumulative mass losses, % of applied (normalized to 1120 g 2,4-D a.e./ha)			
	Farmland, IN		Fowler, IN	
Treatment	Back-calculation	BBCM	Back-calculation	BBCM
2,4-D EHE	7.87	2.19	1.35	1.55
2,4-D DMA	0.39	1.58	0.31	0.62
2,4-D choline alone	0.013	0.3	0.077	0.2
	Little Rock, AR		Ty Ty, GA	
Treatment	Back-calculation	BBCM	Back-calculation	BBCM
2,4-D EHE	4.76	4.95	7.94	6.13
2,4-D DMA	1.42	1.79	1.50	0.85

2,4-D choline alone	0.055	0.17	0.24	0.085
2,4-D choline + glyphosate	0.134	0.098	0.037	0.032
all choline (avg)	0.095	0.134	0.139	0.06

4.5. Extrapolation to larger field sizes

A theoretical field of 40 acres (16 ha; 400 x 400 m) was parameterized for ISCST-3. Individual runs were executed with each set of optimized normalized fluxes and the experimental weather files for each study site. A receptor array of rings and spokes about the modeled field (2041 receptors) was taken from the inputs for the PERFUM2 model (20). Results for the 6-hour period exhibiting the highest BBCM flux (0-6 hours after treatment except in the Ty Ty site for ester, where the 2nd 6-hour period was used), expressed as the ($\mu g/m^3$)-hr dose metric, are displayed in the contour plots shown in Figures 24 through 27. All axes are distances in meters and the hatched square in the center of each plot represents the treated field; note that the scaling is logarithmic to best show the differences.

As expected, the extrapolated dose levels mirror those seen with fluxes and cumulative mass losses – ester doses are much higher than the salt forms, with the choline salt yielding the lowest predicted doses. For the choline salt treatments (stand-along or premixed with glyphosate), doses did not approach the 1 ($\mu g/m^3$)-hr level except very near the downwind field margins. The modeled off-field doses are likely to be below the levels to cause appreciable effect upon plants with the salt forms of 2,4-D, based upon the effects research described in Section 3.3.3. Spatial analysis of graphics such as these would allow the coupling of exposure with effects to estimate non-target plant risk associated with volatility and vapor transport off site for any time interval or field size of interest. As a higher tier approach, a probabilistic evaluation of off-field concentrations could be undertaken with tools such as PERFUM2, taking special note of the application date window for the product of Spring to mid-Summer.

Figure 24 – Extrapolated 6-hour dose, Farmland, IN site

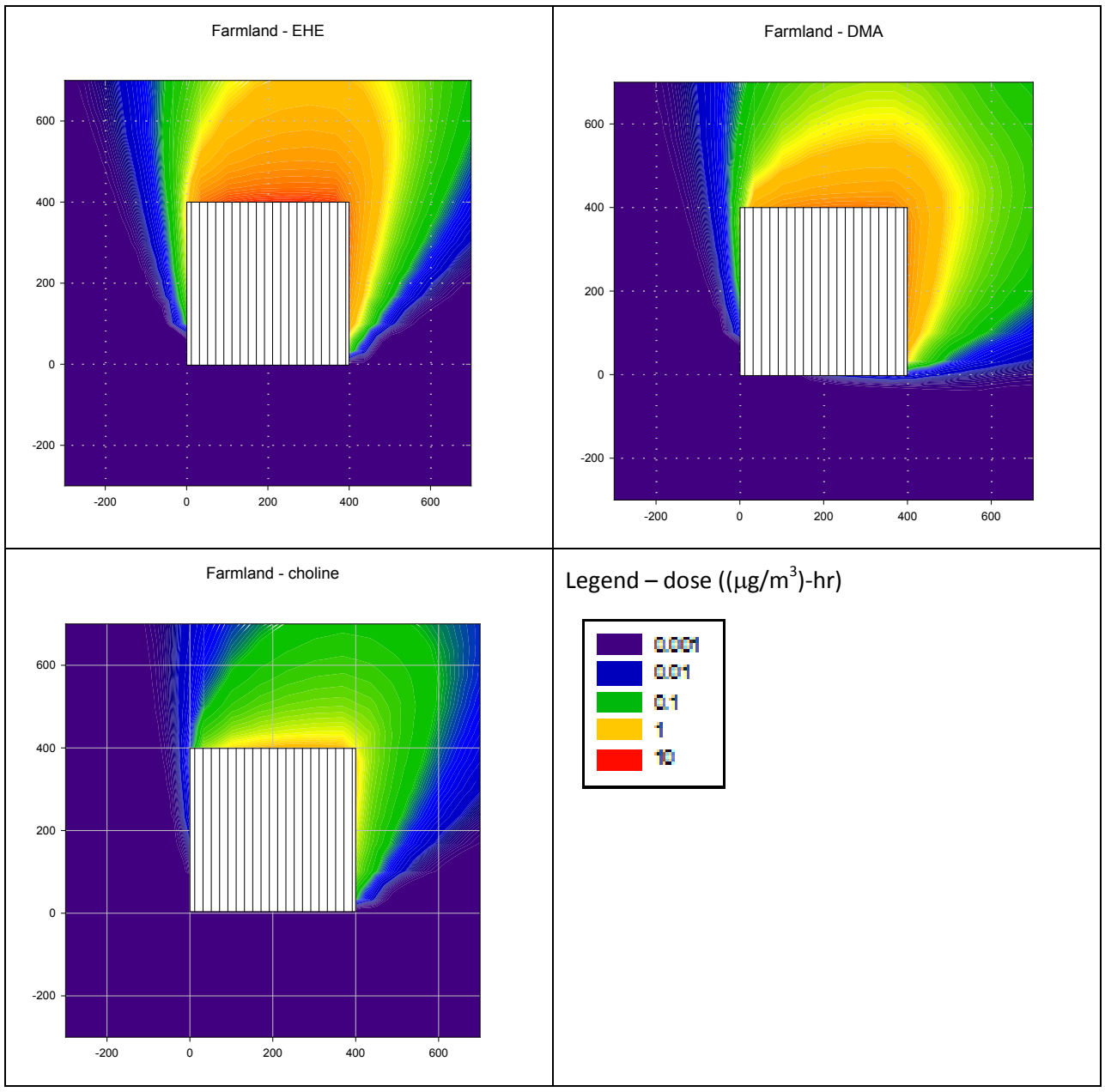


Figure 25 – Extrapolated 6-hour dose, Fowler, IN site

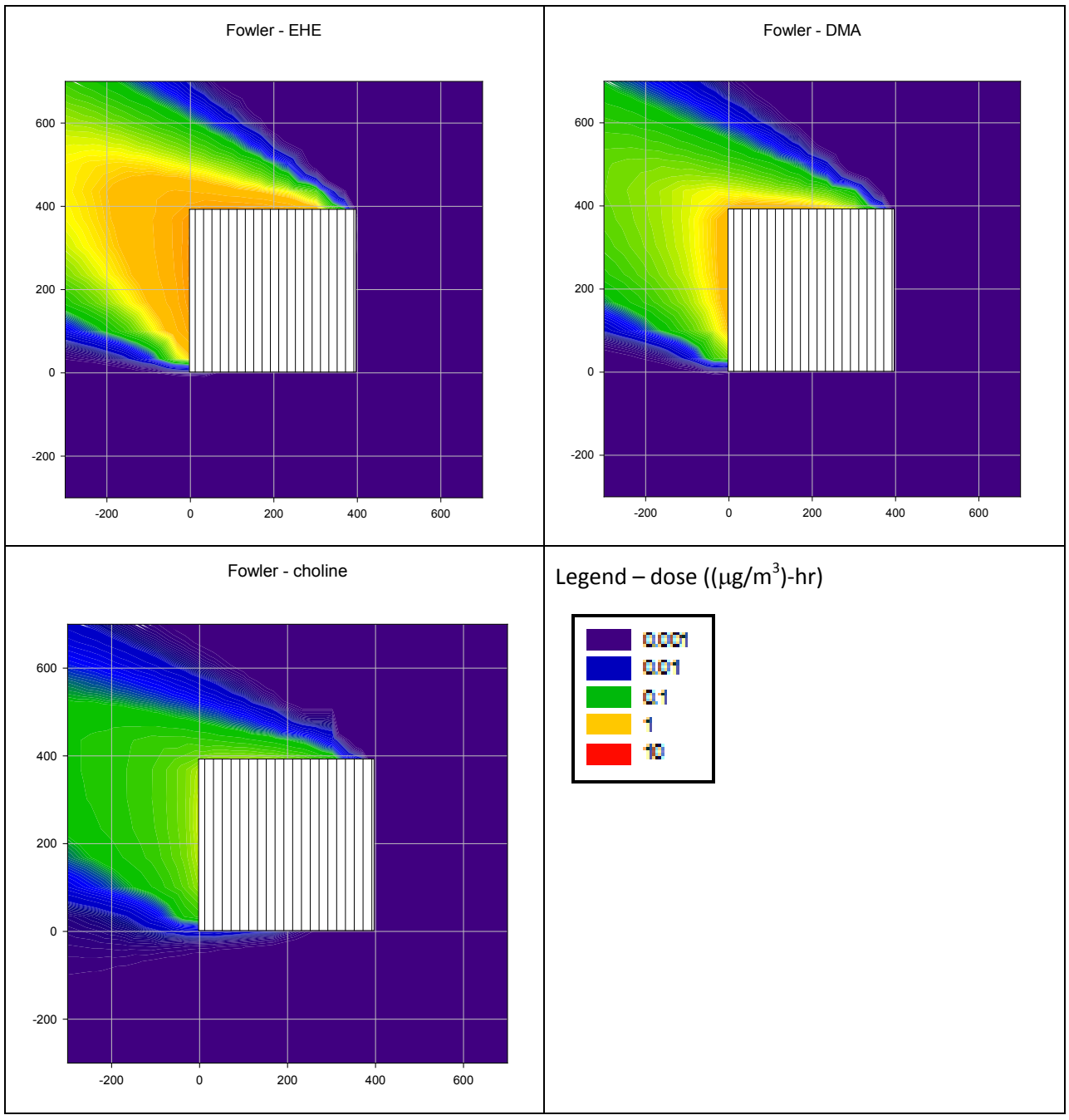
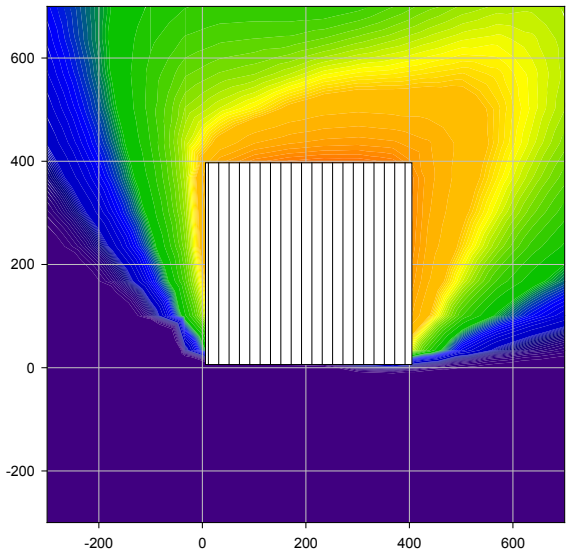
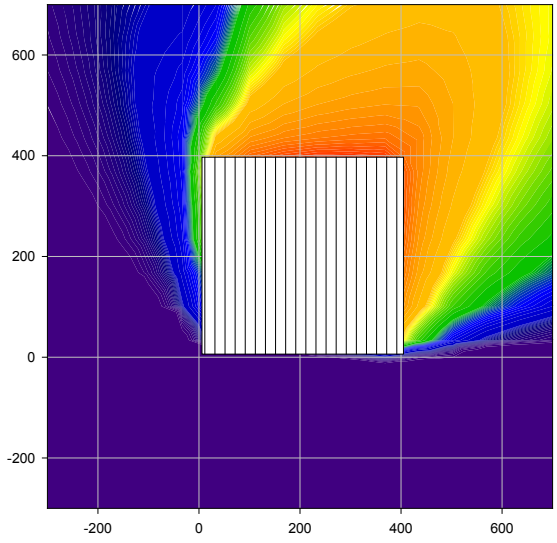


Figure 26 – Extrapolated 6-hour dose, Little Rock, AR site

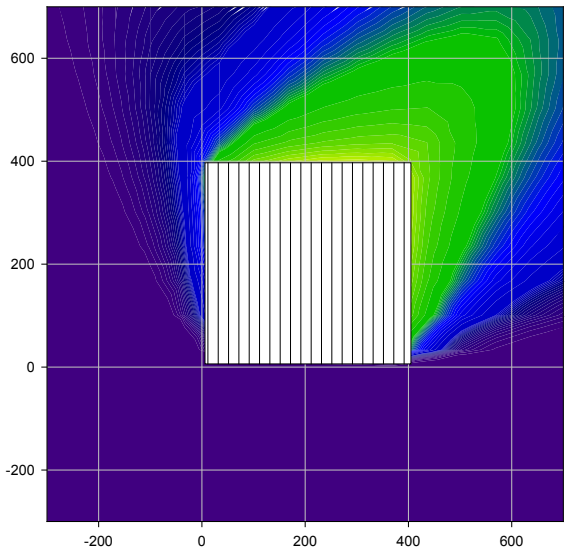
Little Rock - EHE



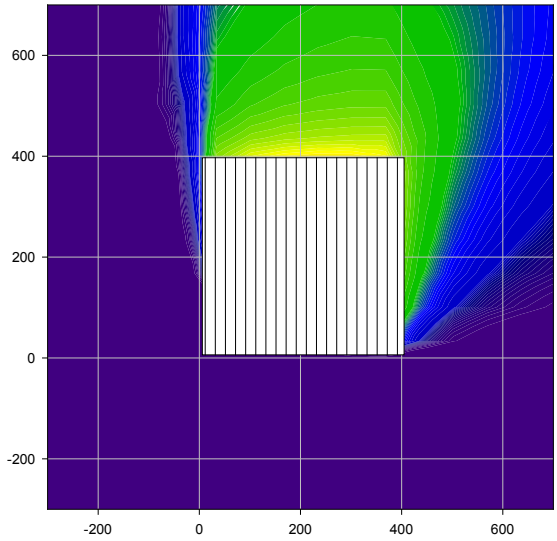
Little Rock - DMA



Little Rock - choline alone



Little Rock - choline + glyphosate



Legend – dose ((µg/m^3)-hr)

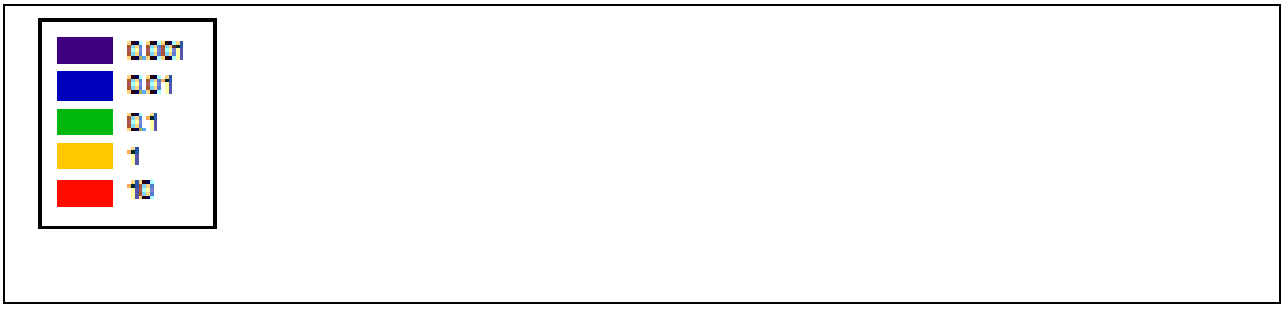
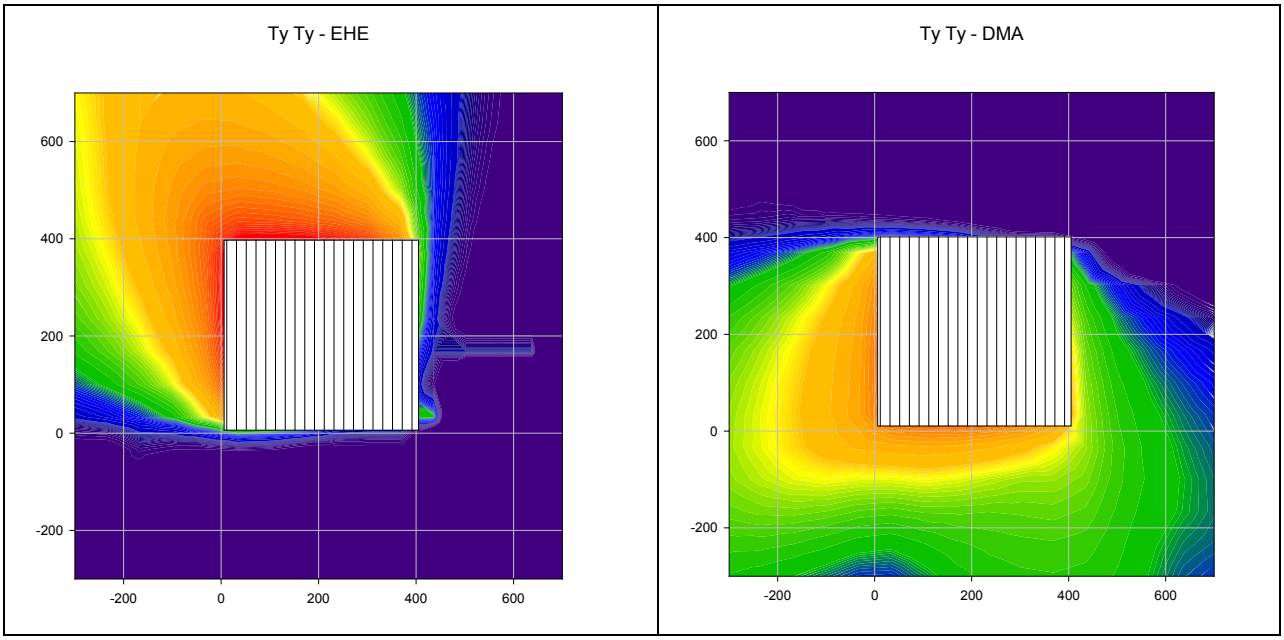
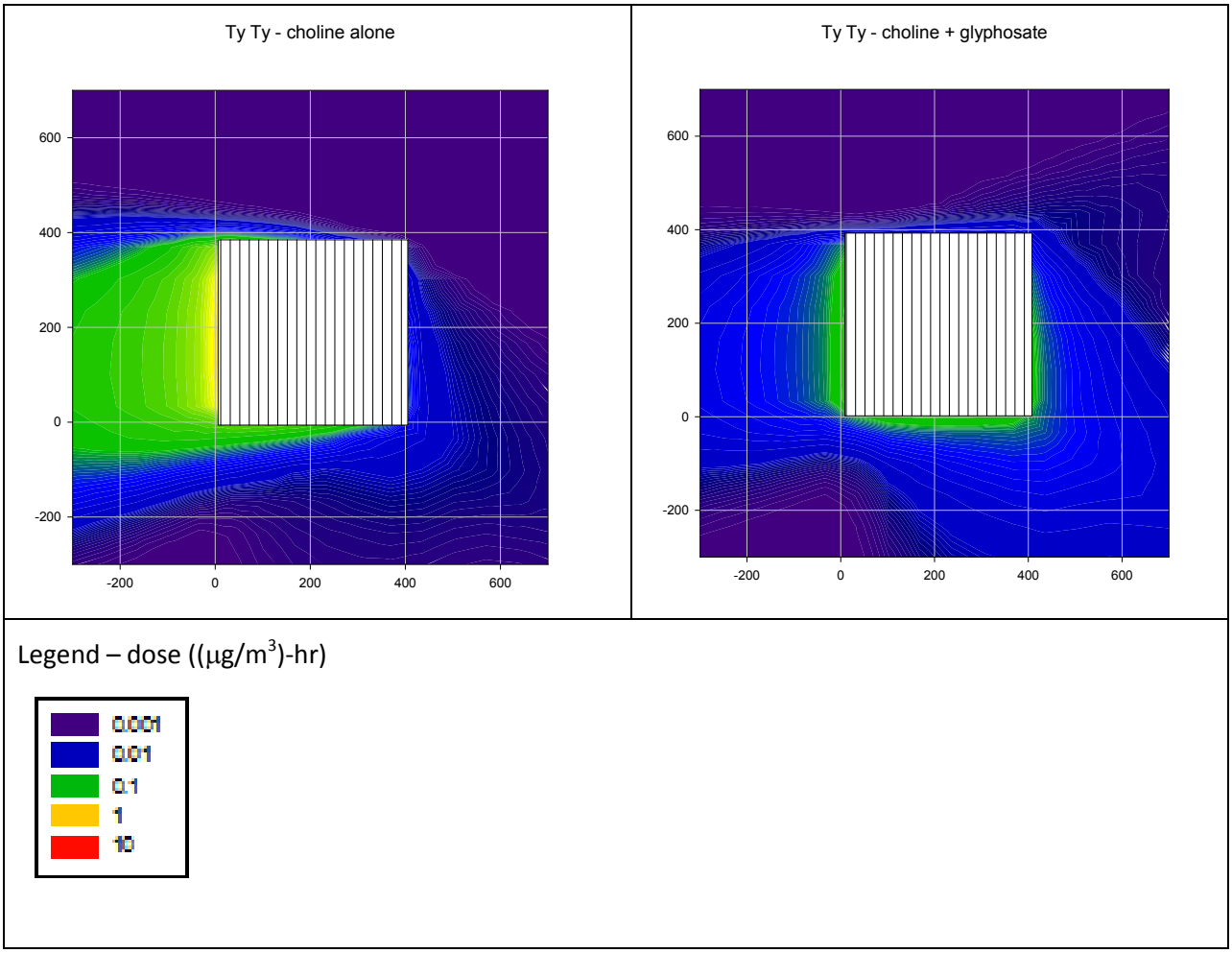


Figure 27 – Extrapolated 6-hour dose, Ty Ty, GA site





5. CONCLUSIONS

Based upon results generated in four separate experimental sites, the potential for volatility loss of three different forms of 2,4-D was shown to confirm previous findings from laboratory and greenhouse testing. The choline salt form of 2,4-D was found to exhibit 86 to 99% (mean 94%) lower mass loss over a 72-hour period than the ethylhexyl ester form of the herbicide. Compared to the dimethylamine form of the herbicide, the choline salt yielded a 68 to 95% (mean 86%) reduction in volatility loss.

Fluxes were estimated with both a standard back-calculation method, as well as an improved and novel methodology, the Better Back-Calculation Method (BBCM), that accounted for potential

cross-plot contamination and the devolving of time-weighted measurements into hourly fluxes. Further improvements in the BBCM, for example accounting for individual receptor sample time effects, could improve the accuracy of the hourly fluxes estimates.

Estimated fluxes were employed to parameterize representative commercial-size field simulations. By comparing these initial dose estimates to preliminary dose-response curves for several sensitive plant species, the analysis indicated that there is likely a low potential for off-target sensitive plant damage from transport of 2,4-D vapor residues following application of formulations containing the 2,4-D choline salt.

6. RETENTION OF RECORDS AND ACKNOWLEDGEMENTS

Field data, electronic records and modeling inputs and outputs will be retained in the Dow AgroSciences Archive facility.

The contributions of field station personnel at the Dow AgroSciences Fowler Midwest Research Center and the Purdue Davis Research Farm are gratefully acknowledged.

7. REFERENCES

1. Guenzi, W.D., Beard, W.E. 1974. Volatilization of Pesticides. *In* Guenzi, W.D., Ahlrichs, J.L., Chester, G., Bloodworth, M.E., Nash, R.G. (eds), Pesticides in Soil and Water. Madison, WI, Weed Science Society of America. pp 107-122.

2. Taylor, A.W. and Glotfelty, D.E. (1988). Evaporation from soils and crops. *In* Grover, R. (ed), Environmental Chemistry of Herbicides., Volume 1, Boca Raton, Florida, CRC Press, pp. 89-129.

3. Bovey, RW.,Young, A.L. 1980. The Science of 2,4,5-T and Associated Phenoxy Herbicides. New York: J.Wiley.

4. Sciumbato, A.S., Chandler, J.M., Senseman, S.A., Bovey, R.W., Smith, K.L. 2004. Determining Exposure to Auxin-Like Herbicide. II. Practical Application to Quantify Volatility. *Weed Technol* **18**:1135-1142.

5. Adams, D.F., Jackson, C.M., Bamesberger, W.L. 1964. Quantitative Studies of 2,4-D Esters in the Air. *Weeds* **12**(4), 280.

6. Ouse, D.G., Gifford, J., Ahmed, A., Jenning, C. 2011. Laboratory Evaluations of New Forms of 2,4-D for Volatility and Potential to Damage Non-Target Plants. *Proceedings, Southern Weed Science Society*, 64:187.

7. USDA-NRCS. Web Soil Survey. URL: http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm, accessed 30-January-2012.

8. Pasquill, F., 1961. The Estimation of the Dispersion of Windborne Material, *Meteorol Mag* **90**, 33-49.

9. ISCST3. Users Guide for the Industrial Source Complex (ISC3) Dispersion Models, Vol. 1-User's Instructions; U.S. Environmental Protection Agency, Office of Air Quality

Planning and Standards Emissions, Monitoring, and Analysis Division: Research Triangle Park, NC, Sept 1995; EPA-454/B-95-003a.

10. Scire, J.S., Strimaitis, D.G., Yamartino, R.J.. 2000. A User's Guide for the CALPUFF Dispersion Model (Version 5). Earth Tech, Inc., Concord, MA

11. AERMOD, 1998. User's Guide for the AMS/EPA Regulatory Model – AERMOD, Revised Draft, U.S. EPA, Office of Air Quality Planning Standards, November 1998

12. Cryer, S.A., van Wesenbeeck, I.J., Knuteson, J.A. 2003. Predicting Regional Emissions and Near-Field Air Concentrations of Soil Fumigants Using Modest Numerical Algorithms: A Case Study Using 1,3-Dichloropropene. *J Agric Food Chem* **51**, 3401-3409

13. Honaganahalli, P.S., Seiber, J.N.. 2000. Measured and Predicted Airshed Concentrations of Methyl Bromide in an Agricultural Valley and Applications to Exposure Assessment. *Atmos Environ* **34**, 3511-3523.

14. Ross, L.J.,Johnson, B.,Kim, K.D., Hsu, J.. 1996. Prediction of Methyl Bromide Flux from Area Sources Using the ISCST Model. *J. Environ. Qual.* 25:885-891.

15. Cryer, S.A., Havens, P.L., Hillger, D.E., van Wesenbeek, I.J. 2012. Updated Report: An Improved Indirect Procedure for Estimating Pesticide Volatility Flux from Neighboring Area Sources. Unpublished report of Dow AgroSciences; report 120966).

16. Breeze, V.G., van Rensburg, E. 1991. Vapour of the Free Acid of the Herbicide 2,4-D is Toxic to Tomato and Lettuce Plants. *Environmental Pollution*, **72**:259-267.

17. Ouse, D.G., Gifford, J.M., Ahmed, A.A., Jennings, C.J. 2012. Effects of Vapor Phase Exposure to 2,4-D Acid on Cotton, Grapes, Tomato and Soybeans. Unpublished study of Dow AgroSciences LLC, report 120944, 9-Aug-2012.

18. Breeze, V.G. 1990. Uptake of Tomato Plant of the Herbicide [^{14}C] 2,4-D butyl in the Vapour Phase. *Pestic Sci* **29**:9-18.

19. van Wesenbeek, I.J., Knuteson, J.A., Barnekow, D.E., Phillips, A.M. 2007. Measuring Flux of Soil Fumigants Using the Aerodynamic and Dynamic Flux Chamber Methods. *J Environ Qual* **36**: 613-620.

20. Reiss, R., Griffin, J. 2008 User's Guide for the Probabilistic Exposure and Risk model for FUMigants (PERFUM), version 2.5, Exponent Corporation, Cary, NC, USA. 6-June-2008. URL: http://www.exponent.com/files/uploads/documents/perfum/perfum%202%20users%20guide,%20v2.5.pdf, accessed 16-Aug-2012.

8. APPENDIX A – ANALYTICAL METHODS

8.1. 2010 Sites

DETERMINATION OF RESIDUES OF (2,4-DICHLOROPHENOXY)ACETIC ACID IN AIR SAMPLING TUBES BY HIGH PERFORMANCE LIQUID CHROMATOGRAPHY WITH MASS SPECTROMETRY DETECTION

7. PREPARATION OF STANDARDS

7.1. Preparation of Fortification Solutions

7.1.1. Weigh 0.1000 g of (2,4-dichlorophenoxy)acetic acid analytical standard and quantitatively transfer to a 100-mL volumetric flask with methanol. Dilute to volume to obtain a 1000-µg/mL stock solution.

7.1.2. Pipet 50.0 mL of the 1000-µg/mL solution from Section 7.1.1 into a 200-mL volumetric flask and dilute to volume with methanol to obtain a 250.0-µg/mL solution.

7.1.3. Pipet 20.0 mL of the 250.0-µg/mL solution from Section 7.1.2 into a 200-mL volumetric flask and dilute to volume with methanol to obtain a 25.0-µg/mL solution.

7.1.4. Pipet 20.0 mL of the 25.0-µg/mL solution in Section 7.1.3 into a 200-mL volumetric flask and dilute to volume with methanol to obtain a 2.50-µg/mL solution.

7.1.5. Pipet 20.0 mL of the 2.50-µg/mL solution in Section 7.1.4 into a 200-mL volumetric flask and dilute to volume with methanol to obtain a 0.250-µg/mL solution.

7.1.6. Prepare solutions for fortifying samples by diluting the above stock solutions from Sections 7.1.2-7.1.5 with methanol as follows:

Concentration of Stock Soln.	Aliquot of Stock Soln.	Final Soln. Volume	Spiking Soln. Final Conc.	Equivalent Sample Conc.[a]
µg/mL	mL	mL	µg/mL	µg/tube
0.250	60.0	100	0.150	0.0015
0.250	--	--	0.250	0.0025
2.50	20.0	100	0.500	0.0050
2.50	50.0	100	1.25	0.0125
2.50	--	--	2.50	0.0250
25.0	20.0	100	5.00	0.0500
25.0	50.0	100	12.5	0.125
25.0	--	--	25.0	0.250
250.0	20.0	100	50.0	0.500
250.0	50.0	100	125.0	1.25
250.0	--	--	250.0	2.50

[a] The equivalent sample concentration is based on fortifying an air sampling tube with

10.0 µL of spiking solution.

7.2. Preparation of the Staple-Isotope Internal Standard Solution

7.2.1. Using a positive-displacement pipet, dispense 50 µL of the 100 µg/mL $^{13}C_6$-(2,4-dichlorophenoxy)acetic acid stable-isotope internal standard solution into a 10.0-mL volumetric flask and dilute to volume with methanol. This solution contains 0.500 µg/mL of $^{13}C_6$-(2,4-dichlorophenoxy)acetic acid.

7.2.2. Using a positive-displacement pipet, dispense 500 µL of the 100 µg/mL $^{13}C_6$-(2,4-dichlorophenoxy)acetic acid stable-isotope internal standard solution into a 4000-mL volumetric flask containing approximately 3000 mL of 0.02 N hydrochloric acid. Swirl the flask and dilute to volume with 0.02 N hydrochloric acid to obtain a solution containing 12.5 ng/mL of $^{13}C_6$-(2,4-dichlorophenoxy)acetic acid.

7.3. Preparation of Calibration Standards for Samples

7.3.1. Prepare calibration standards by dispensing 250 µL of the 0.500-µg/mL $^{13}C_6$-(2,4-dichlorophenoxy)acetic acid stable-isotope internal standard solution from Section 7.2.1 and 10.0 µL of the 0.00-50.0-µg/mL spiking solutions from Section 7.1.6 into a series of 20-mL volumetric flasks and dilute to volume with a methanol/water solution (40:60) containing 0.1% acetic acid.

7.3.2. Firmly stopper the flask mix the standards for 1-2 seconds. The concentrations of the calibration standards are as follows:

Concentration of Spiking Soln.	Aliquot of Spkg. Soln.	Final Soln. Volume	Calib Soln. Final Conc.	Equivalent Sample Conc.[a]
µg/mL	µL	mL	ng/mL	µg/tube
0.000	10.0	20.0	0.000	0.0000
0.150	10.0	20.0	0.075	0.0015
0.250	10.0	20.0	0.125	0.0025
0.500	10.0	20.0	0.250	0.0050
1.25	10.0	20.0	0.625	0.0125
2.50	10.0	20.0	1.25	0.0250
5.00	10.0	20.0	2.50	0.0500
12.5	10.0	20.0	6.25	0.125
25.0	10.0	20.0	12.5	0.250
50.0	10.0	20.0	25.0	0.500

[a] The equivalent sample concentration is based on fortifying an air sampling tube with 10.0 µL of spiking solution and a final volume of 500 µL.

8. INSTRUMENTAL CONDITIONS

8.1. Typical Operating Conditions Using the Agilent 1100 HPLC System

Instrumentation: Agilent Model 1100 degasser
Agilent Model 1100 binary pump

	Agilent Model 1100 autosampler Agilent Model 1100 column oven
Column:	Phenomenex Synergi Hydro-RP 80A 4.6 x 75 mm, 4-µm
Column Temperature:	35 °C
Injection Volume:	50 µL
Injection Port Wash Wash Solution Wash Time	on methanol/water (80:20) 10 seconds
Run Time:	approximately 12 minutes
Mobile Phase:	A – water containing 0.10% acetic acid B – methanol containing 0.10% acetic acid
Mobile Phase Split:	approximately 200 µL/min split to source

GRADIENT:

Time (min)	Flow Rate (mL/min)	Solvent A (percent)	Solvent B (percent)
0:00	1.00	70	30
1:00	1.00	70	30
6:00	1.00	0	100
8:00	1.00	0	100
9:00	1.00	70	30
12:00	1.00	70	30

Flow Diverter	
Flow to Waste	0.0 min → 4.6 min
Flow to Source	4.6 min → 7.6 min
Flow to Waste	7.6 min → end of run

8.2. Typical Operating Conditions Using the Applied Biosystems API 3000 Mass Spectrometer

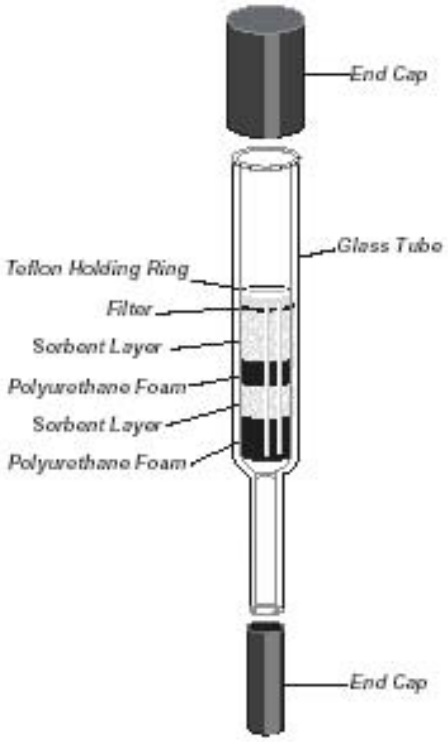
Instrumentation:	Applied Biosystems API 3000 MS System Applied Biosystems Analyst 1.51 data system
Ionization Mode:	electrospray
Polarity:	negative
Scan Type:	MRM
Resolution:	Q1 – unit, Q3 – unit
Nebulizer Gas (NEB)	12 psi
Curtain Gas (CUR)	10 psi
Collision Gas (CAD):	8 psi
Ion Source Gas 1 (GS1)	8 psi
Ion Source Gas 2 (GS2)	8000 mL/min

Temperature (TEM):	525 °C
Focusing Potential (FP):	-110 volts
Entrance Potential (EP):	-10 volts
Ion Spray Voltage (IS):	-4300 volts
Acquisition Time Delay:	0.00 minutes
Period Duration:	12.00 minutes
Dwell Time:	50 ms

Analytes:	Precursor Ion, Q1	Product Ion, Q3	Declustering Potential, v	Collision Energy, v	Cell Exit Potential, v
2,4-D					
quantitation	218.9	160.7	-23	-18	-11
confirmation	220.9	162.7	-23	-18	-11
2,4-D (M+6 ISTD)					
quantitation	224.9	166.7	-25	-18	-11
confirmation	227.0	168.7	-25	-18	-11

9. SAMPLE DESCRIPTION

The contents of each OVS sampling tubes are divided into two separate samples. The 'front section', which consists of a PTFE retainer ring, a glass fiber filter, 270 mg of XAD-2 sorbent, and a foam separator plug represent one sample while the rear, or 'back-up section', consisting of 140 mg of XAD-2 sorbent and a foam retention plug, represents the second sample. Both sections are analyzed together to represent one sample (tube). See the diagram below.



10. DETERMINATION OF RECOVERY OF 2,4-D FROM TWO-PART AIR SAMPLING TUBES

10.1. Sample Storage

Sample tubes should be stored frozen at approximately -20 °C prior to analysis.

10.2. Sample Preparation when the Front and Back Sections are to be Analyzed Separately

10.2.1. For recovery samples, fortify the sorbent tube by applying a 10-µL aliquot of the appropriate spiking solution to the sorbent using a 10-µL syringe. Pass the needle of the syringe through the glass fiber filter and inject the contents into the sorbent contained in the front section of the tube. Allow the solvent to evaporate for approximately 10 minutes prior to extraction.

10.2.2. Neutralize any static electricity on the sampling tube using an anti-static gun.

10.2.3. Using forceps, transfer the PTFE retaining ring, the glass fiber filter, and the XAD-2 sorbent from the front section of the tube to a 20-mL glass vial labeled ‘front’.

10.2.4. Wet a cotton swab in the methanol/0.1 N sodium hydroxide (90:10) extraction solution, shake to remove the excess solvent and, ensuring that the solvent does not wet the polyurethane foam plug, wipe the inside of the sorbent tube to remove any analyte residue and assist in the removal of residual resin deposited on the glass. Repeat this step with another cotton swab and then allow the tube to dry.

10.2.5. Transfer any remaining XAD-2 sorbent particles into the vial labeled 'front'.

10.2.6. Using a pair of scissors or diagonal cutters, cut the wooden sticks just below the cotton swab. Discard the sticks and transfer the cotton swabs to the vial labeled 'front'.

10.2.7. Using the same forceps as in Step 10.2.3, transfer the polyurethane foam plug from the front section of the tube to the vial labeled 'front'.

10.2.8. In similar fashion, transfer the XAD-2 sorbent and polyurethane foam plug from the rear section of the tube to a 20-mL glass vial labeled 'back'.

10.2.9. Carefully wipe the exterior of the empty sorbent tube with a tissue moistened with acetone. Discard the tissue and place the empty tube in the vial labeled 'front'.

10.2.10. Add 10.0 mL of the methanol/0.1 N sodium hydroxide (90:10) extraction solution to each of the vials labeled 'front' and 'back'.

10.2.11. Proceed to Section 10.4.

10.3. Sample Preparation when the Front and Back Sections are to be Analyzed Together

10.3.1. For recovery samples, fortify the sorbent tube by applying a 10-µL aliquot of the appropriate spiking solution to the sorbent using a 10-µL syringe. Pass the needle of the syringe through the glass fiber filter and inject the contents into the sorbent contained in the front section of the tube. Allow the solvent to evaporate for approximately 10 minutes prior to extraction.

10.3.2. Neutralize any static electricity on the sampling tube using an anti-static gun.

10.3.3. Using forceps, transfer the entire contents of the sorbent tube to a 20-mL glass vial.

10.3.4. Carefully wipe the exterior of the empty sorbent tube with a tissue moistened with acetone. Discard the tissue and place the empty tube in the vial.

10.3.5. Add 10.0 mL of the methanol/0.1 N sodium hydroxide (90:10) extraction solution to each of the vials.

10.3.6. Proceed to Section 10.4.

10.4. Sample Extraction

10.4.1. Cap the vial with a PTFE-lined cap and shake the sample for a minimum of 30 minutes on a reciprocating shaker at approximately 180 excursions/minute.

10.4.2. Centrifuge the sample vial for 5 minutes at 1000 rpm. Alternatively, the vial can set for a minimum of 1 hour to allow the solids to settle.

10.4.3. Transfer a 250-µL aliquot of the extraction solution to a 2-mL syringeless filter vial.

10.4.4. Pipet 250-µL of the internal standard solution containing 12.5 ng/mL of $^{13}C_6$-2,4-D into the

same vial. Gently swirl the vial to mix the contents.

10.4.5. Cap the filter vial with a cap/plunger assembly and compress the plunger until fully seated in the vial.

10.4.6. Analyze the samples and calibration standards by LC/MS/MS with negative-ion electrospray tandem mass spectrometry.

8.2. 2011 Sites

Product Safety Labs

ANALYTICAL METHOD

Author: Austin Xu Date: 2/15/2012

Method No: RA011 Version No: Original

1.0 SCOPE:

This is an analytical method for the determination of residues of (2, 4-Dichlorophenoxy) acetic acid in air sampling tubes with an LC-MS/MS detection and a method LOQ of 0.075 ppm.

2.0 PRINCIPLE:

The sample was extracted from the sorbent tubes with methanol/0.1 N sodium hydroxide (90:10) extraction solution. After mechanical shaking for 30 minutes, an aliquot was taken out and transferred to a 20 mL vial with a PTFE cap. After transferring to the 96 Filter Plate set into a vacuum manifold containing a 96 well plate and filtering, an aliquot of the internal standard solution was added to the filtered extraction solution which was then analyzed by LC/MS/MS.

3.0 EQUIPMENT AND SUPPLIES:

3.1 LC-MS/MS: Perkin Elmer (PE) HPLC series 200 with Applied Bio-System/Sciex (API) 4000 Tandem Mass Spectrometer.

3.2 Balance: Micro-balance, Mettler Toledo XP204-Analytical

3.3 Vortex : VWR VX-2500 Multi-Tube Vortexer

3.4 Shaker: Eberbach Reciprocal Shaker Model 6010

3.5 Static Gun: Zerostat 3 Milty

3.6 Bottle Top Dispenser: Beckman Dispenser (10mL), PN: IN3604

3.7 Glassware: Various Class A volumetric flask; Nat. Sci. 20mL vials with PTFE caps, Lot #: 00140266

3.8 Conical Tubes: Polypropylene 15 mL and 50 mL, BD Falcon Brand

3.9 Well Plates: Waters 2mL Well Plate #186001438; AcroPrep 96 Filter Plate (1mL), Lot #: A10756076; Porvair Sciences Vacuum Manifold, Lot #: 211152/07

3.10 Air Sampling Tubes: SKC Air Sampling Tube, XAD-2, Lot #: 7085

3.11 Pipettor: Eppendorf, fixed, adjustable, multi-channel and repeat pipettes.

3.12 Pipette Tips: Polypropylene, varied sizes, Fisher Brand or equivalent vendors.

3.13 General laboratory equipment.

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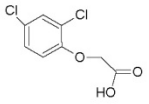
4.0 REFERENCE STANDARDS:

4.1 Analytical Reference Standard

The reference standard is identified with the following information:

Description	Structural Formula and Chemical Name
2, 4-D (2, 4-dichlorophenoxyacetic acid) CAS Number: 94-75-7 Molecular Formula: $C_8H_6Cl_2O_3$ Molecular Weight: 221.04	

Description	Analytical Reference Standard
	2, 4-D (2, 4-dichlorophenoxyacetic acid)
Dow Test Substance #	AGR275828
Dow Lot #	MORRIS/1710
PSL ID #	110929-15H
Purity (Wt %)	99.5%
Description	White Solid
Expiration Date	October 19, 2016
Storage Conditions	Ambient

4.2 Stable Isotope Internal Standard

The stable isotope internal standard is identified with the following information:

Description	Stable Isotope Internal Standard
	2, 4-D (Ring-$^{13}C_6$, 99%)
Cambridge Isotope Laboratories Cat. #:	CLM-1858-S
Cambridge Isotope Laboratories Lot #	SCHF-006
CAS #:	94-75-7
Molecular Weight:	226.99
PSL ID #	120223-10H
Purity (Wt %)	≥ 98%
Description	Clear Liquid
Expiration Date	January 24, 2013
Storage Conditions	Ambient

5.0 CHEMICALS, REAGENTS, AND BLANKS:

5.1 Water (H_2O): HPLC grade or equivalent.

5.2 Methanol (MeOH): HPLC grade or equivalent

5.3 Acetic Acid: Reagent grade (96% minimum) or equivalent.

5.4 0.02 N Hydrochloric Acid (HCl) solution

5.5 0.1 N Sodium Hydroxide (NaOH) solution

5.6 Mobile Phase A: HPLC water with 0.1% acetic acid.

5.7 Mobile Phase B: Methanol with 0.1% acetic acid.

6.0 PROCEDURE:

6.1 Preparation of Primary Stock Standard Solution

6.1.1 Weigh approximately 100mg of (2, 4-dichlorophenoxy) acetic acid analytical standard in a 100 mL volumetric flask. Dilute to volume with methanol to obtain a 1000 µg/mL stock solution.

6.2 Preparation of Fortification Solutions:

6.2.1 Transfer 50 mL of the 1000 µg/mL stock solution into a 200 mL volumetric flask and dilute to volume with methanol to obtain a 250 µg/mL solution.

6.2.2 Transfer 20 mL of the 250 µg/mL stock solution into a 200 mL volumetric flask and dilute to volume with methanol to obtain a 25 µg/mL solution.

6.2.3 Transfer 20 mL of the 25 µg/mL stock solution into a 200 mL volumetric flask and dilute to volume with methanol to obtain a 2.50 µg/mL solution.

6.2.4 Transfer 20 mL of the 2.50 µg/mL stock solution into a 200 mL volumetric flask and dilute to volume with methanol to obtain a 0.25 µg/mL solution.

6.3 Preparation of Spiking Solutions

6.3.1 Prepare spiking solutions by diluting the above fortification solutions with methanol as shown below:

Concentration of Stock Solution (µg/mL)	Aliquot of Stock Solution (mL)	Final Solution Volume (mL)	Spiking Solution Concentration (µg/mL)	Equivalent Sample Concentration[1] (µg/tube)
0.250	60.0	100	0.150	0.0015
2.50	20.0	100	0.500	0.0050
2.50	50.0	100	1.25	0.0125
25.0	20.0	100	5.00	0.0500
25.0	50.0	100	12.5	0.125
250.0	20.0	100	50.0	0.500
250.0	50.0	100	125.0	1.25

[1]The equivalent sample concentration is based on fortifying an air sampling tube with 10.0 µL of spiking solution.

6.4 Preparation of Stable-Isotope Internal Standard Solution

6.4.1 Transfer 50 µL of the 100 µg/mL $^{13}C_6$-(2, 4-dichlorophenoxy) acetic acid stable-isotope internal standard solution into a 10 mL volumetric flask. Dilute to volume with methanol to obtain a 0.500 µg/mL solution of $^{13}C_6$-(2, 4-dichlorophenoxy) acetic acid.

6.4.2 Transfer 250 µL of the 100 µg/mL $^{13}C_6$-(2, 4-dichlorophenoxy) acetic acid stable-isotope internal standard solution into a 2000 mL volumetric flask. Dilute to volume with 0.02 N hydrochloric acid to obtain a 12.5 ng/mL solution of $^{13}C_6$-(2, 4-dichlorophenoxy) acetic acid.

6.5 Preparation of Calibration Standards

6.5.1 All calibration standards shown below are diluted to volume with a methanol/water solution (40:60) containing 0.1% acetic acid:

Concentration of Spiking Solution (µg/mL)	Aliquot of Spiking Solution (µL)	Aliquot of 0.500 µg/mL Internal Standard Solution (µL)	Final Solution Volume (mL)	Calibration Solution Final Concentration (ng/mL)	Equivalent Sample Concentration[1] (µg/tube)
0.150	10.0	250	20.0	0.075	0.0015
0.250	10.0	250	20.0	0.125	0.0025
0.500	10.0	250	20.0	0.250	0.0050
1.25	10.0	250	20.0	0.625	0.0125
2.50	10.0	250	20.0	1.25	0.0250
5.00	10.0	250	20.0	2.50	0.0500
12.5	10.0	250	20.0	6.25	0.125
25.0	10.0	250	20.0	12.5	0.250
50.0	10.0	250	20.0	25.0	0.500

[1]The equivalent sample concentration is based on fortifying an air sampling tube with 10.0 µL of spiking solution.

7.0 SAMPLE PREPARATION:

7.1 For recovery samples, fortify the sorbent tubes by applying 10 µL of the appropriate spiking solution to the sorbent using a 10 µL syringe. Pass the needle of the syringe through the glass fiber filter and inject the contents into the sorbent contained in the front section of the tube. Allow to sorbent to evaporate for approximately 10 minutes prior to extraction.

7.2 Neutralize any static electricity on the sampling tube using an anti-static gun.

7.3 Using forceps, transfer the entire contents of the sorbent tube to a 50 mL polypropylene centrifuge tube.

7.4 Carefully wipe the exterior of the empty sorbent tube with a tissue moistened with acetone. Discard the tissue and place the empty sorbent tube into the 50 mL centrifuge tube.

7.5 Add 10 mL of the methanol/0.1 N sodium hydroxide (90:10) extraction solution to each of the centrifuge tubes.

7.6 Cap the tubes and shake the sample for a minimum of 30 minutes on a reciprocating shaker at approximately 180 excursions/minute.

7.7 Allow the extraction solution to settle for about 5 minutes and then transfer approximately 3mL into a 20 mL glass vial with a PTFE cap.

7.8 Transfer a 400 µL aliquot of the extraction solution to a 96 filter plate set into a vacuum manifold containing a 96 well plate. Gently increase vacuum to ensure complete filtration.

7.9 Pipet 400 µL of the internal standard solution containing 12.5 ng/mL of $^{13}C_6$-2, 4-D into the well plate after removal from the vacuum manifold.

7.10 Analyze the samples and calibration standards by LC/MS/MS detection.

8.0 INSTRUMENT CONDITIONS:

The following instrument conditions can be adjusted to optimize the instrument performance, at the discretion of study director.

8.1 HPLC: Perkin Elmer Series 200

8.2 MS: API 4000, Applied Bio-System

8.3 HPLC Conditions:

Column	Synergi Hydro-RP, 4.6 x 70mm, 4 µm
Mobile Phase	A: H_2O with 0.1% Acetic acid; B: Methanol with 0.1% Acetic acid
Injection Volume	30 µL
Column Temperature	40 °C
Analysis Time	Approximately 8 minutes
Flow Rate	1.0 mL/min
Retention Times (Target min.)	Approximately 6 minutes

HPLC Gradient:

Step	Total Time (min)	Flow Rate (µL/min)	Gradient Profile	% A	% B
0	0.0	1000	1.0	90	10
1	4.0	1000	1.0	0	100
2	5.5	1000	1.0	0	100
3	5.8	1000	1.0	90	10
4	8.0	1000	1.0	90	10

8.4 Mass Spectrometry Conditions:

Period 1

Ionization type	Turbo Ion Spray
Scan Type	MRM
Polarity	Negative
Resolution Q1/Q3	Unit/Unit
Curtain Gas	20
Nebulizer Gas (Gas1)	60
Turbo Gas (Gas2)	45
Ionization Voltage (V)	-4500

Temperature (°C)	500
Interface Heater	On
Collision Gas (CAD)	6.0
Entrance Potential (EP)	-8

2, 4-D

Quantitation Transitions	219.2/161.0
Dwell	150
Declustering Potential (DP)	-50
Entrance Potential	-8
Collision Energy (CE)	-18
Collision Exit Potential (CXP)	-13

Confirmation Transitions	221.2/163.0
Dwell	150
Declustering Potential (DP)	-50
Entrance Potential	-8
Collision Energy (CE)	-18
Collision Exit Potential (CXP)	-13

2, 4-D (M+6 ISTD)

Quantitation Transitions	225.2/167.0
Dwell	150
Declustering Potential (DP)	-50
Entrance Potential	-8
Collision Energy (CE)	-18
Collision Exit Potential (CXP)	-13

9.0 CALCULATIONS:

9.1 Set up the appropriate integration method with the Analyst® 1.4.2 software.

9.2 Integrate all the peaks of interest, including standard, QCs and samples.

9.3 Using the Analyst® 1.4.2 software for regression, construct the standard curve of peak area or peak area ratios versus the concentration of standards.

9.4 Linear or weighted linear regression can be used.

9.5 Using the standard curve parameters and the integration of the peaks of interest from all the samples except standards calculate the concentrations of each sample.

10.0 ACCEPTANCE CRITERIA:

10.1 Standard Curve:

10.1.1 The linearity indicated by % nominal of calibration standards is calculated as follows:

% Nominal= [(calculated concentration)/(nominal concentration)] x100%

10.1.2 The percent nominal for all the standard points should be within 100±15%,

except the lowest standard point, which should be 100±20%.

10.1.3 One point from the standard curve may be eliminated in constructing standard curve, but it should not be at the highest or lowest concentration. Thus, at least, 5 points must be retained.

10.1.4 The correlation coefficient of calibration curve [r] should be 0.99 or greater.

10.2 Result Reporting:

10.2.1 If the concentration detected from the unknown sample is within the range of the calibration curve, then the actual value calculated will be reported.

10.2.2 If the concentration detected from the unknown sample is greater than the highest standard curve point, then the sample will be diluted and re-analyzed upon the client's request, or a reference value calculated by that calibration curve will be issued.

10.2.3 If the concentration detected from the unknown sample is lower than the lowest standard curve point, then <LOQ will be reported. We can report values that are <LOQ by client's request.

10.2.4 If there is no peak detected in the unknown sample, then ND is reported.

11.0 NOTES:

11.1 All the numbers in this method are rounded numbers and the actual numbers should be documented rounding to 3 significant numbers where applicable.

11.2 The preparation schemes are suggested schemes and can be modified accordingly. The actual used scheme should be documented.

11.3 Criteria other than those listed in the method can be used, provided there is written authorization from sponsor, study investigator or management.

11.4 Equivalent equipment and reagents can be used as substitutes to those listed in the method, unless otherwise stated.

12.0 REPRESENTATION MRM AND OTHER FIGURES:

Figure 1. Spectrum of Q1 Scan of 2, 4-Dichlorophenoxyacetic acid
Figure 2. Spectrum of MS2 Scan of 2, 4-Dichlorophenoxyacetic acid Quantitation Ion
Figure 3. Spectrum of MS2 Scan of 2, 4-Dichlorophenoxyacetic acid Confirmation Ion
Figure 4. Spectrum of Q1 Scan of $^{13}C_6$-2, 4-D (Internal Standard)
Figure 5. Spectrum of MS2 Scan of $^{13}C_6$-2, 4-D (Internal Standard)
Figure 6. Representative MRM Chromatogram of 2, 4-Dichlorophenoxyacetic acid (Quantitation Ion; Std 1: 0.075 ng/mL)
Figure 7. Representative MRM Chromatogram of 2, 4-Dichlorophenoxyacetic acid (Confirmation Ion; Std 1: 0.075 ng/mL)
Figure 8. Representative MRM Chromatogram of $^{13}C_6$-2, 4-D (Internal Standard) (Internal Standard: 6.25 ng/mL)
Figure 9. Representative MRM Chromatogram of 2, 4-Dichlorophenoxyacetic acid (Quantitation Ion; Std 10: 50 ng/mL)
Figure 10. Representative MRM Chromatogram of 2, 4-Dichlorophenoxyacetic acid (Confirmation Ion; Std 10: 50 ng/mL)
Figure 11. Typical Standard Curve for 2, 4-Dichlorophenoxyacetic acid

FIGURE 1: SPECTRUM OF Q1 SCAN OF 2, 4-D

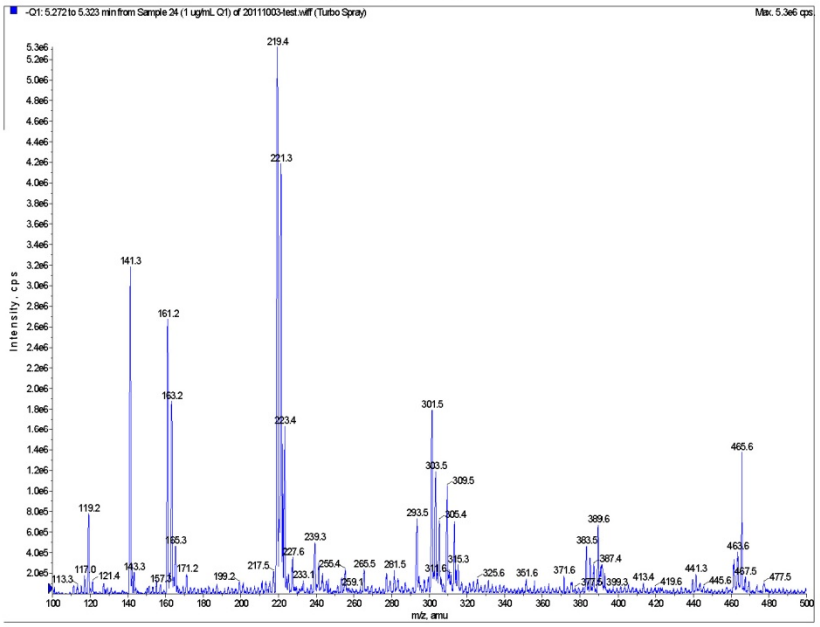


FIGURE 2: SPECTRUM OF MS2 SCAN OF 2, 4-D QUANTITATION ION

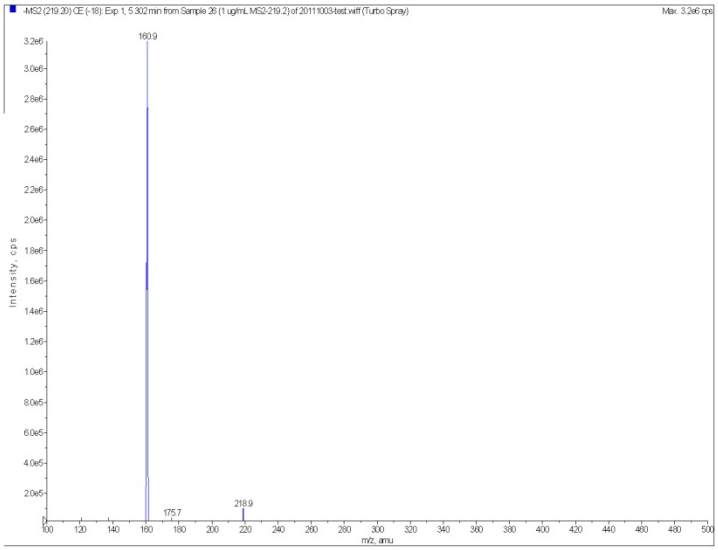


FIGURE 3: SPECTRUM OF MS2 SCAN OF 2, 4-D CONFIRMATION ION

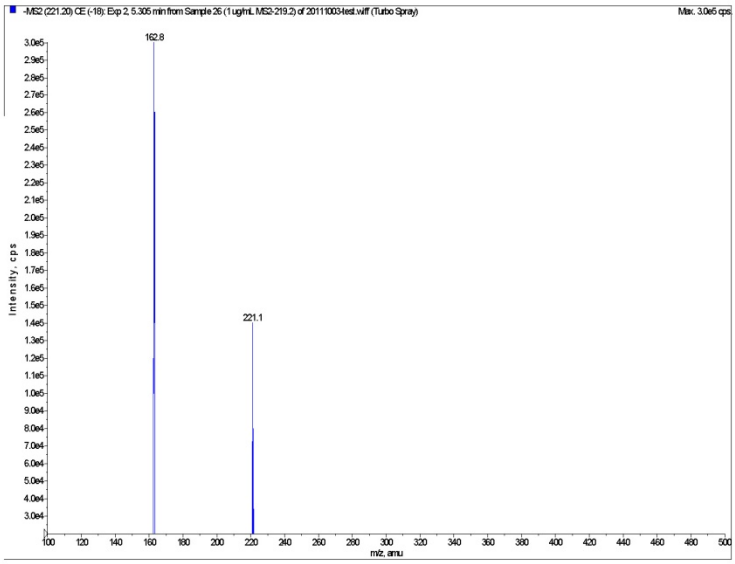


FIGURE 4: SPECTRUM OF Q1 SCAN OF $^{13}C_6$-2, 4-D (INTERNAL STANDARD)

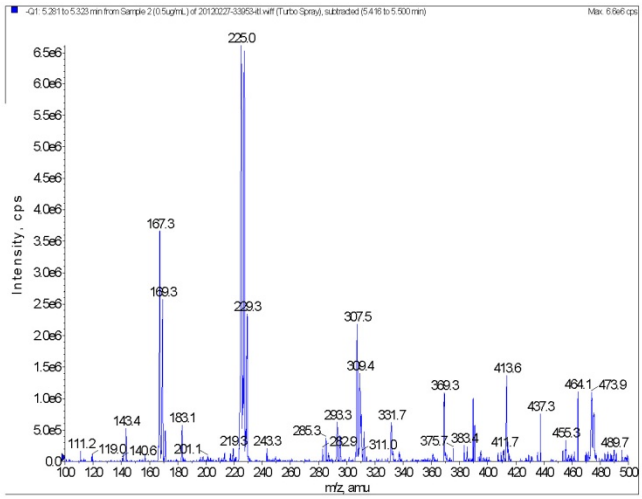


FIGURE 5: SPECTRUM OF MS2 SCAN OF $^{13}C_6$-2, 4-D (INTERNAL STANDARD)

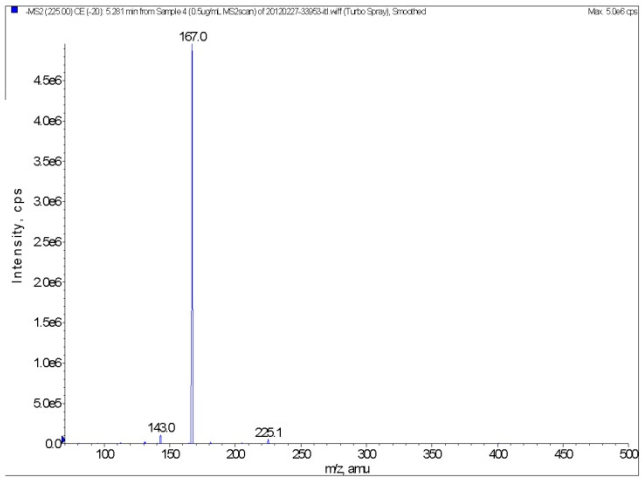


FIGURE 6: REPRESENTATIVE MRM CHROMATOGRAM OF 2, 4-D (QUANTITATION ION; STD 1: 0.075 NG/ML)

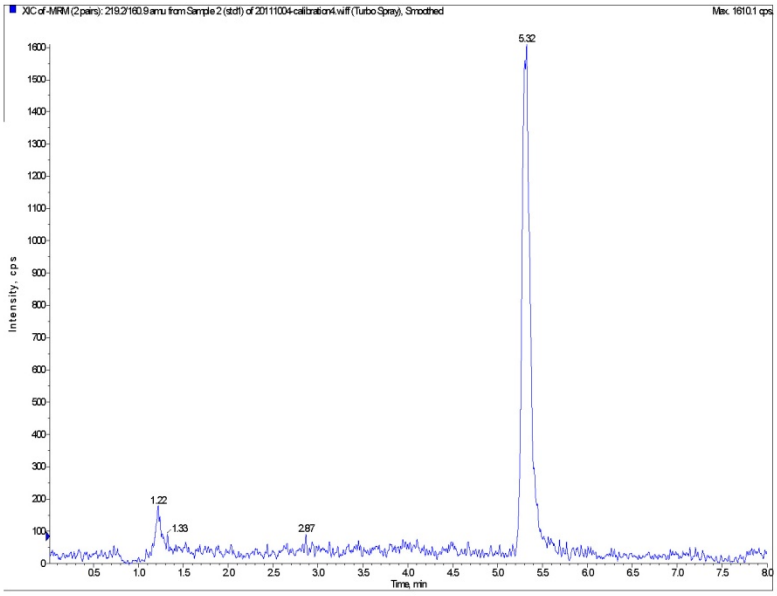


FIGURE 7: REPRESENTATIVE MRM CHROMATOGRAM OF 2, 4-D (CONFIRMATION ION; STD 1: 0.075 NG/ML)

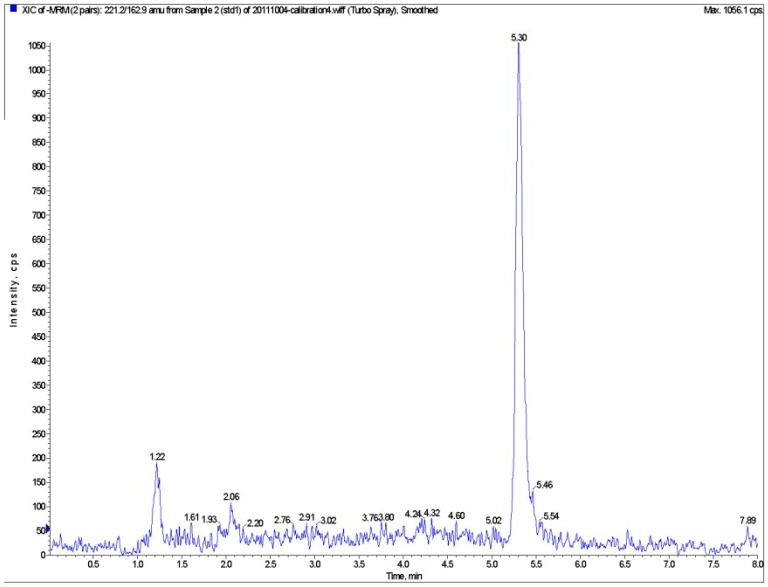


FIGURE 8: REPRESENTATIVE MRM CHROMATOGRAM OF $^{13}C_6$-2, 4-D (INTERNAL STANDARD: 6.25 NG/ML)

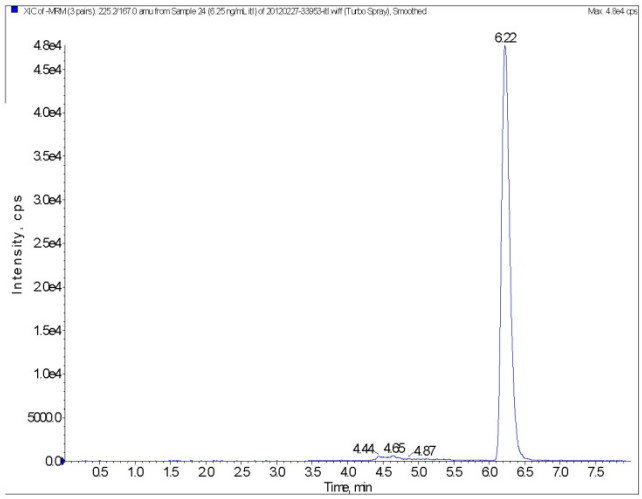


FIGURE 9: REPRESENTATIVE MRM CHROMATOGRAM OF 2, 4-D (QUANTITATION ION; STD 10: 50 NG/ML)

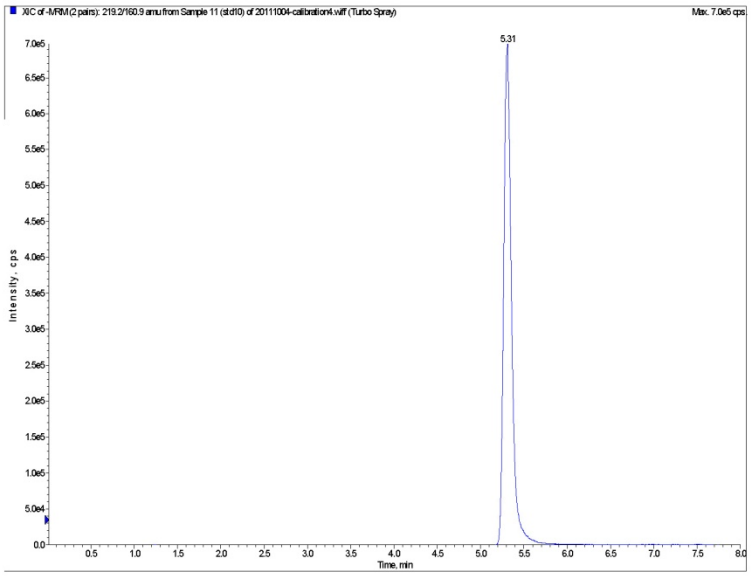


FIGURE 10: REPRESENTATIVE MRM CHROMATOGRAM OF 2, 4-D (CONFIRMATION ION; STD 10: 50 NG/ML)

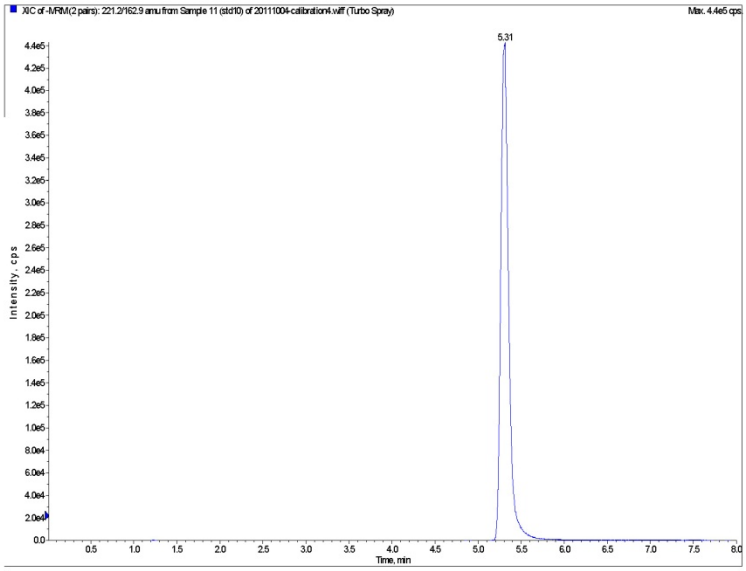
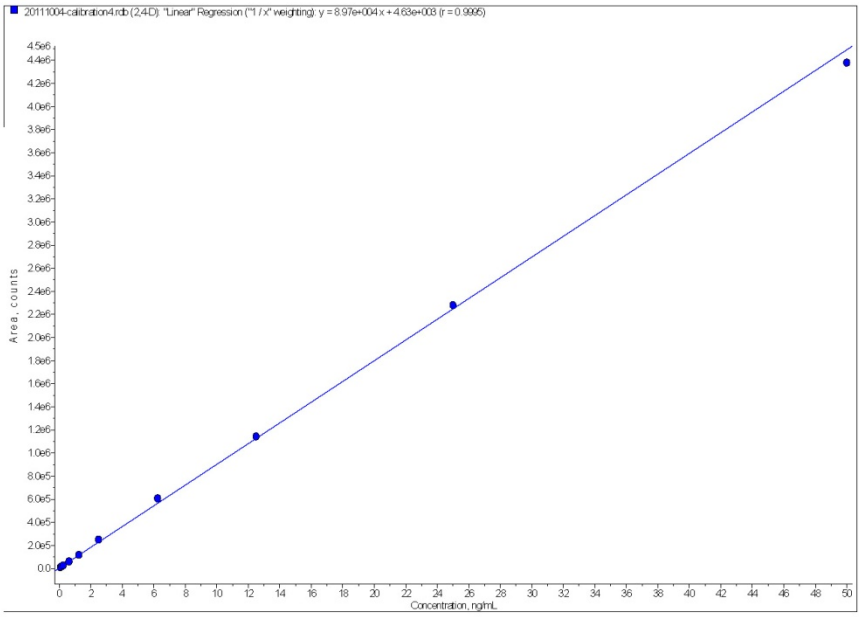


FIGURE 11: TYPICAL STANDARD CURBE FOR 2, 4-D



9. APPENDIX B – WEATHER RECORDS

Hourly average weather values, formatted as ISCST-3 meteorological input files, are shown here; complete weather records and processing steps are included in supplemental data files submitted electronically.

9.1. Farmland, IN

Year	Month	Day	Hour	Wind direction (degrees)	Wind velocity (m/s)	Temperature (K)	Stability Class (A=1, B=2, ... F=6)
10	8	2	11	320.9493	1.0039	301.3	1
10	8	2	12	17.4173	1.0934	301.4	2
10	8	2	13	26.4016	1.2464	302.5	1
10	8	2	14	55.8540	1.4831	302.5	2
10	8	2	15	73.2194	1.0039	303.2	2
10	8	2	16	36.9054	1.0513	303.9	2
10	8	2	17	44.0088	1.1866	303.5	2
10	8	2	18	35.2997	1.1638	303.0	3
10	8	2	19	23.6997	1.0602	302.9	5
10	8	2	20	343.6010	0.7624	301.5	5
10	8	2	21	305.9679	0.3584	298.6	5
10	8	2	22	290.8611	0.7590	297.1	5
10	8	2	23	314.5979	0.8859	297.5	5
10	8	2	24	344.6243	0.8329	297.3	5
10	8	3	1	350.7549	0.6422	296.9	5
10	8	3	2	11.3243	0.4287	296.4	5
10	8	3	3	103.8519	0.6271	296.2	5
10	8	3	4	307.2481	0.6435	295.9	5
10	8	3	5	280.4186	0.5151	295.5	5

Year	Month	Day	Hour	Wind direction (degrees)	Wind velocity (m/s)	Temperature (K)	Stability Class (A=1, B=2, ... F=6)
10	8	3	6	359.2882	0.6685	295.5	5
10	8	3	7	18.4130	0.7139	296.0	4
10	8	3	8	345.7807	0.4024	295.9	4
10	8	3	9	7.7805	0.7756	296.5	4
10	8	3	10	70.3877	1.3586	296.9	4
10	8	3	11	67.9554	1.2426	296.5	4
10	8	3	12	7.3000	1.0199	296.8	3
10	8	3	13	23.1372	1.6940	299.0	3
10	8	3	14	7.0289	2.2297	300.9	3
10	8	3	15	2.2830	2.3073	301.8	3
10	8	3	16	10.6745	1.6533	300.8	3
10	8	3	17	18.4695	1.7821	301.5	3
10	8	3	18	16.8797	1.5336	302.3	3
10	8	3	19	24.2121	1.1072	302.5	5
10	8	3	20	351.0106	0.5697	302.5	5
10	8	3	21	344.8399	0.4589	301.2	5
10	8	3	22	345.2630	0.4853	300.3	5
10	8	3	23	326.1955	0.6862	299.8	5
10	8	3	24	339.8558	0.8201	299.5	5
10	8	4	1	72.6426	1.2349	299.6	5
10	8	4	2	62.4596	1.4490	299.0	5
10	8	4	3	65.4329	1.1320	297.0	5
10	8	4	4	58.6451	1.1503	297.0	5
10	8	4	5	90.0022	0.8596	297.3	5
10	8	4	6	286.0167	0.8237	295.9	5
10	8	4	7	273.3387	0.9017	295.9	4
10	8	4	8	323.0539	0.5360	296.7	4
10	8	4	9	19.0591	0.7403	298.8	4
10	8	4	10	80.3794	1.3333	300.4	4
10	8	4	11	112.0453	2.1613	300.8	3
10	8	4	12	127.1160	3.8592	300.0	3

Year	Month	Day	Hour	Wind direction (degrees)	Wind velocity (m/s)	Temperature (K)	Stability Class (A=1, B=2, ... F=6)
10	8	4	13	195.0676	2.0096	295.9	3
10	8	4	14	240.0007	1.1465	299.4	2
10	8	4	15	299.9589	1.0993	302.0	1
10	8	4	16	348.8194	1.1227	303.9	1
10	8	4	17	11.4797	1.1606	304.7	2
10	8	4	18	9.0328	1.1826	305.0	3
10	8	4	19	54.9146	0.9291	305.3	5
10	8	4	20	236.9821	0.7069	301.5	5
10	8	4	21	124.7919	3.1464	296.2	4
10	8	4	22	209.6631	1.1216	294.6	5
10	8	4	23	355.8643	1.0750	294.5	5
10	8	4	24	37.4195	0.7564	294.6	5
10	8	5	1	345.5745	0.3172	294.5	5
10	8	5	2	49.0913	0.6453	294.6	5
10	8	5	3	47.4157	0.9205	294.7	5
10	8	5	4	82.4415	0.7558	294.6	6
10	8	5	5	70.9138	0.8036	294.7	5
10	8	5	6	69.0606	0.8281	294.7	5
10	8	5	7	93.1385	1.0669	294.9	4
10	8	5	8	132.6894	1.3728	295.0	4
10	8	5	9	132.0423	1.7864	295.6	4
10	8	5	10	130.5234	1.7421	296.8	3
10	8	5	11	116.6841	1.7137	298.5	3
10	8	5	12	110.3717	2.1474	299.7	2
10	8	5	13	100.8991	1.8966	300.9	2
10	8	5	14	114.5338	2.8683	301.2	2
10	8	5	15	109.9051	3.1360	301.7	2
10	8	5	16	109.2039	3.1247	302.0	2
10	8	5	17	110.4007	3.1558	302.0	3
10	8	5	18	105.6974	2.6784	301.7	3
10	8	5	19	82.6782	2.4011	301.5	4

Year	Month	Day	Hour	Wind direction (degrees)	Wind velocity (m/s)	Temperature (K)	Stability Class (A=1, B=2, ... F=6)
10	8	5	20	80.3528	1.7452	300.3	5
10	8	5	21	100.7029	1.7897	298.7	5
10	8	5	22	150.7844	2.0355	296.7	4
10	8	5	23	129.3018	0.9129	294.5	5
10	8	5	24	116.0703	0.3092	293.0	5
10	8	6	1	50.9601	0.5297	292.6	5
10	8	6	2	40.8751	0.7442	292.0	5
10	8	6	3	56.5163	0.6782	291.6	5
10	8	6	4	66.0479	0.6664	291.3	5
10	8	6	5	64.2998	0.5217	290.7	5
10	8	6	6	68.5025	0.5700	290.3	5
10	8	6	7	55.7142	0.8250	289.9	4
10	8	6	8	81.7793	0.9731	290.7	4
10	8	6	9	116.3272	1.3647	292.5	2
10	8	6	10	136.9732	1.7602	294.7	3
10	8	6	11	155.8888	2.2336	296.5	3
10	8	6	12	146.6629	2.1412	297.7	2
10	8	6	13	112.4951	2.1478	298.4	2
10	8	6	14	118.2947	2.6641	298.7	2
10	8	6	15	121.8036	2.5313	298.9	2
10	8	6	16	121.2406	2.4646	299.1	2
10	8	6	17	112.1722	2.8901	299.1	2
10	8	6	18	119.0803	3.1918	298.8	3
10	8	6	19	129.6981	3.1213	298.2	4
10	8	6	20	133.6317	2.3139	297.2	4
10	8	6	21	118.9143	0.8113	294.6	5
10	8	6	22	92.7017	0.2457	292.1	5
10	8	6	23	16.4253	0.2553	290.7	5
10	8	6	24	347.9671	0.3183	290.0	5
10	8	7	1	344.0160	0.4408	289.4	5
10	8	7	2	343.7289	0.2967	288.9	5

Year	Month	Day	Hour	Wind direction (degrees)	Wind velocity (m/s)	Temperature (K)	Stability Class (A=1, B=2, ... F=6)
10	8	7	3	287.9751	0.4948	288.3	5
10	8	7	4	9.4579	0.5032	288.1	5
10	8	7	5	304.4368	0.3374	287.5	5
10	8	7	6	344.2113	0.4739	287.4	5
10	8	7	7	282.3669	0.4905	287.1	4
10	8	7	8	301.4218	0.3851	288.4	4
10	8	7	9	12.0520	0.6050	291.9	2
10	8	7	10	11.8226	0.8234	294.9	2
10	8	7	11	7.0548	1.1864	297.0	2
10	8	7	12	25.2433	1.2492	298.4	1
10	8	7	13	36.0531	1.3304	299.3	1
10	8	7	14	4.2308	1.2434	300.0	1
10	8	7	15	62.4750	1.3797	300.4	1
10	8	7	16	74.7236	1.2993	300.6	2
10	8	7	17	61.0063	1.2931	300.7	2
10	8	7	18	60.1085	1.2747	300.6	3
10	8	7	19	67.6977	1.1143	300.3	5
10	8	7	20	20.5543	0.5619	299.3	5
10	8	7	21	300.4401	0.3942	295.9	5
10	8	7	22	273.6890	0.5560	293.0	5
10	8	7	23	283.7956	0.5469	292.1	5
10	8	7	24	282.6673	0.5993	291.3	5
10	8	8	1	277.4169	0.4872	290.7	5
10	8	8	2	265.2643	0.5789	290.4	5
10	8	8	3	357.2626	0.4687	290.3	5
10	8	8	4	343.0920	0.3624	290.0	5
10	8	8	5	358.0161	0.3398	289.5	5
10	8	8	6	5.9344	0.5372	289.9	5
10	8	8	7	347.4016	0.4020	289.5	4
10	8	8	8	336.9147	0.5466	291.0	4
10	8	8	9	20.5501	0.8448	294.1	2

Year	Month	Day	Hour	Wind direction (degrees)	Wind velocity (m/s)	Temperature (K)	Stability Class (A=1, B=2, ... F=6)
10	8	8	10	32.6914	1.3237	296.8	3
10	8	8	11	31.1931	1.6107	298.9	3
10	8	8	12	33.4192	1.9155	300.1	2
10	8	8	13	25.3626	1.8983	301.1	2
10	8	8	14	37.9526	2.0581	301.0	3
10	8	8	15	26.7097	1.8522	300.8	3
10	8	8	16	36.2748	1.8861	301.3	3
10	8	8	17	20.2904	1.4158	301.3	3
10	8	8	18	11.6254	1.0518	301.5	3
10	8	8	19	354.9086	0.7136	301.9	5
10	8	8	20	308.0837	0.3561	300.8	5
10	8	8	21	315.5660	0.4122	298.0	5
10	8	8	22	277.9133	0.5166	295.2	5
10	8	8	23	295.0970	0.5918	294.5	5
10	8	8	24	263.9217	0.3998	293.1	5
10	8	9	1	341.5240	0.5630	293.5	5
10	8	9	2	351.3629	0.8352	293.9	5
10	8	9	3	357.3018	0.7392	293.6	5
10	8	9	4	353.9738	0.5253	293.0	5
10	8	9	5	5.1737	0.6519	292.9	5
10	8	9	6	351.1294	0.6171	292.7	5
10	8	9	7	294.6945	0.5605	291.8	4
10	8	9	8	308.7549	0.4447	292.2	4
10	8	9	9	0.1419	0.7419	294.4	3
10	8	9	10	7.3567	1.0633	298.3	2
10	8	9	11	31.9402	1.7332	300.5	3
10	8	9	12	45.6871	1.6516	302.1	2
10	8	9	13	53.2809	1.4469	303.1	2
10	8	9	14	58.9692	1.8738	304.1	2
10	8	9	15	45.9531	1.6133	304.9	2
10	8	9	16	20.4020	1.0270	304.2	2

Year	Month	Day	Hour	Wind direction (degrees)	Wind velocity (m/s)	Temperature (K)	Stability Class (A=1, B=2, ... F=6)
10	8	9	17	12.3047	1.1342	304.4	2
10	8	9	18	23.6895	1.3039	304.0	3
10	8	9	19	339.0201	0.4566	303.3	5
10	8	9	20	298.9744	0.2293	302.8	5
10	8	9	21	359.3026	0.1814	300.9	6
10	8	9	22	355.0529	0.2447	299.5	4
10	8	9	23	354.4410	0.5391	299.1	4
10	8	9	24	355.7430	0.4235	298.7	4
10	8	10	1	12.0949	0.5946	298.6	5
10	8	10	2	286.4400	0.3751	297.8	5
10	8	10	3	291.4868	0.4488	296.6	5
10	8	10	4	299.9040	0.2915	295.7	5
10	8	10	5	317.0489	0.4537	295.1	5
10	8	10	6	299.5213	0.4048	294.8	5
10	8	10	7	306.1989	0.5097	294.6	4
10	8	10	8	285.3977	0.4757	295.4	4
10	8	10	9	213.7645	0.4502	297.2	4

9.2. Fowler, IN

Year	Month	Day	Hour	Wind direction (degrees)	Wind velocity (m/s)	Temperature (K)	Stability Class (A=1, B=2, ... F=6)
10	9	7	12	65.7341	5.8044	297.1	4
10	9	7	13	56.8320	6.3935	298.6	4
10	9	7	14	67.4431	7.4322	299.4	4
10	9	7	15	62.5979	8.4608	300.3	4
10	9	7	16	57.2250	8.9543	300.8	4
10	9	7	17	60.6923	9.7871	300.3	4

Year	Month	Day	Hour	Wind direction (degrees)	Wind velocity (m/s)	Temperature (K)	Stability Class (A=1, B=2, ... F=6)
10	9	7	18	66.5517	8.8393	300.1	4
10	9	7	19	73.3035	7.8014	299.5	4
10	9	7	20	84.1013	6.0141	297.6	4
10	9	7	21	92.3671	2.6050	293.2	4
10	9	7	22	106.7268	2.7106	290.8	4
10	9	7	23	95.9910	2.2169	289.4	4
10	9	7	24	102.1528	3.1909	289.3	4
10	9	8	1	103.3682	2.5408	287.8	4
10	9	8	2	104.4720	2.3594	286.7	4
10	9	8	3	100.7504	2.7375	286.2	4
10	9	8	4	100.6326	2.1910	285.5	4
10	9	8	5	107.4184	1.9319	285.5	5
10	9	8	6	129.6413	1.8534	286.1	5
10	9	8	7	68.6765	1.2055	283.1	4
10	9	8	8	82.9093	1.3648	282.2	4
10	9	8	9	109.1497	1.9398	285.0	3
10	9	8	10	139.5104	2.6509	288.7	3
10	9	8	11	137.4922	3.1520	290.9	3
10	9	8	12	130.4499	3.7169	292.1	3
10	9	8	13	104.7823	3.9844	293.4	2
10	9	8	14	103.6362	4.3492	294.7	3
10	9	8	15	100.9373	4.4437	296.0	3
10	9	8	16	113.4655	4.3651	296.9	3
10	9	8	17	117.6825	3.9776	297.3	3
10	9	8	18	123.8303	3.4500	297.5	4
10	9	8	19	139.4217	3.0189	296.9	4
10	9	8	20	159.1038	1.8602	295.2	5
10	9	8	21	178.2453	1.1631	291.7	5
10	9	8	22	209.4874	1.9218	289.4	5
10	9	8	23	230.1805	1.9224	287.5	4
10	9	8	24	224.2432	1.9061	286.5	4

Year	Month	Day	Hour	Wind direction (degrees)	Wind velocity (m/s)	Temperature (K)	Stability Class (A=1, B=2, ... F=6)
10	9	9	1	225.8539	1.9148	285.6	5
10	9	9	2	230.3117	1.1691	284.5	5
10	9	9	3	229.6407	0.9734	283.4	5
10	9	9	4	249.4862	1.0205	282.7	5
10	9	9	5	64.5968	0.6949	281.3	5
10	9	9	6	131.0388	0.5613	280.6	5
10	9	9	7	5.3062	0.4912	280.0	4
10	9	9	8	64.0745	0.5325	280.1	4
10	9	9	9	346.2480	0.5685	284.3	3
10	9	9	10	359.6932	1.9275	286.9	3
10	9	9	11	329.2167	2.2495	289.3	3
10	9	9	12	277.4368	2.2660	291.4	2
10	9	9	13	251.5981	2.1491	292.7	2
10	9	9	14	230.5558	1.8031	294.0	2
10	9	9	15	242.7327	2.1300	295.2	2
10	9	9	16	231.6763	1.6141	296.3	1
10	9	9	17	281.1129	2.0003	296.7	2
10	9	9	18	248.0852	1.9802	297.0	5
10	9	9	19	256.9737	1.8967	296.8	5
10	9	9	20	239.6538	1.9131	295.0	5
10	9	9	21	212.9437	1.6454	291.6	5
10	9	9	22	213.2594	2.7316	289.6	4
10	9	9	23	214.7003	2.5583	288.6	4
10	9	9	24	224.6492	1.7880	287.5	5
10	9	10	1	227.5257	1.9134	286.8	5
10	9	10	2	232.6913	1.8635	286.1	5
10	9	10	3	236.1032	1.7814	285.4	5
10	9	10	4	230.1943	1.8122	284.9	4
10	9	10	5	233.9775	2.1186	284.6	4
10	9	10	6	250.5303	2.6384	285.1	4
10	9	10	7	258.9432	2.2517	284.9	4

Year	Month	Day	Hour	Wind direction (degrees)	Wind velocity (m/s)	Temperature (K)	Stability Class (A=1, B=2, ... F=6)
10	9	10	8	253.0351	2.3494	284.5	4
10	9	10	9	258.7360	2.8875	286.6	4
10	9	10	10	288.2729	3.9323	289.4	3
10	9	10	11	297.5652	4.3372	291.7	3
10	9	10	12	290.6070	4.5686	294.1	3
10	9	10	13	295.5883	4.4104	295.9	3
10	9	10	14	299.2459	4.3718	297.3	3
10	9	10	15	293.0504	4.2830	298.6	3
10	9	10	16	296.9600	3.8841	299.5	2
10	9	10	17	302.0552	3.7598	299.9	3
10	9	10	18	303.1913	3.4629	299.5	4
10	9	10	19	297.4936	3.6383	299.2	4
10	9	10	20	262.3399	3.1541	297.6	4
10	9	10	21	257.4259	3.3428	295.5	4
10	9	10	22	298.3037	2.6036	293.6	5
10	9	10	23	287.2529	1.5756	292.2	6
10	9	10	24	270.5895	1.6293	292.1	4
10	9	11	1	270.9972	2.0777	292.1	4
10	9	11	2	270.8242	2.5910	292.3	4
10	9	11	3	257.1468	3.6427	291.7	4
10	9	11	4	272.5888	4.0276	291.4	4
10	9	11	5	279.9812	3.6210	291.2	4
10	9	11	6	285.0325	3.3499	291.1	5
10	9	11	7	286.7496	2.7672	288.8	4
10	9	11	8	280.8437	2.0612	288.0	4
10	9	11	9	280.0580	2.9465	288.4	4
10	9	11	10	278.6294	3.1092	288.5	4
10	9	11	11	307.6927	2.3819	288.8	4
10	9	11	12	331.7515	2.5089	289.4	4
10	9	11	13	358.3727	3.3725	291.2	4
10	9	11	14	47.0424	3.6258	292.9	3

Year	Month	Day	Hour	Wind direction (degrees)	Wind velocity (m/s)	Temperature (K)	Stability Class (A=1, B=2, ... F=6)
10	9	11	15	96.5727	3.9196	293.5	4
10	9	11	16	101.0314	5.6147	293.7	4
10	9	11	17	99.9785	5.7264	294.6	4
10	9	11	18	105.2515	5.5626	295.8	4
10	9	11	19	120.1244	2.9165	297.0	4
10	9	11	20	113.9748	2.0114	296.3	5
10	9	11	21	84.5372	1.0549	292.1	5
10	9	11	22	103.4683	3.0988	292.2	4
10	9	11	23	109.7298	3.2559	291.8	4
10	9	11	24	102.2335	2.1667	289.3	4
10	9	12	1	89.9075	1.3765	286.7	5
10	9	12	2	94.4350	1.5276	285.3	4
10	9	12	3	90.4998	1.3822	284.8	4
10	9	12	4	96.5749	1.4522	284.4	5
10	9	12	5	93.0515	2.0945	284.7	4
10	9	12	6	99.9592	1.6220	283.9	4
10	9	12	7	38.4497	1.0817	283.0	4
10	9	12	8	53.7313	0.9337	282.5	4
10	9	12	9	91.9796	1.1649	285.2	3
10	9	12	10	96.5244	1.6410	289.8	2
10	9	12	11	111.8616	1.9515	293.5	3
10	9	12	12	110.4555	2.0912	296.7	2
10	9	12	13	101.7760	4.0329	297.9	3
10	9	12	14	111.5268	4.6518	299.1	3
10	9	12	15	104.9167	4.4670	300.2	3
10	9	12	16	115.4946	4.4359	301.1	3
10	9	12	17	103.3812	4.6824	301.4	4
10	9	12	18	103.1051	3.6574	301.5	4
10	9	12	19	82.7501	3.4763	301.0	4
10	9	12	20	65.3363	2.1560	298.7	4
10	9	12	21	33.0745	1.8005	293.8	4

Year	Month	Day	Hour	Wind direction (degrees)	Wind velocity (m/s)	Temperature (K)	Stability Class (A=1, B=2, ... F=6)
10	9	12	22	39.3433	1.2547	290.5	4
10	9	12	23	48.9943	0.9240	289.6	5
10	9	12	24	65.4929	0.9591	288.4	5
10	9	13	1	43.0079	1.7460	288.6	4
10	9	13	2	46.4604	1.7124	289.6	4
10	9	13	3	33.1793	1.7544	288.4	4
10	9	13	4	37.5348	1.7362	287.8	4
10	9	13	5	34.5949	1.5333	287.8	4
10	9	13	6	44.2205	1.1738	288.3	5
10	9	13	7	81.3064	2.7868	290.2	4
10	9	13	8	61.3744	1.9692	289.0	4
10	9	13	9	42.6870	2.1678	289.2	4

9.3. Little Rock, AR

Year	Month	Day	Hour	Wind direction (degrees)	Wind velocity (m/s)	Temperature (K)	Stability Class (A=1, B=2, ... F=6)
11	7	12	7	0.0745	1.5225	299.5	11
11	7	12	8	18.2871	1.6754	301.2	11
11	7	12	9	32.2927	1.9668	303.7	11
11	7	12	10	42.4481	2.3618	305.6	11
11	7	12	11	63.1139	2.4779	307.7	11
11	7	12	12	26.4807	1.8078	309.5	11
11	7	12	13	337.9397	2.7171	309.5	11
11	7	12	14	344.3312	2.4956	310.5	11
11	7	12	15	335.9698	2.4787	311.0	11
11	7	12	16	328.8177	2.4977	311.1	11
11	7	12	17	327.1607	2.7204	310.6	11

11	7	12	18	328.8614	3.2742	310.0	11
11	7	12	19	331.5727	3.1563	309.0	11
11	7	12	20	338.0354	3.6347	307.4	11
11	7	12	21	332.4146	2.3260	305.1	11
11	7	12	22	344.4218	1.3950	303.7	11
11	7	12	23	343.1596	1.3671	302.8	11
11	7	12	24	4.2451	1.2832	302.3	11
11	7	13	1	341.0081	0.9690	301.8	11
11	7	13	2	0.7567	0.9381	301.4	11
11	7	13	3	354.2556	1.5541	300.4	11
11	7	13	4	6.6265	1.1000	300.2	11
11	7	13	5	357.5037	0.7098	299.9	11
11	7	13	6	359.5478	0.8975	299.5	11
11	7	13	7	182.9427	1.4831	299.7	11
11	7	13	8	266.0203	0.9415	301.2	11
11	7	13	9	226.7617	2.1984	302.9	11
11	7	13	10	227.3542	3.8653	303.5	11
11	7	13	11	219.5969	3.6153	303.4	11
11	7	13	12	202.9166	2.6910	302.6	11
11	7	13	13	216.9651	2.4478	304.3	11
11	7	13	14	264.7688	2.5565	305.9	11
11	7	13	15	286.6373	2.5039	307.0	11
11	7	13	16	251.9459	2.4943	307.3	11
11	7	13	17	207.4027	2.8514	306.7	11
11	7	13	18	104.9747	3.3972	304.5	11
11	7	13	19	194.8626	4.9975	299.1	11
11	7	13	20	309.8878	2.1221	298.2	11
11	7	13	21	347.1204	2.1054	298.8	11
11	7	13	22	276.7955	1.3125	298.7	11
11	7	13	23	235.7875	1.5352	298.3	11
11	7	13	24	310.9006	0.9683	298.0	11
11	7	14	1	350.7139	2.6603	298.1	11
11	7	14	2	54.6971	1.3912	297.7	11

11	7	14	3	86.2150	1.7916	297.6	11
11	7	14	4	120.3261	2.2140	297.7	11
11	7	14	5	124.0552	1.7479	297.7	11
11	7	14	6	144.3226	1.6261	297.6	11
11	7	14	7	222.9893	1.4552	297.6	11
11	7	14	8	216.5652	2.3757	298.3	11
11	7	14	9	221.4209	1.8622	298.5	11
11	7	14	10	19.4115	0.8100	299.3	11
11	7	14	11	341.8641	1.2365	300.1	11
11	7	14	12	9.1827	1.8078	300.7	11
11	7	14	13	41.0005	2.4809	301.4	11
11	7	14	14	11.0330	2.3555	302.8	11
11	7	14	15	18.1565	2.7172	304.4	11
11	7	14	16	27.9424	2.7553	303.9	11
11	7	14	17	353.6800	1.9161	304.5	11
11	7	14	18	338.9299	2.1648	304.7	11
11	7	14	19	337.1724	1.2482	303.9	11
11	7	14	20	298.5313	1.5801	303.6	11
11	7	14	21	305.9568	1.3019	302.6	11
11	7	14	22	258.3216	2.1792	302.2	11
11	7	14	23	293.4204	1.7775	301.1	11
11	7	14	24	320.6572	0.5882	300.5	11
11	7	15	1	191.9922	0.5355	300.6	11
11	7	15	2	235.4520	0.7504	300.1	11
11	7	15	3	204.2912	0.6233	299.9	11
11	7	15	4	184.6856	0.9321	299.4	11
11	7	15	5	178.9716	1.2035	299.1	11
11	7	15	6	188.6785	0.7273	298.8	11
11	7	15	7	192.7299	1.0282	298.7	11

9.4. Ty Ty, GA

Year	Month	Day	Hour	Wind direction (degrees)	Wind velocity (m/s)	Temperature (K)	Stability Class (A=1, B=2, ... F=6)
11	8	16	6	48.1485	0.3497	292.4	6
11	8	16	7	100.9996	0.3359	292.8	4
11	8	16	8	66.3893	0.3930	293.7	4
11	8	16	9	123.3018	0.6019	295.3	3
11	8	16	10	161.2801	0.9625	298.3	2
11	8	16	11	171.8261	0.8116	301.3	2
11	8	16	12	259.6228	0.7216	303.0	2
11	8	16	13	243.2010	1.2623	305.1	1
11	8	16	14	11.3246	1.6778	305.8	1
11	8	16	15	299.3539	1.6457	306.4	1
11	8	16	16	303.4865	1.8107	306.9	1
11	8	16	17	347.0250	1.2919	307.2	1
11	8	16	18	340.2729	1.3464	307.2	2
11	8	16	19	328.8437	0.8895	305.3	3
11	8	16	20	329.0405	0.4175	304.0	4
11	8	16	21	46.3922	0.2854	300.1	4
11	8	16	22	81.5107	0.3099	297.4	6
11	8	16	23	127.1607	0.3553	296.0	6
11	8	16	24	81.0672	0.3575	295.1	6
11	8	17	1	281.3732	0.3893	295.8	6
11	8	17	2	24.4623	0.2984	295.5	6
11	8	17	3	49.8728	0.4599	294.7	6
11	8	17	4	67.7044	0.4212	293.5	6
11	8	17	5	151.1236	0.3870	293.3	6
11	8	17	6	121.9180	0.3749	292.4	6
11	8	17	7	127.9318	0.2810	291.9	4
11	8	17	8	160.6596	0.3460	292.5	4
11	8	17	9	227.0945	0.8439	296.6	2

Year	Month	Day	Hour	Wind direction (degrees)	Wind velocity (m/s)	Temperature (K)	Stability Class (A=1, B=2, ... F=6)
11	8	17	10	219.8492	0.9505	300.0	2
11	8	17	11	247.9630	0.8000	303.6	1
11	8	17	12	226.3492	1.2045	305.5	1
11	8	17	13	284.0736	1.6020	306.3	1
11	8	17	14	270.3995	1.4525	307.1	1
11	8	17	15	263.9056	1.5076	308.0	1
11	8	17	16	274.3889	1.7223	308.3	1
11	8	17	17	304.7393	1.7612	308.0	1
11	8	17	18	235.8072	1.4867	308.1	2
11	8	17	19	251.6545	1.2298	307.5	2
11	8	17	20	258.0371	0.5625	306.3	4
11	8	17	21	305.2442	0.7493	302.9	4
11	8	17	22	297.0855	1.0327	301.9	6
11	8	17	23	290.6487	0.4832	300.7	6
11	8	17	24	320.3383	0.8581	299.7	6
11	8	18	1	327.3137	0.9205	299.0	6
11	8	18	2	322.5979	0.6353	298.0	6
11	8	18	3	322.0055	0.4146	297.1	6
11	8	18	4	88.3908	0.3303	295.4	6
11	8	18	5	241.1119	0.4063	295.2	6
11	8	18	6	231.0582	0.3254	294.8	6
11	8	18	7	189.7539	0.4996	294.7	4
11	8	18	8	235.9068	0.6384	295.2	4
11	8	18	9	239.3175	1.1974	297.6	2
11	8	18	10	245.1823	1.1303	300.7	2
11	8	18	11	274.0134	1.4754	302.4	2
11	8	18	12	291.4539	1.3734	304.3	1
11	8	18	13	270.8919	1.4406	305.6	1
11	8	18	14	228.8841	1.9115	306.3	1
11	8	18	15	226.5789	1.7916	307.2	1
11	8	18	16	236.7110	1.5487	308.2	1

Year	Month	Day	Hour	Wind direction (degrees)	Wind velocity (m/s)	Temperature (K)	Stability Class (A=1, B=2, ... F=6)
11	8	18	17	238.7331	1.6384	308.1	1
11	8	18	18	234.3146	1.6569	308.2	2
11	8	18	19	283.0927	0.9843	307.7	3
11	8	18	20	331.0777	0.9836	305.4	4
11	8	18	21	329.2831	1.1479	302.9	4
11	8	18	22	346.1617	1.4465	301.0	6
11	8	18	23	342.5944	1.1187	299.8	6
11	8	18	24	340.6079	0.8141	298.9	6
11	8	19	1	335.5251	0.8934	298.3	6
11	8	19	2	326.9172	0.8542	297.6	6
11	8	19	3	3.7376	0.4573	296.7	6
11	8	19	4	6.3937	0.4319	295.7	6
11	8	19	5	131.6843	0.3543	294.9	6
11	8	19	6	64.5386	0.4220	294.2	6
11	8	19	7	126.7919	0.3336	293.8	4
11	8	19	8	77.5339	0.3216	293.7	4

10. APPENDIX C – 2010 ANALYTICAL RESULTS

10.1. Analytical data sets

Analytical Set #01

LOD (ng/tube):	**1.5**
LOQ (ng/tube):	**5**

Calibration Results	
weighting	1/x
fit	linear
slope	0.18
y-intercept	-0.000423
R	0.9998

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
101712-029-0001A1			Control	2,4-D 220	QC	162977	0	No Peak	0	ND	
101712-029-0001A2 + 1.5 ng/tube			LOD	2,4-D 220	QC	171739	2222	0.0743	1.4860		
101712-029-0001A3 + 5.0 ng/tube				2,4-D 220	QC	168628	7926	0.264	5.280		105.6
101712-029-0001A4 + 5.0 ng/tube				2,4-D 220	QC	165161	7730	0.263	5.260		105.2
101712-029-0001A5 + 50 ng/tube				2,4-D 220	QC	165011	75551	2.55	51.00		102.0
101712-029-0001A6 + 50 ng/tube				2,4-D 220	QC	167656	76228	2.53	50.60		101.2
0.075 ng/mL Standard (11)				2,4-D 220	Standard	187862	2795	0.0851			
0.125 ng/mL Standard (9)				2,4-D 220	Standard	190919	3931	0.117			
0.25 ng/mL				2,4-D	Standard	184408	8530	0.259			

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
Standard (8)				220							
0.625 ng/mL Standard (12)				2,4-D 220	Standard	188855	21021	0.621			
1.25 ng/mL Standard (13)				2,4-D 220	Standard	187136	39686	1.18			
2.5 ng/mL Standard (6)				2,4-D 220	Standard	190411	81209	2.37			
6.25 ng/mL Standard (14)				2,4-D 220	Standard	184732	207759	6.25			
12.5 ng/mL Standard (15)				2,4-D 220	Standard	186245	417009	12.4			
25.0 ng/mL Standard (16)				2,4-D 220	Standard	181163	822486	25.2			
101712-002-0033A1	002-0033	A1		2,4-D 220	Analytical Aliquot	173106	15146	0.489	9.780	9.7800	
101712-002-0033A2	002-0033	A2		2,4-D 220	Analytical Aliquot	169591	0	No Peak	0	ND	
101712-002-0034A1	002-0034	A1		2,4-D 220	Analytical Aliquot	177016	4774	0.152	3.040	(3.0400)	
101712-002-0034A2	002-0034	A2		2,4-D 220	Analytical Aliquot	160796	0	No Peak	0	ND	
101712-002-0035A1	002-0035	A1		2,4-D 220	Analytical Aliquot	178642	0	No Peak	0	ND	
101712-002-0035A2	002-0035	A2		2,4-D 220	Analytical Aliquot	164508	0	No Peak	0	ND	
101712-002-0036A1	002-0036	A1		2,4-D 220	Analytical Aliquot	174326	0	No Peak	0	ND	
101712-002-0036A2	002-0036	A2		2,4-D 220	Analytical Aliquot	158481	0	No Peak	0	ND	
Solvent Blank (10)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	
0.000 ng/mL Standard (10)				2,4-D 220	Analytical Aliquot	183198	0	No Peak	0	ND	
Solvent Blank (12)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	
Reagent Blank (19)				2,4-D 220	Analytical Aliquot	187262	0	No Peak	0	ND	
Solvent Blank (11)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	
Solvent Blank (13)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
Solvent Blank (2)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	
Solvent Blank (4)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	
101712-002-0037A1	002-0037	A1		2,4-D 220	Analytical Aliquot	182314	416	0.015	0.300	ND	
101712-002-0037A2	002-0037	A2		2,4-D 220	Analytical Aliquot	163617	0	No Peak	0	ND	
101712-002-0038A1	002-0038	A1		2,4-D 220	Analytical Aliquot	172371	0	No Peak	0	ND	
101712-002-0038A2	002-0038	A2		2,4-D 220	Analytical Aliquot	162335	0	No Peak	0	ND	
101712-002-0045A1	002-0045	A1		2,4-D 220	Analytical Aliquot	169845	84070	2.75	55.00	55.0000	
101712-002-0045A2	002-0045	A2		2,4-D 220	Analytical Aliquot	167406	0	No Peak	0	ND	
101712-002-0046A1	002-0046	A1		2,4-D 220	Analytical Aliquot	172801	47346	1.53	30.60	30.6000	
101712-002-0046A2	002-0046	A2		2,4-D 220	Analytical Aliquot	165207	0	No Peak	0	ND	

*A1 = tube front; A2 = tube back

Calibration Results	
weighting	1/x
fit	linear
slope	0.18
y-intercept	1.27E-4
R	1

Analytical Set #02

LOD (ng/tube):	**1.5**
LOQ (ng/tube):	**5**

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
101712-029-0001A14			Control	2,4-D 220	QC	328315	0	No Peak	0	ND	
101712-029-0001A9 + 1.5 ng/tube			LOD	2,4-D 220	QC	315692	4216	0.0735	1.4700		
101712-029-0001A10 + 5.0 ng/tube				2,4-D 220	QC	315909	14209	0.249	4.980		99.6
101712-029-0001A11 + 5.0 ng/tube				2,4-D 220	QC	312640	14919	0.265	5.300		106.0
101712-029-0001A12 + 50 ng/tube				2,4-D 220	QC	322159	144959	2.5	50.0		100
101712-029-0001A13 + 50 ng/tube				2,4-D 220	QC	319600	145755	2.53	50.60		101.2
0.075 ng/mL Standard (18)				2,4-D 220	Standard	379961	4763	0.069			
0.125 ng/mL Standard (19)				2,4-D 220	Standard	373477	8623	0.128			
0.250 ng/mL Standard (20)				2,4-D 220	Standard	364559	17308	0.263			
0.625 ng/mL Standard (21)				2,4-D 220	Standard	365843	42502	0.645			

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
1.25 ng/mL Standard (22)				2,4-D 220	Standard	367848	82355	1.24			
2.50 ng/mL Standard (23)				2,4-D 220	Standard	366951	161887	2.45			
6.25 ng/mL Standard (24)				2,4-D 220	Standard	370644	413882	6.21			
12.5 ng/mL Standard (25)				2,4-D 220	Standard	362650	819862	12.6			
25.0 ng/mL Standard (26)				2,4-D 220	Standard	360000	1619181	25			
101712-003-0033A1	003-0033	A1		2,4-D 220	Analytical Aliquot	357885	13909	0.215	4.300	(4.3000)	
101712-003-0033A2	003-0033	A2		2,4-D 220	Analytical Aliquot	326790	0	No Peak	0	ND	
101712-003-0034A1	003-0034	A1		2,4-D 220	Analytical Aliquot	354539	7088	0.11	2.20	(2.2000)	
101712-003-0034A2	003-0034	A2		2,4-D 220	Analytical Aliquot	315752	0	No Peak	0	ND	
101712-003-0035A1	003-0035	A1		2,4-D 220	Analytical Aliquot	362719	1017	0.0149	0.2980	ND	

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
101712-003-0035A2	003-0035	A2		2,4-D 220	Analytical Aliquot	314677	0	No Peak	0	ND	
101712-003-0036A1	003-0036	A1		2,4-D 220	Analytical Aliquot	334992	953	0.0151	0.3020	ND	
101712-003-0036A2	003-0036	A2		2,4-D 220	Analytical Aliquot	319926	0	No Peak	0	ND	
101712-003-0037A1	003-0037	A1		2,4-D 220	Analytical Aliquot	334465	740	0.0116	0.2320	ND	
101712-003-0037A2	003-0037	A2		2,4-D 220	Analytical Aliquot	319785	0	No Peak	0	ND	
101712-003-0038A1	003-0038	A1		2,4-D 220	Analytical Aliquot	348077	1122	0.0172	0.3440	ND	
101712-003-0038A2	003-0038	A2		2,4-D 220	Analytical Aliquot	316251	0	No Peak	0	ND	
101712-003-0045A1	003-0045	A1		2,4-D 220	Analytical Aliquot	332343	37748	0.631	12.620	12.6200	
101712-003-0045A2	003-0045	A2		2,4-D 220	Analytical Aliquot	315320	0	No Peak	0	ND	
101712-003-0046A1	003-0046	A1		2,4-D 220	Analytical Aliquot	334766	34974	0.58	11.60	11.6000	

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
101712-003-0046A2	003-0046	A2		2,4-D 220	Analytical Aliquot	318845	0	No Peak	0	ND	
101712-011-0033A1	011-0033	A1		2,4-D 220	Analytical Aliquot	347621	197333	3.15	63.00	63.0000	
101712-011-0033A2	011-0033	A2		2,4-D 220	Analytical Aliquot	317580	2408	0.0414	0.8280	ND	
101712-011-0034A1	011-0034	A1		2,4-D 220	Analytical Aliquot	323085	27109	0.466	9.320	9.3200	
101712-011-0034A2	011-0034	A2		2,4-D 220	Analytical Aliquot	316190	0	No Peak	0	ND	
101712-011-0035A1	011-0035	A1		2,4-D 220	Analytical Aliquot	334047	0	No Peak	0	ND	
101712-011-0035A2	011-0035	A2		2,4-D 220	Analytical Aliquot	321553	0	No Peak	0	ND	
101712-011-0036A1	011-0036	A1		2,4-D 220	Analytical Aliquot	341013	2696	0.0432	0.8640	ND	
101712-011-0036A2	011-0036	A2		2,4-D 220	Analytical Aliquot	317443	0	No Peak	0	ND	
Solvent Blank (15)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
0.000 ng/mL Standard (17)				2,4-D 220	Analytical Aliquot	373972	0	No Peak			
Reagent Blank (21)				2,4-D 220	Analytical Aliquot	377253	808	0.0112	0.2240	ND	
Solvent Blank (16)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	
Solvent Blank (17)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	
Solvent Blank (18)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	
Solvent Blank (19)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	
Solvent Blank (20)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	
101712-011-0037A1	011-0037	A1		2,4-D 220	Analytical Aliquot	317782	2039	0.035	0.700	ND	
101712-011-0037A2	011-0037	A2		2,4-D 220	Analytical Aliquot	311753	0	No Peak	0	ND	
101712-011-0038A1	011-0038	A1		2,4-D 220	Analytical Aliquot	333679	1013	0.0162	0.3240	ND	

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
101712-011-0038A2	011-0038	A2		2,4-D 220	Analytical Aliquot	315287	0	No Peak	0	ND	
101712-011-0045A1	011-0045	A1		2,4-D 220	Analytical Aliquot	339117	529091	8.67	173.40	173.4000	
101712-011-0045A2	011-0045	A2		2,4-D 220	Analytical Aliquot	320215	7032	0.121	2.420	(2.4200)	
101712-011-0046A1	011-0046	A1		2,4-D 220	Analytical Aliquot	338370	282877	4.65	93.00	93.0000	
101712-011-0046A2	011-0046	A2		2,4-D 220	Analytical Aliquot	312454	1526	0.0264	0.5280	ND	
101712-012-0033A1	012-0033	A1		2,4-D 220	Analytical Aliquot	337461	378792	6.24	124.80	124.8000	
101712-012-0033A2	012-0033	A2		2,4-D 220	Analytical Aliquot	316431	2918	0.0506	1.0120	ND	
101712-012-0034A1	012-0034	A1		2,4-D 220	Analytical Aliquot	332613	103764	1.73	34.60	34.6000	
101712-012-0034A2	012-0034	A2		2,4-D 220	Analytical Aliquot	314910	369	0.00581	0.11620	ND	
101712-012-0035A1	012-0035	A1		2,4-D 220	Analytical Aliquot	323618	39980	0.686	13.720	13.7200	

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
101712-012-0035A2	012-0035	A2		2,4-D 220	Analytical Aliquot	315792	0	No Peak	0	ND	
101712-012-0036A1	012-0036	A1		2,4-D 220	Analytical Aliquot	320503	17583	0.304	6.080	6.0800	
101712-012-0036A2	012-0036	A2		2,4-D 220	Analytical Aliquot	313367	0	No Peak	0	ND	
101712-012-0037A1	012-0037	A1		2,4-D 220	Analytical Aliquot	340211	40807	0.666	13.320	13.3200	
101712-012-0037A2	012-0037	A2		2,4-D 220	Analytical Aliquot	313256	719	0.012	0.240	ND	
101712-012-0038A1	012-0038	A1		2,4-D 220	Analytical Aliquot	346481	8227	0.131	2.620	(2.6200)	
101712-012-0038A2	012-0038	A2		2,4-D 220	Analytical Aliquot	314298	0	No Peak	0	ND	
101712-012-0045A1	012-0045	A1		2,4-D 220	Analytical Aliquot	334906	483380	8.02	160.40	160.4000	
101712-012-0045A2	012-0045	A2		2,4-D 220	Analytical Aliquot	309387	2208	0.039	0.780	ND	
101712-012-0046A1	012-0046	A1		2,4-D 220	Analytical Aliquot	327674	249347	4.23	84.60	84.6000	

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
101712-012-0046A2	012-0046	A2		2,4-D 220	Analytical Aliquot	311521	4220	0.0746	1.4920	ND	

*A1 = tube front; A2 = tube back

Calibration Results	
weighting	1/x
fit	linear
slope	0.18
y-intercept	8.22E-08
R	1

Analytical Set #03

LOD (ng/tube):	**1.5**
LOQ (ng/tube):	**5**

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
101712-029-0001A15	029-0001		Control	2,4-D 220	Quality Control	330200	0	No Peak	0	ND	
101712-029-0001A25 + 1.5 ng/tube	029-0001		LOD	2,4-D 220	Quality Control	333353	4708	0.0767	1.5340		
101712-029-0001A35 + 5.0 ng/tube	029-0001			2,4-D 220	Quality Control	322079	14390	0.246	4.920		98.4

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
101712-029-0001A36 + 5.0 ng/tube	029-0001			2,4-D 220	Quality Control	332029	14257	0.237	4.740		94.8
101712-029-0001A49 + 50 ng/tube	029-0001			2,4-D 220	Quality Control	339901	151130	2.47	49.40		98.8
101712-029-0001A50 + 50 ng/tube	029-0001			2,4-D 220	Quality Control	351578	157655	2.49	49.80		99.6
101712-002-0001A1	002-0001	A1		2,4-D 220	Analytical Aliquot	348924	17232	0.272	5.440	5.4400	
101712-002-0002A1	002-0002	A1		2,4-D 220	Analytical Aliquot	351134	8324	0.13	2.60	(2.6000)	
101712-002-0003A1	002-0003	A1		2,4-D 220	Analytical Aliquot	353889	3498	0.0532	1.0640	ND	
101712-002-0004A1	002-0004	A1		2,4-D 220	Analytical Aliquot	361728	1955	0.0283	0.5660	ND	
101712-002-0007A1	002-0007	A1		2,4-D 220	Analytical Aliquot	352817	1218	0.0175	0.3500	ND	
101712-002-0008A1	002-0008	A1		2,4-D 220	Analytical Aliquot	340316	1468	0.0222	0.4440	ND	
101712-002-0015A1	002-0015	A1		2,4-D 220	Analytical Aliquot	341819	125122	2.03	40.60	40.6000	

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
101712-002-0016A1	002-0016	A1		2,4-D 220	Analytical Aliquot	344925	24496	0.393	7.860	7.8600	
101712-002-0017A1	002-0017	A1		2,4-D 220	Analytical Aliquot	352638	91668	1.44	28.80	28.8000	
101712-002-0018A1	002-0018	A1		2,4-D 220	Analytical Aliquot	361662	7759	0.117	2.340	(2.3400)	
101712-002-0019A1	002-0019	A1		2,4-D 220	Analytical Aliquot	344838	0	No Peak	0	ND	
101712-002-0020A1	002-0020	A1		2,4-D 220	Analytical Aliquot	348618	1486	0.022	0.440	ND	
101712-002-0023A1	002-0023	A1		2,4-D 220	Analytical Aliquot	346972	576	0.00751	0.15020	ND	
101712-002-0024A1	002-0024	A1		2,4-D 220	Analytical Aliquot	336445	664	0.00926	0.18520	ND	
101712-002-0031A1	002-0031	A1		2,4-D 220	Analytical Aliquot	331041	180324	3.02	60.40	60.4000	
101712-002-0032A1	002-0032	A1		2,4-D 220	Analytical Aliquot	341039	182064	2.96	59.20	59.2000	
101712-002-0001A2	002-0001	A2		2,4-D 220	Analytical Aliquot	334909	0	No Peak	0	ND	

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
101712-002-0002A2	002-0002	A2		2,4-D 220	Analytical Aliquot	325673	0	No Peak	0	ND	
101712-002-0003A2	002-0003	A2		2,4-D 220	Analytical Aliquot	314795	0	No Peak	0	ND	
101712-002-0004A2	002-0004	A2		2,4-D 220	Analytical Aliquot	324646	0	No Peak	0	ND	
101712-002-0007A2	002-0007	A2		2,4-D 220	Analytical Aliquot	316589	0	No Peak	0	ND	
101712-002-0008A2	002-0008	A2		2,4-D 220	Analytical Aliquot	316831	0	No Peak	0	ND	
101712-002-0015A2	002-0015	A2		2,4-D 220	Analytical Aliquot	328334	0	No Peak	0	ND	
101712-002-0016A2	002-0016	A2		2,4-D 220	Analytical Aliquot	322890	0	No Peak	0	ND	
101712-002-0017A2	002-0017	A2		2,4-D 220	Analytical Aliquot	312203	0	No Peak	0	ND	
101712-002-0018A2	002-0018	A2		2,4-D 220	Analytical Aliquot	321330	0	No Peak	0	ND	
101712-002-0019A2	002-0019	A2		2,4-D 220	Analytical Aliquot	328774	0	No Peak	0	ND	

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
101712-002-0020A2	002-0020	A2		2,4-D 220	Analytical Aliquot	325932	0	No Peak	0	ND	
101712-002-0023A2	002-0023	A2		2,4-D 220	Analytical Aliquot	329795	0	No Peak	0	ND	
101712-002-0024A2	002-0024	A2		2,4-D 220	Analytical Aliquot	316285	0	No Peak	0	ND	
101712-002-0031A2	002-0031	A2		2,4-D 220	Analytical Aliquot	322112	0	No Peak	0	ND	
101712-002-0032A2	002-0032	A2		2,4-D 220	Analytical Aliquot	320396	0	No Peak	0	ND	

*A1 = tube front; A2 = tube back

Analytical Set #04

LOD (ng/tube):	**1.5**
LOQ (ng/tube):	**5**

Calibration Results	
weighting	1/x
fit	linear
slope	0.18
y-intercept	-9.46E-04
R	1

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
101712-029-0001A16	029-0001	16	Control	2,4-D 220	Quality Control	272318	479	0.0149	0.2980	ND	
101712-029-0001A26 + 1.5 ng/tube	029-0001	be	LOD	2,4-D 220	Quality Control	268316	3979	0.0872	1.4460		
101712-029-0001A37 + 5.0 ng/tube	029-0001	be		2,4-D 220	Quality Control	260529	13514	0.292	5.542		110.84
101712-029-0001A38 + 5.0 ng/tube	029-0001	be		2,4-D 220	Quality Control	272230	13003	0.269	5.082		101.64
101712-029-0001A51 + 50 ng/tube	029-0001	be		2,4-D 220	Quality Control	270880	127032	2.6	51.702		103.404
101712-029-0001A52 + 50 ng/tube	029-0001	be		2,4-D 220	Quality Control	267384	122306	2.53	50.302		100.604
0.075 ng/mL Standard (33)				2,4-D 220	Standard	347985	4755	0.0808			
0.125 ng/mL Standard (38)				2,4-D 220	Standard	336964	7167	0.123			
0.25 ng/mL Standard (43)				2,4-D 220	Standard	341225	15382	0.254			
0.625 ng/mL Standard (48)				2,4-D 220	Standard	343295	37849	0.615			

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
1.25 ng/mL Standard (53)				2,4-D 220	Standard	339006	73717	1.21			
2.50 ng/mL Standard (58)				2,4-D 220	Standard	341362	147920	2.4			
6.25 ng/mL Standard (63)				2,4-D 220	Standard	339321	387114	6.31			
12.5 ng/mL Standard (68)				2,4-D 220	Standard	342637	772178	12.5			
25.0 ng/mL Standard (73)				2,4-D 220	Standard	336285	1527068	25.1			
101712-002-0039A1	002-0039	A1		2,4-D 220	Analytical Aliquot	268138	591	0.0174	0.3480	ND	
101712-002-0040A1	002-0040	A1		2,4-D 220	Analytical Aliquot	269987	0	No Peak	0	ND	
101712-002-0041A1	002-0041	A1		2,4-D 220	Analytical Aliquot	267676	3311	0.0736	1.4720	ND	
101712-002-0042A1	002-0042	A1		2,4-D 220	Analytical Aliquot	287218	437	0.0136	0.2720	ND	
101712-002-0047A1	002-0047	A1		2,4-D 220	Analytical Aliquot	281648	65668	1.29	25.80	25.8000	

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
101712-002-0048A1	002-0048	A1		2,4-D 220	Analytical Aliquot	256839	27502	0.597	11.940	11.9400	
101712-003-0001A1	003-0001	A1		2,4-D 220	Analytical Aliquot	263282	3874	0.0866	1.7320	(1.7320)	
101712-003-0002A1	003-0002	A1		2,4-D 220	Analytical Aliquot	273470	2842	0.0627	1.2540	ND	
101712-003-0003A1	003-0003	A1		2,4-D 220	Analytical Aliquot	263733	1415	0.0349	0.6980	ND	
101712-003-0004A1	003-0004	A1		2,4-D 220	Analytical Aliquot	270136	1966	0.0455	0.9100	ND	
101712-003-0007A1	003-0007	A1		2,4-D 220	Analytical Aliquot	274449	3358	0.0729	1.4580	ND	
101712-003-0008A1	003-0008	A1		2,4-D 220	Analytical Aliquot	267755	951	0.0249	0.4980	ND	
101712-003-0015A1	003-0015	A1		2,4-D 220	Analytical Aliquot	271149	8181	0.172	3.440	(3.4400)	
101712-003-0016A1	003-0016	A1		2,4-D 220	Analytical Aliquot	290174	1307	0.0301	0.6020	ND	
101712-003-0017A1	003-0017	A1		2,4-D 220	Analytical Aliquot	279392	17908	0.36	7.20	7.2000	

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
101712-003-0018A1	003-0018	A1		2,4-D 220	Analytical Aliquot	71234	1969	0.158	3.160	(3.1600)	
101712-003-0019A1	003-0019	A1		2,4-D 220	Analytical Aliquot	276395	1513	0.0355	0.7100	ND	
101712-003-0020A1	003-0020	A1		2,4-D 220	Analytical Aliquot	273579	2350	0.0527	1.0540	ND	
101712-003-0023A1	003-0023	A1		2,4-D 220	Analytical Aliquot	267314	1109	0.0282	0.5640	ND	
101712-003-0024A1	003-0024	A1		2,4-D 220	Analytical Aliquot	265706	1558	0.0377	0.7540	ND	
101712-003-0031A1	003-0031	A1		2,4-D 220	Analytical Aliquot	265354	26883	0.565	11.300	11.3000	
101712-003-0032A1	003-0032	A1		2,4-D 220	Analytical Aliquot	267309	18893	0.396	7.920	7.9200	
101712-003-0039A1	003-0039	A1		2,4-D 220	Analytical Aliquot	270669	577	0.017	0.340	ND	
101712-003-0040A1	003-0040	A1		2,4-D 220	Analytical Aliquot	274165	814	0.0217	0.4340	ND	
101712-003-0041A1	003-0041	A1		2,4-D 220	Analytical Aliquot	266822	2035	0.0474	0.9480	ND	

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
101712-003-0042A1	003-0042	A1		2,4-D 220	Analytical Aliquot	263960	545	0.0167	0.3340	ND	
101712-003-0047A1	003-0047	A1		2,4-D 220	Analytical Aliquot	265918	17143	0.362	7.240	7.2400	
101712-003-0048A1	003-0048	A1		2,4-D 220	Analytical Aliquot	267779	8837	0.188	3.760	(3.7600)	
101712-011-0039A1	011-0039	A1		2,4-D 220	Analytical Aliquot	259382	655	0.0192	0.3840	ND	
101712-011-0040A1	011-0040	A1		2,4-D 220	Analytical Aliquot	266900	5746	0.124	2.480	(2.4800)	
101712-011-0041A1	011-0041	A1		2,4-D 220	Analytical Aliquot	269556	36711	0.758	15.160	15.1600	
101712-011-0042A1	011-0042	A1		2,4-D 220	Analytical Aliquot	271057	3324	0.073	1.460	ND	
101712-011-0047A1	011-0047	A1		2,4-D 220	Analytical Aliquot	269609	194386	3.99	79.80	79.8000	
101712-011-0048A1	011-0048	A1		2,4-D 220	Analytical Aliquot	272956	74940	1.52	30.40	30.4000	
101712-012-0039A1	012-0039	A1		2,4-D 220	Analytical Aliquot	276506	9143	0.188	3.760	(3.7600)	

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
101712-012-0040A1	012-0040	A1		2,4-D 220	Analytical Aliquot	272415	1438	0.0344	0.6880	ND	
101712-012-0041A1	012-0041	A1		2,4-D 220	Analytical Aliquot	276099	45459	0.916	18.320	18.3200	
101712-012-0042A1	012-0042	A1		2,4-D 220	Analytical Aliquot	269641	6116	0.131	2.620	(2.6200)	
101712-012-0047A1	012-0047	A1		2,4-D 220	Analytical Aliquot	264028	214899	4.51	90.20	90.2000	
101712-012-0048A1	012-0048	A1		2,4-D 220	Analytical Aliquot	272741	86919	1.77	35.40	35.4000	
Solvent Blank (8)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	
0.000 ng/mL Standard (28)				2,4-D 220	Analytical Aliquot	336345	0	No Peak			
Reagent Blank (23)				2,4-D 220	Analytical Aliquot	347177	0	No Peak	0	ND	
Solvent Blank (9)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	
Solvent Blank (26)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	

aliquot	sample number	Subsample*	LOD status	analyte	Sample Type	IS Peak Area (counts)	analyte peak area (counts)	analyte concentration (ng/mL)	corrected amount (ng/tube)	reported amount (ng/tube)	recovery (%)
Solvent Blank (27)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	
Solvent Blank (28)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	
Solvent Blank (29)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	
Solvent Blank (30)				2,4-D 220	Analytical Aliquot	0	0	N/A	0	ND	

10.2. Air concentration summary – Farmland, IN site

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
011-0001	1	1	A0	3.00	223.36	120.0000	537.2553	5.3726E-01
011-0002	1	1	B0	3.05	232.67	65.8000	282.7991	2.8280E-01
011-0003	1	1	A45	3.15	241.84	0.1420	0.5872	5.8717E-04
011-0004	1	1	B45	3.12	241.28	0.1298	0.5380	5.3796E-04
011-0005	1	1	A90	3.23	232.38	0.0000	0.0000	0.0000E+00
011-0006	1	1	B90	3.32	249.49	0.0000	0.0000	0.0000E+00
011-0007	1	1	A135	3.38	254.57	0.0000	0.0000	0.0000E+00
011-0008	1	1	B135	3.42	242.62	0.1206	0.4971	4.9706E-04
011-0009	1	1	A180	3.50	256.40	0.0652	0.2543	2.5429E-04
011-0010	1	1	B180	3.55	258.39	0.1920	0.7431	7.4307E-04

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
011-0011	1	1	A225	3.60	266.74	0.0292	0.1095	1.0947E-04
011-0012	1	1	B225	3.65	272.84	0.2800	1.0262	1.0262E-03
011-0013	1	1	A270	3.72	275.91	103.8000	376.2151	3.7622E-01
011-0014	1	1	B270	3.75	279.99	33.6000	120.0043	1.2000E-01
011-0015	1	1	A315	2.92	222.42	125.2000	562.8990	5.6290E-01
011-0016	1	1	B315	2.95	241.43	82.8000	342.9637	3.4296E-01
011-0017	1	2	A0	2.42	192.00	26.6000	138.5417	1.3854E-01
011-0018	1	2	B0	2.43	193.00	0.5880	3.0466	3.0466E-03
011-0019	1	2	A45	2.50	192.08	0.3120	1.6244	1.6244E-03
011-0020	1	2	B45	2.53	199.00	0.0000	0.0000	0.0000E+00
011-0021	1	2	A90	2.62	204.00	0.0000	0.0000	0.0000E+00
011-0022	1	2	B90	2.65	211.15	0.0000	0.0000	0.0000E+00
011-0023	1	2	A135	2.72	210.00	0.0000	0.0000	0.0000E+00
011-0024	1	2	B135	2.75	222.60	0.0000	0.0000	0.0000E+00
011-0025	1	2	A180	2.82	216.00	2.4600	11.3889	1.1389E-02
011-0026	1	2	B180	2.85	218.00	0.0000	0.0000	0.0000E+00
011-0027	1	2	A225	2.90	221.00	1.5400	6.9683	6.9683E-03
011-0028	1	2	B225	2.93	223.00	0.6860	3.0762	3.0762E-03
011-0029	1	2	A270	3.00	227.00	208.0000	916.2996	9.1630E-01
011-0030	1	2	B270	3.03	229.00	114.2000	498.6900	4.9869E-01
011-0031	1	2	A315	3.08	232.00	0.0000	0.0000	0.0000E+00
011-0032	1	2	B315	3.13	235.00	0.0000	0.0000	0.0000E+00
011-0033	1	3	A0	2.87	230.18	63.0000	273.7012	2.7370E-01
011-0034	1	3	B0	2.90	237.13	9.3200	39.3034	3.9303E-02
011-0035	1	3	A45	1.97	195.66	0.0000	0.0000	0.0000E+00

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
011-0036	1	3	B45	1.92	169.24	0.8640	5.1053	5.1053E-03
011-0037	1	3	A90	2.05	190.46	0.7000	3.6753	3.6753E-03
011-0038	1	3	B90	2.12	197.74	0.3240	1.6385	1.6385E-03
011-0039	1	3	A135	2.20	186.35	0.3840	2.0607	2.0607E-03
011-0040	1	3	B135	2.27	194.06	2.4800	12.7798	1.2780E-02
011-0041	1	3	A180	2.33	198.90	15.1600	76.2192	7.6219E-02
011-0042	1	3	B180	2.40	212.33	1.4600	6.8760	6.8760E-03
011-0043	1	3	A225	2.47	214.27	91.6000	427.5050	4.2750E-01
011-0044	1	3	B225	2.55	221.00	24.0000	108.5973	1.0860E-01
011-0045	1	3	A270	2.62	223.87	175.8200	785.3595	7.8536E-01
011-0046	1	3	B270	2.67	228.01	93.0000	407.8813	4.0788E-01
011-0047	1	3	A315	2.75	221.21	79.8000	360.7432	3.6074E-01
011-0048	1	3	B315	2.80	225.56	30.4000	134.7730	1.3477E-01
012-0001	2	1	A0	8.98	366.72	0.0000	0.0000	0.0000E+00
012-0002	2	1	B0	9.02	383.42	0.0000	0.0000	0.0000E+00
012-0003	2	1	A45	9.15	392.22	0.0000	0.0000	0.0000E+00
012-0004	2	1	B45	9.07	389.13	0.0000	0.0000	0.0000E+00
012-0005	2	1	A90	9.20	371.96	0.0000	0.0000	0.0000E+00
012-0006	2	1	B90	9.27	382.35	0.0000	0.0000	0.0000E+00
012-0007	2	1	A135	9.33	356.38	0.0000	0.0000	0.0000E+00
012-0008	2	1	B135	9.40	352.36	0.0000	0.0000	0.0000E+00
012-0009	2	1	A180	9.47	353.54	0.0036	0.0102	1.0239E-05
012-0010	2	1	B180	9.50	360.37	0.0150	0.0416	4.1568E-05
012-0011	2	1	A225	9.57	360.24	0.2420	0.6718	6.7178E-04
012-0012	2	1	B225	9.60	359.07	0.0000	0.0000	0.0000E+00

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
012-0013	2	1	A270	9.68	378.41	2.0000	5.2853	5.2853E-03
012-0014	2	1	B270	9.72	360.51	1.5400	4.2718	4.2718E-03
012-0015	2	1	A315	8.83	362.63	1.9460	5.3663	5.3663E-03
012-0016	2	1	B315	8.88	363.83	1.5360	4.2217	4.2217E-03
012-0017	2	2	A0	8.42	378.00	11.9000	31.4815	3.1481E-02
012-0018	2	2	B0	8.45	370.03	6.4800	17.5123	1.7512E-02
012-0019	2	2	A45	8.52	361.00	2.8400	7.8670	7.8670E-03
012-0020	2	2	B45	8.55	351.97	0.0000	0.0000	0.0000E+00
012-0021	2	2	A90	8.65	380.10	0.8780	2.3099	2.3099E-03
012-0022	2	2	B90	8.70	372.07	0.0000	0.0000	0.0000E+00
012-0023	2	2	A135	8.78	364.00	0.0000	0.0000	0.0000E+00
012-0024	2	2	B135	8.82	373.10	0.0000	0.0000	0.0000E+00
012-0025	2	2	A180	8.87	372.07	0.4700	1.2632	1.2632E-03
012-0026	2	2	B180	8.90	353.93	0.0067	0.0190	1.9044E-05
012-0027	2	2	A225	8.93	352.95	0.3240	0.9180	9.1798E-04
012-0028	2	2	B225	8.97	362.00	0.0000	0.0000	0.0000E+00
012-0029	2	2	A270	9.03	362.00	9.7800	27.0166	2.7017E-02
012-0030	2	2	B270	9.08	363.00	4.6600	12.8375	1.2837E-02
012-0031	2	2	A315	9.13	353.92	11.8000	33.3404	3.3340E-02
012-0032	2	2	B315	9.17	362.00	5.2400	14.4751	1.4475E-02
012-0033	2	3	A0	8.88	354.14	124.8000	352.4020	3.5240E-01
012-0034	2	3	B0	8.93	359.29	34.6000	96.3024	9.6302E-02
012-0035	2	3	A45	7.92	338.97	13.7200	40.4754	4.0475E-02
012-0036	2	3	B45	7.83	365.83	6.0800	16.6199	1.6620E-02
012-0037	2	3	A90	8.18	378.49	13.3200	35.1927	3.5193E-02

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
012-0038	2	3	B90	8.27	368.63	2.6200	7.1074	7.1074E-03
012-0039	2	3	A135	8.33	396.70	3.7600	9.4781	9.4781E-03
012-0040	2	3	B135	8.40	379.59	0.6880	1.8125	1.8125E-03
012-0041	2	3	A180	8.45	381.50	18.3200	48.0214	4.8021E-02
012-0042	2	3	B180	8.50	367.10	2.6200	7.1371	7.1371E-03
012-0043	2	3	A225	8.57	373.14	44.0000	117.9192	1.1792E-01
012-0044	2	3	B225	8.62	370.01	12.7200	34.3778	3.4378E-02
012-0045	2	3	A270	8.67	367.17	160.4000	436.8495	4.3685E-01
012-0046	2	3	B270	8.72	368.45	84.6000	229.6136	2.2961E-01
012-0047	2	3	A315	8.78	376.84	90.2000	239.3576	2.3936E-01
012-0048	2	3	B315	8.83	370.69	35.4000	95.4981	9.5498E-02
013-0001	3	1	A0	14.92	366.68	0.4200	1.1454	1.1454E-03
013-0002	3	1	B0	14.93	366.18	0.2840	0.7756	7.7557E-04
013-0003	3	1	A45	15.08	368.89	0.2240	0.6072	6.0723E-04
013-0004	3	1	B45	15.03	NA	0.2280	NA	NA
013-0005	3	1	A90	15.18	373.90	0.2380	0.6365	6.3654E-04
013-0006	3	1	B90	15.23	366.41	0.0350	0.0955	9.5521E-05
013-0007	3	1	A135	15.32	364.74	0.1092	0.2994	2.9939E-04
013-0008	3	1	B135	15.35	379.13	0.0000	0.0000	0.0000E+00
013-0009	3	1	A180	15.43	373.75	0.0202	0.0540	5.4047E-05
013-0010	3	1	B180	15.47	366.59	0.0000	0.0000	0.0000E+00
013-0011	3	1	A225	15.55	374.80	0.0000	0.0000	0.0000E+00
013-0012	3	1	B225	15.60	367.92	0.0000	0.0000	0.0000E+00
013-0013	3	1	A270	15.75	401.67	0.2520	0.6274	6.2737E-04
013-0014	3	1	B270	15.72	348.84	0.0000	0.0000	0.0000E+00

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
013-0015	3	1	A315	14.87	368.70	0.1840	0.4991	4.9905E-04
013-0016	3	1	B315	14.83	358.18	0.0000	0.0000	0.0000E+00
013-0017	3	2	A0	14.40	367.98	1.0440	2.8371	2.8371E-03
013-0018	3	2	B0	14.43	367.97	0.2420	0.6577	6.5765E-04
013-0019	3	2	A45	14.50	350.03	0.0000	0.0000	0.0000E+00
013-0020	3	2	B45	14.53	359.00	0.0000	0.0000	0.0000E+00
013-0021	3	2	A90	14.58	356.00	0.1680	0.4719	4.7191E-04
013-0022	3	2	B90	14.63	347.10	0.0000	0.0000	0.0000E+00
013-0023	3	2	A135	14.70	355.00	0.0000	0.0000	0.0000E+00
013-0024	3	2	B135	14.73	319.50	1.1840	3.7058	3.7058E-03
013-0025	3	2	A180	14.80	364.90	2.8600	7.8378	7.8378E-03
013-0026	3	2	B180	14.83	356.00	2.4800	6.9663	6.9663E-03
013-0027	3	2	A225	14.90	366.95	3.4200	9.3201	9.3201E-03
013-0028	3	2	B225	14.93	358.00	2.8800	8.0447	8.0447E-03
013-0029	3	2	A270	14.98	348.08	7.5600	21.7195	2.1719E-02
013-0030	3	2	B270	15.02	356.00	3.9400	11.0674	1.1067E-02
013-0031	3	2	A315	15.08	348.07	0.4700	1.3503	1.3503E-03
013-0032	3	2	B315	15.12	357.00	0.5480	1.5350	1.5350E-03
013-0033	3	3	A0	14.80	367.07	61.4000	167.2705	1.6727E-01
013-0034	3	3	B0	14.85	381.09	19.1000	50.1191	5.0119E-02
013-0035	3	3	A45	13.88	392.55	6.8200	17.3737	1.7374E-02
013-0036	3	3	B45	13.83	371.88	4.0400	10.8637	1.0864E-02
013-0037	3	3	A90	13.95	346.17	3.3000	9.5328	9.5328E-03
013-0038	3	3	B90	14.05	350.47	0.2520	0.7190	7.1903E-04
013-0039	3	3	A135	14.10	370.57	0.1558	0.4204	4.2044E-04

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
013-0040	3	3	B135	14.17	362.61	0.0000	0.0000	0.0000E+00
013-0041	3	3	A180	14.27	363.83	8.2600	22.7028	2.2703E-02
013-0042	3	3	B180	14.32	350.22	1.4000	3.9975	3.9975E-03
013-0043	3	3	A225	14.40	376.43	29.8000	79.1658	7.9166E-02
013-0044	3	3	B225	14.45	352.63	10.6600	30.2304	3.0230E-02
013-0045	3	3	A270	14.53	368.90	99.6000	269.9948	2.6999E-01
013-0046	3	3	B270	14.60	371.53	46.8000	125.9648	1.2596E-01
013-0047	3	3	A315	14.67	369.77	64.0000	173.0817	1.7308E-01
013-0048	3	3	B315	14.72	353.53	16.5400	46.7853	4.6785E-02
014-0001	4	1	A0	20.80	355.47	0.0378	0.1063	1.0634E-04
014-0002	4	1	B0	20.88	360.05	0.0000	0.0000	0.0000E+00
014-0003	4	1	A45	21.00	366.54	0.2300	0.6275	6.2749E-04
014-0004	4	1	B45	20.95	356.95	0.2380	0.6668	6.6676E-04
014-0005	4	1	A90	21.13	362.89	0.0992	0.2734	2.7336E-04
014-0006	4	1	B90	21.08	348.10	0.0000	0.0000	0.0000E+00
014-0007	4	1	A135	21.18	353.41	0.0000	0.0000	0.0000E+00
014-0008	4	1	B135	21.23	352.47	0.0000	0.0000	0.0000E+00
014-0009	4	1	A180	21.32	366.06	0.0000	0.0000	0.0000E+00
014-0010	4	1	B180	21.35	359.71	0.0000	0.0000	0.0000E+00
014-0011	4	1	A225	21.42	369.07	0.0000	0.0000	0.0000E+00
014-0012	4	1	B225	21.45	357.14	0.0000	0.0000	0.0000E+00
014-0013	4	1	A270	21.52	351.05	0.1848	0.5264	5.2642E-04
014-0014	4	1	B270	21.57	354.51	0.0000	0.0000	0.0000E+00
014-0015	4	1	A315	20.77	364.97	0.0000	0.0000	0.0000E+00
014-0016	4	1	B315	20.77	364.37	0.0000	0.0000	0.0000E+00

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
014-0017	4	2	A0	20.42	361.00	0.6480	1.7950	1.7950E-03
014-0018	4	2	B0	20.45	361.00	0.2100	0.5817	5.8172E-04
014-0019	4	2	A45	20.50	351.00	1.9440	5.5385	5.5385E-03
014-0020	4	2	B45	20.53	360.00	0.3880	1.0778	1.0778E-03
014-0021	4	2	A90	20.58	360.00	0.0000	0.0000	0.0000E+00
014-0022	4	2	B90	20.62	350.03	0.0000	0.0000	0.0000E+00
014-0023	4	2	A135	20.68	359.00	0.4860	1.3538	1.3538E-03
014-0024	4	2	B135	20.72	350.03	0.0032	0.0092	9.1993E-06
014-0025	4	2	A180	20.77	366.95	1.5980	4.3548	4.3548E-03
014-0026	4	2	B180	20.80	358.00	0.5540	1.5475	1.5475E-03
014-0027	4	2	A225	20.87	375.90	1.7380	4.6236	4.6236E-03
014-0028	4	2	B225	20.90	358.00	0.6800	1.8994	1.8994E-03
014-0029	4	2	A270	20.95	358.00	1.8960	5.2961	5.2961E-03
014-0030	4	2	B270	20.98	358.00	0.7740	2.1620	2.1620E-03
014-0031	4	2	A315	21.05	358.00	0.5740	1.6034	1.6034E-03
014-0032	4	2	B315	21.08	358.00	1.2760	3.5642	3.5642E-03
014-0033	4	3	A0	20.67	370.48	10.6800	28.8275	2.8827E-02
014-0034	4	3	B0	20.63	363.14	2.1000	5.7830	5.7830E-03
014-0035	4	3	A45	19.90	374.36	1.4140	3.7771	3.7771E-03
014-0036	4	3	B45	19.83	362.88	0.5740	1.5818	1.5818E-03
014-0037	4	3	A90	19.93	380.00	0.8600	2.2631	2.2631E-03
014-0038	4	3	B90	20.00	356.29	0.3720	1.0441	1.0441E-03
014-0039	4	3	A135	20.07	381.09	0.1422	0.3731	3.7314E-04
014-0040	4	3	B135	20.13	369.81	0.0000	0.0000	0.0000E+00
014-0041	4	3	A180	20.20	368.28	11.9600	32.4751	3.2475E-02

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
014-0042	4	3	B180	20.23	383.58	0.5900	1.5382	1.5382E-03
014-0043	4	3	A225	20.30	383.20	56.4000	147.1797	1.4718E-01
014-0044	4	3	B225	20.35	363.91	26.4000	72.5450	7.2545E-02
014-0045	4	3	A270	20.42	370.83	70.4000	189.8462	1.8985E-01
014-0046	4	3	B270	20.45	364.69	31.0000	85.0039	8.5004E-02
014-0047	4	3	A315	20.52	362.06	14.1800	39.1652	3.9165E-02
014-0048	4	3	B315	20.57	366.79	4.9600	13.5225	1.3523E-02
015-0001	5	1	A0	33.83	772.62	9.4400	12.2182	1.2218E-02
015-0002	5	1	B0	33.80	803.67	5.4800	6.8187	6.8187E-03
015-0003	5	1	A45	33.93	817.13	0.0000	0.0000	0.0000E+00
015-0004	5	1	B45	33.90	819.35	0.0000	0.0000	0.0000E+00
015-0005	5	1	A90	34.05	795.54	0.0000	0.0000	0.0000E+00
015-0006	5	1	B90	34.00	785.27	0.0000	0.0000	0.0000E+00
015-0007	5	1	A135	34.12	800.06	0.0000	0.0000	0.0000E+00
015-0008	5	1	B135	34.15	743.77	0.0000	0.0000	0.0000E+00
015-0009	5	1	A180	34.22	801.48	0.0326	0.0407	4.0675E-05
015-0010	5	1	B180	34.25	789.09	0.0000	0.0000	0.0000E+00
015-0011	5	1	A225	34.32	788.51	0.1592	0.2019	2.0190E-04
015-0012	5	1	B225	34.37	788.56	0.0332	0.0421	4.2102E-05
015-0013	5	1	A270	34.45	789.19	9.3200	11.8095	1.1810E-02
015-0014	5	1	B270	34.48	793.21	4.5000	5.6731	5.6731E-03
015-0015	5	1	A315	33.77	800.67	14.2400	17.7851	1.7785E-02
015-0016	5	1	B315	33.75	790.69	4.2600	5.3877	5.3877E-03
015-0017	5	2	A0	33.42	780.00	3.5800	4.5897	4.5897E-03
015-0018	5	2	B0	33.45	780.00	1.1600	1.4872	1.4872E-03

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
015-0019	5	2	A45	33.50	780.00	0.0000	0.0000	0.0000E+00
015-0020	5	2	B45	33.53	799.50	0.0000	0.0000	0.0000E+00
015-0021	5	2	A90	33.60	800.52	0.0000	0.0000	0.0000E+00
015-0022	5	2	B90	33.63	800.53	0.0000	0.0000	0.0000E+00
015-0023	5	2	A135	33.70	781.00	0.0000	0.0000	0.0000E+00
015-0024	5	2	B135	33.73	839.58	0.0000	0.0000	0.0000E+00
015-0025	5	2	A180	33.78	800.52	0.4960	0.6196	6.1959E-04
015-0026	5	2	B180	33.82	781.00	0.0000	0.0000	0.0000E+00
015-0027	5	2	A225	33.87	819.00	0.7800	0.9524	9.5238E-04
015-0028	5	2	B225	33.90	780.00	0.0000	0.0000	0.0000E+00
015-0029	5	2	A270	33.97	800.53	21.2000	26.4826	2.6483E-02
015-0030	5	2	B270	34.00	781.00	10.7400	13.7516	1.3752E-02
015-0031	5	2	A315	34.05	780.00	16.9800	21.7692	2.1769E-02
015-0032	5	2	B315	34.08	780.00	7.7800	9.9744	9.9744E-03
015-0033	5	3	A0	33.58	827.70	70.4000	85.0550	8.5055E-02
015-0034	5	3	B0	33.63	838.89	13.5600	16.1642	1.6164E-02
015-0035	5	3	A45	32.87	823.90	3.5000	4.2481	4.2481E-03
015-0036	5	3	B45	32.83	842.79	1.7160	2.0361	2.0361E-03
015-0037	5	3	A90	32.90	854.63	4.8400	5.6632	5.6632E-03
015-0038	5	3	B90	32.97	864.75	2.2200	2.5672	2.5672E-03
015-0039	5	3	A135	33.05	830.41	0.2600	0.3131	3.1310E-04
015-0040	5	3	B135	33.10	807.56	0.2080	0.2576	2.5756E-04
015-0041	5	3	A180	33.15	810.41	7.3600	9.0818	9.0818E-03
015-0042	5	3	B180	33.20	862.41	1.3180	1.5283	1.5283E-03
015-0043	5	3	A225	33.27	857.74	65.0000	75.7801	7.5780E-02

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
015-0044	5	3	B225	33.32	813.01	19.7400	24.2801	2.4280E-02
015-0045	5	3	A270	33.38	825.85	284.0000	343.8894	3.4389E-01
015-0046	5	3	B270	33.42	821.96	168.8000	205.3635	2.0536E-01
015-0047	5	3	A315	33.48	820.40	208.0000	253.5346	2.5353E-01
015-0048	5	3	B315	33.52	824.01	68.6000	83.2516	8.3252E-02
016-0001	6	1	A0	44.90	668.22	1.4340	2.1460	2.1460E-03
016-0002	6	1	B0	44.92	692.01	1.8380	2.6560	2.6560E-03
016-0003	6	1	A45	44.98	702.78	1.3820	1.9665	1.9665E-03
016-0004	6	1	B45	45.02	702.68	1.4400	2.0493	2.0493E-03
016-0005	6	1	A90	45.07	678.52	0.8500	1.2527	1.2527E-03
016-0006	6	1	B90	45.10	666.67	0.5980	0.8970	8.9700E-04
016-0007	6	1	A135	45.17	686.21	0.3180	0.4634	4.6342E-04
016-0008	6	1	B135	45.20	697.14	0.4380	0.6283	6.2828E-04
016-0009	6	1	A180	45.28	691.22	1.2280	1.7766	1.7766E-03
016-0010	6	1	B180	45.32	678.94	0.6360	0.9368	9.3675E-04
016-0011	6	1	A225	45.37	671.62	1.7280	2.5729	2.5729E-03
016-0012	6	1	B225	45.40	674.58	0.9060	1.3431	1.3431E-03
016-0013	6	1	A270	45.48	694.77	3.4800	5.0089	5.0089E-03
016-0014	6	1	B270	45.53	755.49	2.6000	3.4415	3.4415E-03
016-0015	6	1	A315	44.87	683.98	1.6560	2.4211	2.4211E-03
016-0016	6	1	B315	44.83	681.29	1.5240	2.2369	2.2369E-03
016-0017	6	2	A0	44.42	660.00	0.7940	1.2030	1.2030E-03
016-0018	6	2	B0	44.45	660.00	0.6580	0.9970	9.9697E-04
016-0019	6	2	A45	44.50	643.50	0.7640	1.1873	1.1873E-03
016-0020	6	2	B45	44.53	660.00	0.8360	1.2667	1.2667E-03

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
016-0021	6	2	A90	44.60	676.50	1.1960	1.7679	1.7679E-03
016-0022	6	2	B90	44.63	693.00	1.1820	1.7056	1.7056E-03
016-0023	6	2	A135	44.70	660.00	0.6700	1.0152	1.0152E-03
016-0024	6	2	B135	44.73	676.50	0.9100	1.3452	1.3452E-03
016-0025	6	2	A180	44.78	693.00	4.0800	5.8874	5.8874E-03
016-0026	6	2	B180	44.82	660.00	2.0000	3.0303	3.0303E-03
016-0027	6	2	A225	44.87	693.00	3.8800	5.5988	5.5988E-03
016-0028	6	2	B225	44.90	660.00	2.2800	3.4545	3.4545E-03
016-0029	6	2	A270	44.97	676.50	4.1600	6.1493	6.1493E-03
016-0030	6	2	B270	45.00	660.00	2.3600	3.5758	3.5758E-03
016-0031	6	2	A315	45.05	660.00	0.8600	1.3030	1.3030E-03
016-0032	6	2	B315	45.08	660.00	0.4940	0.7485	7.4848E-04
016-0033	6	3	A0	44.63	688.19	9.2200	13.3974	1.3397E-02
016-0034	6	3	B0	44.68	717.70	2.5000	3.4834	3.4834E-03
016-0035	6	3	A45	43.92	697.81	4.8000	6.8787	6.8787E-03
016-0036	6	3	B45	43.85	668.60	2.6600	3.9785	3.9785E-03
016-0037	6	3	A90	43.97	701.52	1.3920	1.9843	1.9843E-03
016-0038	6	3	B90	44.03	657.03	0.9260	1.4094	1.4094E-03
016-0039	6	3	A135	44.10	709.08	0.7860	1.1085	1.1085E-03
016-0040	6	3	B135	44.15	692.17	0.6280	0.9073	9.0729E-04
016-0041	6	3	A180	44.22	691.89	7.9400	11.4758	1.1476E-02
016-0042	6	3	B180	44.25	706.09	2.6600	3.7672	3.7672E-03
016-0043	6	3	A225	44.32	692.83	54.4000	78.5180	7.8518E-02
016-0044	6	3	B225	44.37	697.14	16.3800	23.4958	2.3496E-02
016-0045	6	3	A270	44.42	704.70	115.0000	163.1902	1.6319E-01

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
016-0046	6	3	B270	44.47	700.46	57.2000	81.6607	8.1661E-02
016-0047	6	3	A315	44.53	693.83	15.0000	21.6191	2.1619E-02
016-0048	6	3	B315	44.57	712.06	3.3000	4.6344	4.6344E-03
017-0001	7	1	A0	57.92	785.30	9.2200	11.7408	1.1741E-02
017-0002	7	1	B0	57.93	813.80	3.7400	4.5957	4.5957E-03
017-0003	7	1	A45	57.98	826.02	0.3500	0.4237	4.2372E-04
017-0004	7	1	B45	58.02	821.34	0.5200	0.6331	6.3311E-04
017-0005	7	1	A90	58.10	809.76	0.2880	0.3557	3.5566E-04
017-0006	7	1	B90	58.13	815.63	0.2140	0.2624	2.6238E-04
017-0007	7	1	A135	58.22	813.54	0.0000	0.0000	0.0000E+00
017-0008	7	1	B135	58.25	781.47	0.1146	0.1466	1.4665E-04
017-0009	7	1	A180	58.32	825.79	0.9000	1.0899	1.0899E-03
017-0010	7	1	B180	58.35	812.50	0.1598	0.1967	1.9668E-04
017-0011	7	1	A225	58.42	802.97	0.7200	0.8967	8.9668E-04
017-0012	7	1	B225	58.45	810.80	0.7020	0.8658	8.6582E-04
017-0013	7	1	A270	58.52	843.00	11.8400	14.0451	1.4045E-02
017-0014	7	1	B270	58.57	781.53	5.5200	7.0631	7.0631E-03
017-0015	7	1	A315	57.87	814.71	19.6600	24.1313	2.4131E-02
017-0016	7	1	B315	57.83	815.88	4.2600	5.2214	5.2214E-03
017-0017	7	2	A0	57.42	780.00	6.8200	8.7436	8.7436E-03
017-0018	7	2	B0	57.45	780.00	1.8440	2.3641	2.3641E-03
017-0019	7	2	A45	57.50	838.50	0.8020	0.9565	9.5647E-04
017-0020	7	2	B45	57.53	799.50	0.8180	1.0231	1.0231E-03
017-0021	7	2	A90	57.60	799.50	0.3100	0.3877	3.8774E-04
017-0022	7	2	B90	57.63	819.00	0.4960	0.6056	6.0562E-04

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
017-0023	7	2	A135	57.70	799.50	0.3180	0.3977	3.9775E-04
017-0024	7	2	B135	57.73	819.00	0.7460	0.9109	9.1087E-04
017-0025	7	2	A180	57.78	819.00	0.8000	0.9768	9.7680E-04
017-0026	7	2	B180	57.82	799.50	0.6480	0.8105	8.1051E-04
017-0027	7	2	A225	57.88	820.05	2.6800	3.2681	3.2681E-03
017-0028	7	2	B225	57.92	781.00	0.5700	0.7298	7.2983E-04
017-0029	7	2	A270	57.97	799.50	5.7600	7.2045	7.2045E-03
017-0030	7	2	B270	58.00	780.00	3.8400	4.9231	4.9231E-03
017-0031	7	2	A315	58.05	819.00	11.4600	13.9927	1.3993E-02
017-0032	7	2	B315	58.08	780.00	4.5400	5.8205	5.8205E-03
017-0033	7	3	A0	57.67	817.58	53.8000	65.8039	6.5804E-02
017-0034	7	3	B0	57.72	843.00	14.0600	16.6786	1.6679E-02
017-0035	7	3	A45	56.95	815.63	7.0000	8.5824	8.5824E-03
017-0036	7	3	B45	56.85	823.29	4.7000	5.7088	5.7088E-03
017-0037	7	3	A90	57.02	816.28	4.5200	5.5373	5.5373E-03
017-0038	7	3	B90	57.07	829.31	1.4980	1.8063	1.8063E-03
017-0039	7	3	A135	57.12	839.57	1.5920	1.8962	1.8962E-03
017-0040	7	3	B135	57.17	810.29	0.7420	0.9157	9.1572E-04
017-0041	7	3	A180	57.22	810.03	8.1200	10.0243	1.0024E-02
017-0042	7	3	B180	57.28	822.66	1.5100	1.8355	1.8355E-03
017-0043	7	3	A225	57.35	827.36	40.2000	48.5885	4.8589E-02
017-0044	7	3	B225	57.40	817.58	12.0200	14.7019	1.4702E-02
017-0045	7	3	A270	57.47	831.55	134.6000	161.8672	1.6187E-01
017-0046	7	3	B270	57.50	825.01	67.0000	81.2111	8.1211E-02
017-0047	7	3	A315	57.57	824.62	78.2000	94.8317	9.4832E-02

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
017-0048	7	3	B315	57.62	848.38	32.8000	38.6619	3.8662E-02
018-0001	8	1	A0	68.92	658.78	3.5200	5.3432	5.3432E-03
018-0002	8	1	B0	68.93	693.66	1.8640	2.6872	2.6872E-03
018-0003	8	1	A45	68.98	679.47	1.0200	1.5012	1.5012E-03
018-0004	8	1	B45	69.02	678.15	1.5940	2.3505	2.3505E-03
018-0005	8	1	A90	69.05	679.67	1.4640	2.1540	2.1540E-03
018-0006	8	1	B90	69.08	643.83	0.6000	0.9319	9.3193E-04
018-0007	8	1	A135	69.13	685.13	0.4860	0.7094	7.0935E-04
018-0008	8	1	B135	69.17	659.59	0.3960	0.6004	6.0038E-04
018-0009	8	1	A180	69.22	684.08	1.6860	2.4646	2.4646E-03
018-0010	8	1	B180	69.25	682.45	0.5260	0.7708	7.7075E-04
018-0011	8	1	A225	69.28	667.97	1.7900	2.6797	2.6797E-03
018-0012	8	1	B225	69.32	679.71	0.8820	1.2976	1.2976E-03
018-0013	8	1	A270	69.37	662.69	1.4700	2.2182	2.2182E-03
018-0014	8	1	B270	69.38	669.44	0.8500	1.2697	1.2697E-03
018-0015	8	1	A315	68.87	693.99	1.6400	2.3631	2.3631E-03
018-0016	8	1	B315	68.83	689.04	1.2180	1.7677	1.7677E-03
018-0017	8	2	A0	68.42	660.00	4.8600	7.3636	7.3636E-03
018-0018	8	2	B0	68.43	659.00	0.7780	1.1806	1.1806E-03
018-0019	8	2	A45	68.48	708.42	0.3680	0.5195	5.1946E-04
018-0020	8	2	B45	68.50	NA	0.0000	NA	NA
018-0021	8	2	A90	68.55	673.42	0.6100	0.9058	9.0582E-04
018-0022	8	2	B90	68.57	688.80	0.3960	0.5749	5.7491E-04
018-0023	8	2	A135	68.63	656.00	0.7960	1.2134	1.2134E-03
018-0024	8	2	B135	68.65	704.12	0.2820	0.4005	4.0050E-04

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
018-0025	8	2	A180	68.68	686.70	3.1000	4.5143	4.5143E-03
018-0026	8	2	B180	68.72	670.35	1.8720	2.7926	2.7926E-03
018-0027	8	2	A225	68.75	684.60	3.6200	5.2878	5.2878E-03
018-0028	8	2	B225	68.77	651.00	2.1600	3.3180	3.3180E-03
018-0029	8	2	A270	68.82	667.27	5.3200	7.9727	7.9727E-03
018-0030	8	2	B270	68.83	650.00	3.0200	4.6462	4.6462E-03
018-0031	8	2	A315	68.88	666.25	0.7380	1.1077	1.1077E-03
018-0032	8	2	B315	68.90	649.00	0.7040	1.0847	1.0847E-03
018-0033	8	3	A0	68.47	682.67	18.0800	26.4843	2.6484E-02
018-0034	8	3	B0	68.50	701.67	6.1000	8.6935	8.6935E-03
018-0035	8	3	A45	67.97	697.36	3.7000	5.3058	5.3058E-03
018-0036	8	3	B45	67.92	700.19	3.3800	4.8273	4.8273E-03
018-0037	8	3	A90	68.00	694.92	3.6600	5.2668	5.2668E-03
018-0038	8	3	B90	68.03	708.01	1.7340	2.4491	2.4491E-03
018-0039	8	3	A135	68.08	706.69	2.8400	4.0187	4.0187E-03
018-0040	8	3	B135	68.12	698.72	2.1200	3.0341	3.0341E-03
018-0041	8	3	A180	68.15	688.80	11.7000	16.9861	1.6986E-02
018-0042	8	3	B180	68.18	683.10	3.9200	5.7385	5.7385E-03
018-0043	8	3	A225	68.23	697.73	24.8000	35.5438	3.5544E-02
018-0044	8	3	B225	68.27	676.78	11.6600	17.2287	1.7229E-02
018-0045	8	3	A270	68.30	703.30	55.0000	78.2028	7.8203E-02
018-0046	8	3	B270	68.33	693.23	28.0000	40.3909	4.0391E-02
018-0047	8	3	A315	68.38	688.59	22.2000	32.2398	3.2240E-02
018-0048	8	3	B315	68.42	692.06	7.7800	11.2417	1.1242E-02

10.3. Air concentration summary – Fowler, IN site

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
002-0001	1	1	A0	4.25	314.65	5.4400	17.2891	1.7289E-02
002-0002	1	1	B0	4.28	322.92	2.6000	8.0515	8.0515E-03
002-0003	1	1	A45	4.33	326.02	1.0640	3.2636	3.2636E-03
002-0004	1	1	B45	4.37	323.50	0.5660	1.7496	1.7496E-03
002-0005	1	1	A90	4.45	342.29	0.0000	0.0000	0.0000E+00
002-0006	1	1	B90	4.48	334.53	0.0000	0.0000	0.0000E+00
002-0007	1	1	A135	4.53	337.46	0.3500	1.0371	1.0371E-03
002-0008	1	1	B135	4.58	341.39	0.4440	1.3006	1.3006E-03
002-0009	1	1	A180	4.63	352.31	0.4420	1.2546	1.2546E-03
002-0010	1	1	B180	4.67	343.21	0.4540	1.3228	1.3228E-03
002-0011	1	1	A225	4.72	350.51	1.5960	4.5534	4.5534E-03
002-0012	1	1	B225	4.75	366.01	1.4160	3.8687	3.8687E-03
002-0013	1	1	A270	4.82	360.34	332.0000	921.3521	9.2135E-01
002-0014	1	1	B270	4.85	366.41	89.0000	242.8946	2.4289E-01
002-0015	1	1	A315	4.90	366.62	40.6000	110.7400	1.1074E-01
002-0016	1	1	B315	4.95	355.36	7.8600	22.1183	2.2118E-02
002-0017	1	2	A0	2.93	230.63	28.8000	124.8780	1.2488E-01
002-0018	1	2	B0	2.95	231.65	2.3400	10.1014	1.0101E-02
002-0019	1	2	A45	2.98	228.00	0.0000	0.0000	0.0000E+00
002-0020	1	2	B45	3.00	234.73	0.4400	1.8745	1.8745E-03
002-0021	1	2	A90	3.05	243.60	0.8980	3.6864	3.6864E-03
002-0022	1	2	B90	3.08	234.00	0.0000	0.0000	0.0000E+00
002-0023	1	2	A135	3.13	237.00	0.1502	0.6338	6.3376E-04

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
002-0024	1	2	B135	3.17	244.98	0.1852	0.7560	7.5600E-04
002-0025	1	2	A180	3.22	242.00	0.2340	0.9669	9.6694E-04
002-0026	1	2	B180	3.25	244.00	0.0000	0.0000	0.0000E+00
002-0027	1	2	A225	3.30	253.17	1.6440	6.4935	6.4935E-03
002-0028	1	2	B225	3.33	242.77	0.3300	1.3593	1.3593E-03
002-0029	1	2	A270	3.40	278.30	388.0000	1394.1789	1.3942E+00
002-0030	1	2	B270	3.43	255.00	96.6000	378.8235	3.7882E-01
002-0031	1	2	A315	3.50	265.47	60.4000	227.5167	2.2752E-01
002-0032	1	2	B315	3.53	267.53	59.2000	221.2877	2.2129E-01
002-0033	1	3	A0	5.47	368.02	9.7800	26.5749	2.6575E-02
002-0034	1	3	B0	5.53	375.22	3.0400	8.1018	8.1018E-03
002-0035	1	3	A45	4.52	314.17	0.0000	0.0000	0.0000E+00
002-0036	1	3	B45	4.58	322.77	0.0000	0.0000	0.0000E+00
002-0037	1	3	A90	4.65	321.94	0.3000	0.9319	9.3186E-04
002-0038	1	3	B90	4.72	325.88	0.0000	0.0000	0.0000E+00
002-0039	1	3	A135	4.78	334.17	0.3480	1.0414	1.0414E-03
002-0040	1	3	B135	4.88	334.91	0.0000	0.0000	0.0000E+00
002-0041	1	3	A180	4.95	346.04	1.4720	4.2539	4.2539E-03
002-0042	1	3	B180	5.03	359.09	0.2720	0.7575	7.5747E-04
002-0043	1	3	A225	5.10	360.86	4.0600	11.2511	1.1251E-02
002-0044	1	3	B225	5.17	371.57	0.7860	2.1153	2.1153E-03
002-0045	1	3	A270	5.23	359.12	55.0000	153.1500	1.5315E-01
002-0046	1	3	B270	5.28	386.52	30.6000	79.1672	7.9167E-02
002-0047	1	3	A315	5.35	372.95	25.8000	69.1791	6.9179E-02
002-0048	1	3	B315	5.42	369.42	11.9400	32.3212	3.2321E-02

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
003-0001	2	1	A0	10.25	376.56	1.7320	4.5995	4.5995E-03
003-0002	2	1	B0	10.27	376.95	1.2540	3.3267	3.3267E-03
003-0003	2	1	A45	10.30	374.83	0.6980	1.8622	1.8622E-03
003-0004	2	1	B45	10.35	363.49	0.9100	2.5035	2.5035E-03
003-0005	2	1	A90	10.40	384.49	0.7640	1.9871	1.9871E-03
003-0006	2	1	B90	10.43	373.60	0.3540	0.9475	9.4754E-04
003-0007	2	1	A135	10.48	363.25	1.4580	4.0138	4.0138E-03
003-0008	2	1	B135	10.52	369.88	0.4980	1.3464	1.3464E-03
003-0009	2	1	A180	10.55	364.34	0.2820	0.7740	7.7401E-04
003-0010	2	1	B180	10.60	370.06	0.3800	1.0269	1.0269E-03
003-0011	2	1	A225	10.67	373.24	0.4380	1.1735	1.1735E-03
003-0012	2	1	B225	10.72	364.09	0.3280	0.9009	9.0089E-04
003-0013	2	1	A270	10.77	378.96	3.9800	10.5026	1.0503E-02
003-0014	2	1	B270	10.80	385.38	4.1400	10.7426	1.0743E-02
003-0015	2	1	A315	10.85	377.17	3.4400	9.1205	9.1205E-03
003-0016	2	1	B315	10.88	367.57	0.6020	1.6378	1.6378E-03
003-0017	2	2	A0	8.93	369.00	7.2000	19.5122	1.9512E-02
003-0018	2	2	B0	8.95	369.00	3.1600	8.5637	8.5637E-03
003-0019	2	2	A45	8.98	369.00	0.7100	1.9241	1.9241E-03
003-0020	2	2	B45	9.00	369.00	1.0540	2.8564	2.8564E-03
003-0021	2	2	A90	9.05	369.00	0.4280	1.1599	1.1599E-03
003-0022	2	2	B90	9.10	351.98	0.3260	0.9262	9.2620E-04
003-0023	2	2	A135	9.15	370.03	0.5640	1.5242	1.5242E-03
003-0024	2	2	B135	9.17	378.00	0.7540	1.9947	1.9947E-03
003-0025	2	2	A180	9.22	360.00	0.2600	0.7222	7.2222E-04

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
003-0026	2	2	B180	9.25	360.00	0.3460	0.9611	9.6111E-04
003-0027	2	2	A225	9.30	369.00	0.4180	1.1328	1.1328E-03
003-0028	2	2	B225	9.33	351.00	0.2480	0.7066	7.0655E-04
003-0029	2	2	A270	9.38	359.00	15.1600	42.2284	4.2228E-02
003-0030	2	2	B270	9.42	367.98	6.6400	18.0447	1.8045E-02
003-0031	2	2	A315	9.47	366.95	11.3000	30.7944	3.0794E-02
003-0032	2	2	B315	9.50	366.95	7.9200	21.5833	2.1583E-02
003-0033	2	3	A0	11.17	349.01	4.3000	12.3205	1.2321E-02
003-0034	2	3	B0	11.23	349.35	2.2000	6.2974	6.2974E-03
003-0035	2	3	A45	10.47	366.10	0.2980	0.8140	8.1398E-04
003-0036	2	3	B45	10.52	359.20	0.3020	0.8407	8.4075E-04
003-0037	2	3	A90	10.57	362.46	0.2320	0.6401	6.4008E-04
003-0038	2	3	B90	10.62	357.72	0.3440	0.9617	9.6165E-04
003-0039	2	3	A135	10.67	365.53	0.3400	0.9302	9.3015E-04
003-0040	2	3	B135	10.72	368.90	0.4340	1.1765	1.1765E-03
003-0041	2	3	A180	10.78	362.42	0.9480	2.6157	2.6157E-03
003-0042	2	3	B180	10.82	346.13	0.3340	0.9649	9.6495E-04
003-0043	2	3	A225	10.88	350.99	1.3140	3.7437	3.7437E-03
003-0044	2	3	B225	10.93	345.83	0.5820	1.6829	1.6829E-03
003-0045	2	3	A270	10.98	359.66	12.6200	35.0885	3.5088E-02
003-0046	2	3	B270	11.03	341.90	11.6000	33.9285	3.3929E-02
003-0047	2	3	A315	11.08	357.07	7.2400	20.2760	2.0276E-02
003-0048	2	3	B315	11.12	350.38	3.7600	10.7312	1.0731E-02
004-0001	3	1	A0	16.25	375.30	0.3700	0.9859	9.8588E-04
004-0002	3	1	B0	16.27	375.30	0.3960	1.0552	1.0552E-03

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
004-0003	3	1	A45	16.30	368.64	0.0000	0.0000	0.0000E+00
004-0004	3	1	B45	16.33	362.23	0.0000	0.0000	0.0000E+00
004-0005	3	1	A90	16.40	380.52	0.1348	0.3543	3.5425E-04
004-0006	3	1	B90	16.43	378.54	0.3540	0.9352	9.3517E-04
004-0007	3	1	A135	16.50	372.19	0.0000	0.0000	0.0000E+00
004-0008	3	1	B135	16.53	368.94	0.0000	0.0000	0.0000E+00
004-0009	3	1	A180	16.58	360.71	0.4060	1.1255	1.1255E-03
004-0010	3	1	B180	16.63	381.19	0.0000	0.0000	0.0000E+00
004-0011	3	1	A225	16.70	380.10	0.2060	0.5420	5.4196E-04
004-0012	3	1	B225	16.73	362.41	0.0000	0.0000	0.0000E+00
004-0013	3	1	A270	16.82	376.61	8.1000	21.5075	2.1508E-02
004-0014	3	1	B270	16.85	382.60	1.5800	4.1296	4.1296E-03
004-0015	3	1	A315	16.90	374.25	0.7540	2.0147	2.0147E-03
004-0016	3	1	B315	16.93	372.26	0.9820	2.6380	2.6380E-03
004-0017	3	2	A0	14.93	360.00	1.4760	4.1000	4.1000E-03
004-0018	3	2	B0	14.95	360.00	0.7860	2.1833	2.1833E-03
004-0019	3	2	A45	15.00	370.03	0.3820	1.0324	1.0324E-03
004-0020	3	2	B45	15.03	362.00	0.2000	0.5525	5.5249E-04
004-0021	3	2	A90	15.07	361.00	0.3260	0.9030	9.0305E-04
004-0022	3	2	B90	15.10	360.00	0.0000	0.0000	0.0000E+00
004-0023	3	2	A135	15.15	369.00	0.0000	0.0000	0.0000E+00
004-0024	3	2	B135	15.18	370.02	0.0000	0.0000	0.0000E+00
004-0025	3	2	A180	15.23	361.00	0.0000	0.0000	0.0000E+00
004-0026	3	2	B180	15.27	361.00	0.0000	0.0000	0.0000E+00
004-0027	3	2	A225	15.32	361.00	0.0000	0.0000	0.0000E+00

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
004-0028	3	2	B225	15.35	361.00	0.0000	0.0000	0.0000E+00
004-0029	3	2	A270	15.38	360.00	2.1600	6.0000	6.0000E-03
004-0030	3	2	B270	15.42	360.00	1.3760	3.8222	3.8222E-03
004-0031	3	2	A315	15.47	360.00	2.1600	6.0000	6.0000E-03
004-0032	3	2	B315	15.50	360.00	0.9500	2.6389	2.6389E-03
004-0033	3	3	A0	17.40	375.68	0.9440	2.5128	2.5128E-03
004-0034	3	3	B0	17.45	375.98	0.2560	0.6809	6.8088E-04
004-0035	3	3	A45	16.45	367.44	0.0000	0.0000	0.0000E+00
004-0036	3	3	B45	16.53	375.08	0.1574	0.4196	4.1964E-04
004-0037	3	3	A90	16.58	362.08	0.0000	0.0000	0.0000E+00
004-0038	3	3	B90	16.65	363.09	0.1428	0.3933	3.9330E-04
004-0039	3	3	A135	16.73	378.38	0.1504	0.3975	3.9749E-04
004-0040	3	3	B135	16.78	380.38	0.0000	0.0000	0.0000E+00
004-0041	3	3	A180	16.85	365.09	0.3840	1.0518	1.0518E-03
004-0042	3	3	B180	16.92	365.45	0.0936	0.2561	2.5612E-04
004-0043	3	3	A225	16.98	370.39	1.2220	3.2992	3.2992E-03
004-0044	3	3	B225	17.03	379.54	0.3460	0.9116	9.1163E-04
004-0045	3	3	A270	17.10	367.37	5.9600	16.2236	1.6224E-02
004-0046	3	3	B270	17.20	377.77	3.6600	9.6884	9.6884E-03
004-0047	3	3	A315	17.25	378.33	0.9340	2.4688	2.4688E-03
004-0048	3	3	B315	17.32	373.49	1.3440	3.5985	3.5985E-03
005-0001	4	1	A0	22.17	360.50	3.3000	9.1539	9.1539E-03
005-0002	4	1	B0	22.20	357.42	1.1720	3.2790	3.2790E-03
005-0003	4	1	A45	22.25	360.75	0.3980	1.1033	1.1033E-03
005-0004	4	1	B45	22.28	358.07	0.6660	1.8600	1.8600E-03

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
005-0005	4	1	A90	22.33	373.98	0.7380	1.9734	1.9734E-03
005-0006	4	1	B90	22.38	364.85	0.3740	1.0251	1.0251E-03
005-0007	4	1	A135	22.45	357.36	0.3160	0.8843	8.8427E-04
005-0008	4	1	B135	22.50	360.51	0.0000	0.0000	0.0000E+00
005-0009	4	1	A180	22.55	368.02	0.2940	0.7989	7.9886E-04
005-0010	4	1	B180	22.58	365.57	0.4960	1.3568	1.3568E-03
005-0011	4	1	A225	22.67	365.52	0.8400	2.2981	2.2981E-03
005-0012	4	1	B225	22.72	361.69	0.6960	1.9243	1.9243E-03
005-0013	4	1	A270	22.75	359.92	29.2000	81.1300	8.1130E-02
005-0014	4	1	B270	22.78	372.73	33.0000	88.5355	8.8535E-02
005-0015	4	1	A315	22.83	360.81	11.8400	32.8154	3.2815E-02
005-0016	4	1	B315	22.87	359.38	5.2400	14.5806	1.4581E-02
005-0017	4	2	A0	20.93	360.00	11.5600	32.1111	3.2111E-02
005-0018	4	2	B0	20.97	361.00	4.9800	13.7950	1.3795E-02
005-0019	4	2	A45	21.02	370.02	0.6880	1.8593	1.8593E-03
005-0020	4	2	B45	21.05	361.00	1.2520	3.4681	3.4681E-03
005-0021	4	2	A90	21.08	351.97	0.5720	1.6251	1.6251E-03
005-0022	4	2	B90	21.12	342.95	0.8760	2.5543	2.5543E-03
005-0023	4	2	A135	21.15	342.00	0.6920	2.0234	2.0234E-03
005-0024	4	2	B135	21.18	378.00	0.5080	1.3439	1.3439E-03
005-0025	4	2	A180	21.25	361.00	0.9760	2.7036	2.7036E-03
005-0026	4	2	B180	21.28	361.00	0.5500	1.5235	1.5235E-03
005-0027	4	2	A225	21.33	361.00	1.0240	2.8366	2.8366E-03
005-0028	4	2	B225	21.37	379.05	0.8580	2.2636	2.2636E-03
005-0029	4	2	A270	21.42	362.00	41.2000	113.8122	1.1381E-01

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
005-0030	4	2	B270	21.45	362.00	34.0000	93.9227	9.3923E-02
005-0031	4	2	A315	21.50	362.00	15.3000	42.2652	4.2265E-02
005-0032	4	2	B315	21.53	362.00	15.8000	43.6464	4.3646E-02
005-0033	4	3	A0	23.20	369.05	3.6400	9.8631	9.8631E-03
005-0034	4	3	B0	23.25	350.96	0.6820	1.9433	1.9433E-03
005-0035	4	3	A45	22.47	384.46	1.7660	4.5934	4.5934E-03
005-0036	4	3	B45	22.50	362.65	0.6960	1.9192	1.9192E-03
005-0037	4	3	A90	22.55	376.26	0.6880	1.8285	1.8285E-03
005-0038	4	3	B90	22.60	373.24	0.5660	1.5164	1.5164E-03
005-0039	4	3	A135	22.65	368.31	0.3540	0.9611	9.6114E-04
005-0040	4	3	B135	22.70	357.13	0.2400	0.6720	6.7202E-04
005-0041	4	3	A180	22.77	371.86	0.8500	2.2858	2.2858E-03
005-0042	4	3	B180	22.82	359.13	0.6280	1.7487	1.7487E-03
005-0043	4	3	A225	22.88	357.54	1.5680	4.3855	4.3855E-03
005-0044	4	3	B225	22.92	366.06	0.4800	1.3113	1.3113E-03
005-0045	4	3	A270	22.98	359.53	17.6400	49.0640	4.9064E-02
005-0046	4	3	B270	23.02	351.09	12.9000	36.7423	3.6742E-02
005-0047	4	3	A315	23.07	359.82	10.1600	28.2364	2.8236E-02
005-0048	4	3	B315	23.12	366.79	4.9000	13.3591	1.3359E-02
006-0001	5	1	A0	34.17	732.60	0.3480	0.4750	4.7502E-04
006-0002	5	1	B0	34.20	728.64	0.3040	0.4172	4.1722E-04
006-0003	5	1	A45	34.23	725.47	0.1826	0.2517	2.5170E-04
006-0004	5	1	B45	34.27	722.60	0.0000	0.0000	0.0000E+00
006-0005	5	1	A90	34.33	738.72	0.5220	0.7066	7.0663E-04
006-0006	5	1	B90	34.37	721.88	0.2860	0.3962	3.9619E-04

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
006-0007	5	1	A135	34.42	714.09	0.0000	0.0000	0.0000E+00
006-0008	5	1	B135	34.48	726.55	0.0000	0.0000	0.0000E+00
006-0009	5	1	A180	34.53	723.67	0.2660	0.3676	3.6757E-04
006-0010	5	1	B180	34.57	733.02	0.0000	0.0000	0.0000E+00
006-0011	5	1	A225	34.62	722.74	0.2560	0.3542	3.5421E-04
006-0012	5	1	B225	34.65	707.05	0.0000	0.0000	0.0000E+00
006-0013	5	1	A270	34.70	723.09	2.5800	3.5680	3.5680E-03
006-0014	5	1	B270	34.73	728.83	0.8280	1.1361	1.1361E-03
006-0015	5	1	A315	34.78	718.08	0.4080	0.5682	5.6819E-04
006-0016	5	1	B315	34.85	712.13	0.8580	1.2048	1.2048E-03
006-0017	5	2	A0	32.93	720.00	0.9460	1.3139	1.3139E-03
006-0018	5	2	B0	32.95	719.00	0.4920	0.6843	6.8428E-04
006-0019	5	2	A45	32.98	700.05	0.1908	0.2726	2.7255E-04
006-0020	5	2	B45	33.02	735.95	0.2780	0.3777	3.7774E-04
006-0021	5	2	A90	33.07	736.97	0.3620	0.4912	4.9120E-04
006-0022	5	2	B90	33.08	718.00	0.2020	0.2813	2.8134E-04
006-0023	5	2	A135	33.13	719.00	0.2120	0.2949	2.9485E-04
006-0024	5	2	B135	33.17	754.95	0.1556	0.2061	2.0611E-04
006-0025	5	2	A180	33.22	718.00	0.0000	0.0000	0.0000E+00
006-0026	5	2	B180	33.23	717.00	0.0000	0.0000	0.0000E+00
006-0027	5	2	A225	33.28	717.00	0.0000	0.0000	0.0000E+00
006-0028	5	2	B225	33.32	717.00	0.0000	0.0000	0.0000E+00
006-0029	5	2	A270	33.37	699.08	2.8400	4.0625	4.0625E-03
006-0030	5	2	B270	33.40	717.00	4.8000	6.6946	6.6946E-03
006-0031	5	2	A315	33.43	698.10	1.2600	1.8049	1.8049E-03

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
006-0032	5	2	B315	33.47	716.00	0.4140	0.5782	5.7821E-04
006-0033	5	3	A0	35.13	759.32	32.0000	42.1431	4.2143E-02
006-0034	5	3	B0	35.18	722.80	16.5200	22.8555	2.2855E-02
006-0035	5	3	A45	34.43	735.59	14.3000	19.4402	1.9440E-02
006-0036	5	3	B45	34.50	731.52	7.9600	10.8815	1.0881E-02
006-0037	5	3	A90	34.55	738.36	34.0000	46.0480	4.6048E-02
006-0038	5	3	B90	34.60	757.80	20.4000	26.9200	2.6920E-02
006-0039	5	3	A135	34.65	735.12	15.9800	21.7379	2.1738E-02
006-0040	5	3	B135	34.70	729.72	6.0400	8.2771	8.2771E-03
006-0041	5	3	A180	34.77	769.68	4.7800	6.2104	6.2104E-03
006-0042	5	3	B180	34.80	757.11	0.4040	0.5336	5.3361E-04
006-0043	5	3	A225	34.85	730.56	1.0240	1.4017	1.4017E-03
006-0044	5	3	B225	34.90	756.39	0.4140	0.5473	5.4734E-04
006-0045	5	3	A270	34.95	735.23	26.6000	36.1791	3.6179E-02
006-0046	5	3	B270	34.98	749.23	15.1200	20.1806	2.0181E-02
006-0047	5	3	A315	35.03	732.00	1.2260	1.6749	1.6749E-03
006-0048	5	3	B315	35.08	733.08	11.0600	15.0871	1.5087E-02
007-0001	6	1	A0	46.17	735.12	0.0000	0.0000	0.0000E+00
007-0002	6	1	B0	46.20	721.51	0.0000	0.0000	0.0000E+00
007-0003	6	1	A45	46.27	723.23	0.0000	0.0000	0.0000E+00
007-0004	6	1	B45	46.32	715.48	0.0000	0.0000	0.0000E+00
007-0005	6	1	A90	46.38	752.64	0.0468	0.0622	6.2181E-05
007-0006	6	1	B90	46.42	729.15	0.0075	0.0103	1.0313E-05
007-0007	6	1	A135	46.48	789.88	0.0197	0.0249	2.4890E-05
007-0008	6	1	B135	46.53	731.31	0.0000	0.0000	0.0000E+00

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
007-0009	6	1	A180	46.57	737.88	0.0000	0.0000	0.0000E+00
007-0010	6	1	B180	46.60	745.46	0.0000	0.0000	0.0000E+00
007-0011	6	1	A225	46.65	736.80	0.0000	0.0000	0.0000E+00
007-0012	6	1	B225	46.70	751.92	0.0000	0.0000	0.0000E+00
007-0013	6	1	A270	46.75	727.34	4.5200	6.2144	6.2144E-03
007-0014	6	1	B270	46.80	741.38	0.2540	0.3426	3.4261E-04
007-0015	6	1	A315	46.85	744.27	0.0336	0.0451	4.5145E-05
007-0016	6	1	B315	46.88	727.41	0.7240	0.9953	9.9531E-04
007-0017	6	2	A0	44.93	738.00	0.1388	0.1881	1.8808E-04
007-0018	6	2	B0	44.95	702.00	0.0013	0.0018	1.8433E-06
007-0019	6	2	A45	44.98	720.00	0.0000	0.0000	0.0000E+00
007-0020	6	2	B45	45.02	720.00	0.0141	0.0196	1.9556E-05
007-0021	6	2	A90	45.07	738.00	0.0570	0.0772	7.7236E-05
007-0022	6	2	B90	45.10	721.00	0.0000	0.0000	0.0000E+00
007-0023	6	2	A135	45.15	775.08	0.0000	0.0000	0.0000E+00
007-0024	6	2	B135	45.18	739.02	0.0000	0.0000	0.0000E+00
007-0025	6	2	A180	45.25	722.00	0.0000	0.0000	0.0000E+00
007-0026	6	2	B180	45.28	723.00	0.0000	0.0000	0.0000E+00
007-0027	6	2	A225	45.32	740.05	0.0000	0.0000	0.0000E+00
007-0028	6	2	B225	45.37	759.15	0.2020	0.2661	2.6609E-04
007-0029	6	2	A270	45.42	777.23	1.7480	2.2490	2.2490E-03
007-0030	6	2	B270	45.45	741.07	2.5400	3.4275	3.4275E-03
007-0031	6	2	A315	45.48	741.08	1.1620	1.5680	1.5680E-03
007-0032	6	2	B315	45.52	723.00	0.3860	0.5339	5.3389E-04
007-0033	6	3	A0	47.28	798.25	6.1200	7.6667	7.6667E-03

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
007-0034	6	3	B0	47.35	761.03	2.6000	3.4164	3.4164E-03
007-0035	6	3	A45	46.45	768.23	11.4400	14.8915	1.4891E-02
007-0036	6	3	B45	46.50	734.40	5.0400	6.8627	6.8627E-03
007-0037	6	3	A90	46.57	745.51	20.8000	27.9002	2.7900E-02
007-0038	6	3	B90	46.62	740.83	14.6400	19.7617	1.9762E-02
007-0039	6	3	A135	46.68	740.41	3.6200	4.8892	4.8892E-03
007-0040	6	3	B135	46.73	744.02	1.5540	2.0887	2.0887E-03
007-0041	6	3	A180	46.80	759.18	1.5140	1.9942	1.9942E-03
007-0042	6	3	B180	46.85	743.61	0.2000	0.2690	2.6896E-04
007-0043	6	3	A225	46.93	728.26	0.3420	0.4696	4.6961E-04
007-0044	6	3	B225	46.98	750.38	0.1792	0.2388	2.3881E-04
007-0045	6	3	A270	47.07	731.73	2.2800	3.1159	3.1159E-03
007-0046	6	3	B270	47.12	751.30	1.4680	1.9540	1.9540E-03
007-0047	6	3	A315	47.18	716.61	0.2200	0.3070	3.0700E-04
007-0048	6	3	B315	47.23	750.51	0.5400	0.7195	7.1952E-04
008-0001	7	1	A0	58.17	753.12	0.0330	0.0438	4.3818E-05
008-0002	7	1	B0	58.20	757.08	0.0000	0.0000	0.0000E+00
008-0003	7	1	A45	58.27	744.84	0.0220	0.0295	2.9537E-05
008-0004	7	1	B45	58.30	756.75	0.0000	0.0000	0.0000E+00
008-0005	7	1	A90	58.37	764.30	0.0724	0.0947	9.4728E-05
008-0006	7	1	B90	58.40	734.10	0.0147	0.0201	2.0052E-05
008-0007	7	1	A135	58.45	716.56	0.0000	0.0000	0.0000E+00
008-0008	7	1	B135	58.48	735.64	0.0310	0.0421	4.2140E-05
008-0009	7	1	A180	58.53	755.34	0.0076	0.0101	1.0115E-05
008-0010	7	1	B180	58.57	749.23	0.0000	0.0000	0.0000E+00

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
008-0011	7	1	A225	58.63	740.57	0.1980	0.2674	2.6736E-04
008-0012	7	1	B225	58.67	747.08	0.0964	0.1290	1.2904E-04
008-0013	7	1	A270	58.72	740.26	1.0180	1.3752	1.3752E-03
008-0014	7	1	B270	58.75	747.11	2.3200	3.1053	3.1053E-03
008-0015	7	1	A315	58.80	743.89	0.5000	0.6721	6.7214E-04
008-0016	7	1	B315	58.83	739.59	0.1692	0.2288	2.2878E-04
008-0017	7	2	A0	56.93	738.00	0.4600	0.6233	6.2331E-04
008-0018	7	2	B0	56.95	738.00	0.3600	0.4878	4.8780E-04
008-0019	7	2	A45	56.98	738.00	0.2580	0.3496	3.4959E-04
008-0020	7	2	B45	57.02	738.00	0.0412	0.0558	5.5827E-05
008-0021	7	2	A90	57.05	736.98	0.1480	0.2008	2.0082E-04
008-0022	7	2	B90	57.08	736.97	0.0058	0.0079	7.9243E-06
008-0023	7	2	A135	57.13	790.90	0.0000	0.0000	0.0000E+00
008-0024	7	2	B135	57.17	736.98	0.0816	0.1107	1.1072E-04
008-0025	7	2	A180	57.22	718.00	0.0108	0.0150	1.5014E-05
008-0026	7	2	B180	57.25	718.00	0.1064	0.1482	1.4819E-04
008-0027	7	2	A225	57.28	735.95	0.0000	0.0000	0.0000E+00
008-0028	7	2	B225	57.32	681.15	0.0000	0.0000	0.0000E+00
008-0029	7	2	A270	57.37	717.00	5.0600	7.0572	7.0572E-03
008-0030	7	2	B270	57.40	734.92	2.7400	3.7283	3.7283E-03
008-0031	7	2	A315	57.43	734.93	0.5280	0.7184	7.1844E-04
008-0032	7	2	B315	57.47	717.00	0.1512	0.2109	2.1088E-04
008-0033	7	3	A0	59.20	729.66	3.4600	4.7420	4.7420E-03
008-0034	7	3	B0	59.25	748.99	1.9860	2.6516	2.6516E-03
008-0035	7	3	A45	58.52	796.76	4.9400	6.2001	6.2001E-03

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
008-0036	7	3	B45	58.58	765.60	2.0200	2.6385	2.6385E-03
008-0037	7	3	A90	58.63	773.59	11.0400	14.2711	1.4271E-02
008-0038	7	3	B90	58.68	754.05	7.0400	9.3363	9.3363E-03
008-0039	7	3	A135	58.72	760.99	5.4600	7.1749	7.1749E-03
008-0040	7	3	B135	58.77	765.32	2.0000	2.6133	2.6133E-03
008-0041	7	3	A180	58.82	763.90	1.9840	2.5972	2.5972E-03
008-0042	7	3	B180	58.85	775.80	0.3220	0.4151	4.1506E-04
008-0043	7	3	A225	58.90	767.54	0.3700	0.4821	4.8206E-04
008-0044	7	3	B225	58.93	805.55	0.3300	0.4097	4.0966E-04
008-0045	7	3	A270	59.00	777.93	7.2000	9.2553	9.2553E-03
008-0046	7	3	B270	59.03	797.58	2.6800	3.3602	3.3602E-03
008-0047	7	3	A315	59.10	807.24	1.0620	1.3156	1.3156E-03
008-0048	7	3	B315	59.15	735.38	2.5400	3.4540	3.4540E-03
009-0001	8	1	A0	70.17	757.08	0.0324	0.0428	4.2796E-05
009-0002	8	1	B0	70.20	756.00	0.0000	0.0000	0.0000E+00
009-0003	8	1	A45	70.23	740.98	0.0334	0.0451	4.5076E-05
009-0004	8	1	B45	70.27	721.23	0.1312	0.1819	1.8191E-04
009-0005	8	1	A90	70.32	760.38	0.1434	0.1886	1.8859E-04
009-0006	8	1	B90	70.33	724.59	0.0000	0.0000	0.0000E+00
009-0007	8	1	A135	70.37	716.43	0.0029	0.0040	3.9920E-06
009-0008	8	1	B135	70.40	736.09	0.0000	0.0000	0.0000E+00
009-0009	8	1	A180	70.43	733.28	0.0000	0.0000	0.0000E+00
009-0010	8	1	B180	70.45	750.79	0.0000	0.0000	0.0000E+00
009-0011	8	1	A225	70.50	737.28	0.0000	0.0000	0.0000E+00
009-0012	8	1	B225	70.52	737.31	0.0226	0.0307	3.0652E-05

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
009-0013	8	1	A270	70.57	734.11	0.1012	0.1379	1.3785E-04
009-0014	8	1	B270	70.58	747.28	0.7380	0.9876	9.8759E-04
009-0015	8	1	A315	70.62	743.74	0.3720	0.5002	5.0017E-04
009-0016	8	1	B315	70.65	732.40	0.2100	0.2867	2.8673E-04
009-0017	8	2	A0	68.98	741.08	0.0000	0.0000	0.0000E+00
009-0018	8	2	B0	69.00	741.08	0.0000	0.0000	0.0000E+00
009-0019	8	2	A45	69.03	759.15	0.0000	0.0000	0.0000E+00
009-0020	8	2	B45	69.05	740.05	0.0000	0.0000	0.0000E+00
009-0021	8	2	A90	69.08	740.05	0.0000	0.0000	0.0000E+00
009-0022	8	2	B90	69.10	739.03	0.0000	0.0000	0.0000E+00
009-0023	8	2	A135	69.13	702.00	0.0000	0.0000	0.0000E+00
009-0024	8	2	B135	69.15	736.98	0.0000	0.0000	0.0000E+00
009-0025	8	2	A180	69.18	718.00	0.0000	0.0000	0.0000E+00
009-0026	8	2	B180	69.20	717.00	0.0000	0.0000	0.0000E+00
009-0027	8	2	A225	69.22	716.00	0.0000	0.0000	0.0000E+00
009-0028	8	2	B225	69.23	732.87	0.0000	0.0000	0.0000E+00
009-0029	8	2	A270	69.27	731.85	0.2160	0.2951	2.9514E-04
009-0030	8	2	B270	69.28	713.00	0.1976	0.2771	2.7714E-04
009-0031	8	2	A315	69.33	731.85	0.1756	0.2399	2.3994E-04
009-0032	8	2	B315	69.35	713.00	0.0000	0.0000	0.0000E+00
009-0033	8	3	A0	70.98	714.42	2.5600	3.5833	3.5833E-03
009-0034	8	3	B0	71.02	734.59	1.3940	1.8976	1.8976E-03
009-0035	8	3	A45	70.50	709.29	0.3000	0.4230	4.2296E-04
009-0036	8	3	B45	70.52	751.80	1.6580	2.2054	2.2054E-03
009-0037	8	3	A90	70.57	738.55	2.2000	2.9788	2.9788E-03

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (ng/m^3)	2,4-D conc ($\mu g/m^3$)
009-0038	8	3	B90	70.60	752.18	1.4860	1.9756	1.9756E-03
009-0039	8	3	A135	70.63	752.18	0.8180	1.0875	1.0875E-03
009-0040	8	3	B135	70.67	755.41	0.0000	0.0000	0.0000E+00
009-0041	8	3	A180	70.70	727.62	0.3560	0.4893	4.8927E-04
009-0042	8	3	B180	70.73	730.11	0.1928	0.2641	2.6407E-04
009-0043	8	3	A225	70.77	762.55	0.3320	0.4354	4.3538E-04
009-0044	8	3	B225	70.78	725.58	0.1796	0.2475	2.4753E-04
009-0045	8	3	A270	70.83	732.37	1.1500	1.5703	1.5703E-03
009-0046	8	3	B270	70.87	718.88	0.8400	1.1685	1.1685E-03
009-0047	8	3	A315	70.92	723.53	0.6020	0.8320	8.3203E-04
009-0048	8	3	B315	70.93	728.56	0.4260	0.5847	5.8471E-04

11. APPENDIX D – 2011 ANALYTICAL RESULTS

11.1. Analytical report from PSL

11.2. Air concentration summary – Little Rock, AR site

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
30-0001	1	1	A0	4.1	300	0.515	1.7167
30-0002	1	1	B0	4.2	305	0.0521	0.1708
30-0003	1	1	A45	4.2	338	0.1221	0.3616
30-0004	1	1	B45	4.3	331	0.0646	0.1953
30-0005	1	1	A90	4.4	333	0.00786	0.0236
30-0006	1	1	B90	4.4	351	0.00394	0.0112
30-0007	1	1	A135	4.5	339	0.000521	0.0015
30-0008	1	1	B135	4.5	342	0.000682	0.0020
30-0009	1	1	A180	4.6	330	0.001027	0.0031
30-0010	1	1	B180	4.6	350	0.000338	0.0010
30-0011	1	1	A225	4.7	354	0.001691	0.0048
30-0012	1	1	B225	4.7	357	0.000548	0.0015
30-0013	1	1	A270	4.8	362	0.00551	0.0152
30-0014	1	1	B270	4.9	364	0.00565	0.0155
30-0015	1	1	A315	4.9	368	0.01074	0.0292
30-0016	1	1	B315	5.0	373	0.000502	0.0013
30-0017	1	2	A0	3.0	242	0.1171	0.4830
30-0018	1	2	B0	3.0	243	0.0666	0.2743
30-0019	1	2	A45	3.1	251	0.1058	0.4221
30-0020	1	2	B45	3.1	248	0.0771	0.3107
30-0021	1	2	A90	3.2	256	0.0325	0.1270
30-0022	1	2	B90	3.2	255	0.0278	0.1092
30-0023	1	2	A135	3.3	261	0.000491	0.0019

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
30-0024	1	2	B135	3.4	263	0.000514	0.0020
30-0025	1	2	A180	3.4	277	0.000331	0.0012
30-0026	1	2	B180	3.5	286	0.0008	0.0028
30-0027	1	2	A225	3.5	293	0.001608	0.0055
30-0028	1	2	B225	3.6	287	0.000625	0.0022
30-0029	1	2	A270	3.6	276	0.00498	0.0180
30-0030	1	2	B270	3.7	286	0.001105	0.0039
30-0031	1	2	A315	3.7	289	0.00324	0.0112
30-0032	1	2	B315	3.8	281	0.002084	0.0074
30-0033	1	3	A0	2.2	184	0.0333	0.1812
30-0034	1	3	B0	2.2	182	0.01973	0.1085
30-0035	1	3	A45	2.3	190	0.0805	0.4235
30-0036	1	3	B45	2.3	191	0.0526	0.2761
30-0037	1	3	A90	2.4	198	0.0431	0.2175
30-0038	1	3	B90	2.4	199	0.01031	0.0518
30-0039	1	3	A135	2.5	201	0.001706	0.0085
30-0040	1	3	B135	2.5	212	0.000431	0.0020
30-0041	1	3	A180	2.6	213	0.000454	0.0021
30-0042	1	3	B180	2.6	216	0.000605	0.0028
30-0043	1	3	A225	2.7	225	0.000621	0.0028
30-0044	1	3	B225	2.7	219	0.00038	0.0017
30-0045	1	3	A270	2.8	230	0.001106	0.0048
30-0046	1	3	B270	2.8	229	0.00116	0.0051
30-0047	1	3	A315	2.9	229	0.001048	0.0046
30-0048	1	3	B315	3.0	233	0.000385	0.0017

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
30-0049	1	4	A0	1.6	123	0.01339	0.1091
30-0050	1	4	B0	1.7	126	0.001702	0.0135
30-0051	1	4	A45	1.7	126	0.0239	0.1891
30-0052	1	4	B45	1.8	136	0.01142	0.0840
30-0053	1	4	A90	1.9	143	0.0295	0.2056
30-0054	1	4	B90	1.9	145	0.01008	0.0696
30-0055	1	4	A135	2.0	154	0.000797	0.0052
30-0056	1	4	B135	2.1	155	0.000419	0.0027
30-0057	1	4	A180	2.2	161	0.000885	0.0055
30-0058	1	4	B180	2.2	164	0.001787	0.0109
30-0059	1	4	A225	2.3	175	0.000687	0.0039
30-0060	1	4	B225	2.4	174	0.000748	0.0043
30-0061	1	4	A270	2.4	184	0.001822	0.0099
30-0062	1	4	B270	2.5	187	0.000771	0.0041
30-0063	1	4	A315	2.5	185	0.00414	0.0223
30-0064	1	4	B315	2.6	191	0.001339	0.0070
31-0001	2	1	A0	10.1	360	0.00401	0.0111
31-0002	2	1	B0	10.1	357	0.001613	0.0045
31-0003	2	1	A45	10.2	358	0.00547	0.0153
31-0004	2	1	B45	10.2	352	0.00173	0.0049
31-0005	2	1	A90	10.3	354	0.001051	0.0030
31-0006	2	1	B90	10.3	355	0.001063	0.0030
31-0007	2	1	A135	10.4	354	0.00824	0.0233
31-0008	2	1	B135	10.4	354	0.000646	0.0018
31-0009	2	1	A180	10.5	354	0.00369	0.0104

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
31-0010	2	1	B180	10.5	354	0.000646	0.0018
31-0011	2	1	A225	10.6	354	0.0043	0.0121
31-0012	2	1	B225	10.6	372	0.001381	0.0037
31-0013	2	1	A270	10.7	352	0.00421	0.0120
31-0014	2	1	B270	10.7	371	0.00272	0.0073
31-0015	2	1	A315	10.8	354	0.00639	0.0181
31-0016	2	1	B315	10.9	352	0.00671	0.0191
31-0017	2	2	A0	9.0	384	0.01549	0.0403
31-0018	2	2	B0	9.0	382	0.00936	0.0245
31-0019	2	2	A45	9.1	386	0.0198	0.0513
31-0020	2	2	B45	9.1	384	0.00865	0.0225
31-0021	2	2	A90	9.2	381	0.00968	0.0254
31-0022	2	2	B90	9.2	375	0.00505	0.0135
31-0023	2	2	A135	9.3	378	0.000626	0.0017
31-0024	2	2	B135	9.5	378	0.000803	0.0021
31-0025	2	2	A180	9.5	385	0.000593	0.0015
31-0026	2	2	B180	9.6	376	0.00127	0.0034
31-0027	2	2	A225	9.7	372	0.000656	0.0018
31-0028	2	2	B225	9.7	382	0.000621	0.0016
31-0029	2	2	A270	9.8	393	0.00879	0.0224
31-0030	2	2	B270	9.8	391	0.00393	0.0100
31-0031	2	2	A315	9.8	393	0.00793	0.0202
31-0032	2	2	B315	9.9	375	0.00449	0.0120
31-0033	2	3	A0	8.2	378	0.01065	0.0282
31-0034	2	3	B0	8.2	365	0.00569	0.0156

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
31-0035	2	3	A45	8.3	375	0.001941	0.0052
31-0036	2	3	B45	8.3	358	0.00362	0.0101
31-0037	2	3	A90	8.3	363	0.01466	0.0403
31-0038	2	3	B90	8.4	366	0.001751	0.0048
31-0039	2	3	A135	8.5	354	0.000847	0.0024
31-0040	2	3	B135	8.5	364	0.000989	0.0027
31-0041	2	3	A180	8.6	360	0.000878	0.0024
31-0042	2	3	B180	8.6	360	0.00092	0.0026
31-0043	2	3	A225	8.7	368	0.00089	0.0024
31-0044	2	3	B225	8.8	449	0.000662	0.0015
31-0045	2	3	A270	8.9	379	0.00434	0.0114
31-0046	2	3	B270	8.9	378	0.001734	0.0046
31-0047	2	3	A315	9.0	385	0.0055	0.0143
31-0048	2	3	B315	9.0	383	0.00317	0.0083
31-0049	2	4	A0	7.6	368	0.0428	0.1164
31-0050	2	4	B0	7.6	367	0.01999	0.0545
31-0051	2	4	A45	7.7	360	0.00745	0.0207
31-0052	2	4	B45	7.7	353	0.001979	0.0056
31-0053	2	4	A90	7.8	358	0.00604	0.0169
31-0054	2	4	B90	7.9	362	0.001535	0.0042
31-0055	2	4	A135	8.0	356	0.000486	0.0014
31-0056	2	4	B135	8.0	355	0.000453	0.0013
31-0057	2	4	A180	8.1	356	0.000468	0.0013
31-0058	2	4	B180	8.2	355	0.000564	0.0016
31-0059	2	4	A225	8.2	362	0.000904	0.0025

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
31-0060	2	4	B225	8.3	351	0.000583	0.0017
31-0061	2	4	A270	8.3	361	0.01066	0.0295
31-0062	2	4	B270	8.4	361	0.001467	0.0041
31-0063	2	4	A315	8.5	358	0.024	0.0671
31-0064	2	4	B315	8.5	358	0.00862	0.0241
32-0001	3	1	A0	16.1	360	0.00372	0.010333
32-0002	3	1	B0	16.1	360	0.00248	0.006889
32-0003	3	1	A45	16.2	360	0.001754	0.004872
32-0004	3	1	B45	16.2	360	0.00235	0.006528
32-0005	3	1	A90	16.3	360	0.000927	0.002575
32-0006	3	1	B90	16.3	360	0.001003	0.002786
32-0007	3	1	A135	16.4	362	0.000589	0.001627
32-0008	3	1	B135	16.4	361	0.000521	0.001443
32-0009	3	1	A180	16.5	361	0.00072	0.001994
32-0010	3	1	B180	16.5	361	0.000761	0.002108
32-0011	3	1	A225	16.6	362	0.00087	0.002403
32-0012	3	1	B225	16.7	361	0.000718	0.001989
32-0013	3	1	A270	16.7	363	0.00377	0.010386
32-0014	3	1	B270	16.8	363	0.001801	0.004961
32-0015	3	1	A315	16.9	363	0.00568	0.015647
32-0016	3	1	B315	16.9	363	0.0043	0.011846
32-0017	3	2	A0	15.0	352	0.01059	0.030094
32-0018	3	2	B0	15.0	365	0.00641	0.017542
32-0019	3	2	A45	15.1	366	0.00886	0.024228
32-0020	3	2	B45	15.2	371	0.00412	0.011096

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
32-0021	3	2	A90	15.2	378	0.00307	0.008118
32-0022	3	2	B90	15.3	365	0.001714	0.004701
32-0023	3	2	A135	15.3	365	0.000712	0.001951
32-0024	3	2	B135	15.3	353	0.000647	0.001834
32-0025	3	2	A180	15.4	359	0.001003	0.002792
32-0026	3	2	B180	15.5	357	0.000747	0.002092
32-0027	3	2	A225	15.5	359	0.000777	0.002162
32-0028	3	2	B225	15.6	349	0.000722	0.002071
32-0029	3	2	A270	15.6	352	0.00539	0.015333
32-0030	3	2	B270	15.6	362	0.00247	0.006818
32-0031	3	2	A315	15.7	348	0.00901	0.025916
32-0032	3	2	B315	15.8	362	0.00443	0.012236
32-0033	3	3	A0	14.2	360	0.00589	0.016369
32-0034	3	3	B0	14.2	356	0.00346	0.009733
32-0035	3	3	A45	14.3	369	0.001203	0.00326
32-0036	3	3	B45	14.3	357	0.001698	0.004758
32-0037	3	3	A90	14.4	370	0.00432	0.011675
32-0038	3	3	B90	14.4	357	0.001037	0.002905
32-0039	3	3	A135	14.5	358	0.001163	0.003251
32-0040	3	3	B135	14.5	369	0.00092	0.002497
32-0041	3	3	A180	14.6	362	0.001142	0.003155
32-0042	3	3	B180	14.6	359	0.001665	0.00464
32-0043	3	3	A225	14.7	360	0.000961	0.002666
32-0044	3	3	B225	14.7	370	0.001181	0.003193
32-0045	3	3	A270	14.8	355	0.0027	0.007607

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
32-0046	3	3	B270	14.9	360	0.001387	0.00385
32-0047	3	3	A315	15.0	366	0.00403	0.011024
32-0048	3	3	B315	15.0	361	0.00241	0.006684
32-0049	3	4	A0	13.6	371	0.0261	0.070423
32-0050	3	4	B0	13.6	358	0.01349	0.037642
32-0051	3	4	A45	13.7	366	0.001227	0.003355
32-0052	3	4	B45	13.7	364	0.001156	0.003178
32-0053	3	4	A90	13.8	364	0.001368	0.003756
32-0054	3	4	B90	13.9	354	0.001002	0.002831
32-0055	3	4	A135	14.0	367	0.000743	0.002024
32-0056	3	4	B135	14.1	372	0.00077	0.00207
32-0057	3	4	A180	14.2	367	0.000705	0.00192
32-0058	3	4	B180	14.2	368	0.000872	0.002371
32-0059	3	4	A225	14.3	362	0.000802	0.002218
32-0060	3	4	B225	14.4	361	0.001166	0.003231
32-0061	3	4	A270	14.5	367	0.00404	0.010997
32-0062	3	4	B270	14.5	366	0.000938	0.002566
32-0063	3	4	A315	14.6	365	0.01191	0.032599
32-0064	3	4	B315	14.6	369	0.00431	0.011685
33-0001	4	1	A0	22.2	370	0.00414	0.011189
33-0002	4	1	B0	22.3	370	0.00258	0.006973
33-0003	4	1	A45	22.3	371	0.00256	0.0069
33-0004	4	1	B45	22.4	372	0.001993	0.005358
33-0005	4	1	A90	22.4	371	0.001914	0.005159
33-0006	4	1	B90	22.5	371	0.001125	0.003032

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
33-0007	4	1	A135	22.6	370	0.00049	0.001324
33-0008	4	1	B135	22.6	371	0.000623	0.001679
33-0009	4	1	A180	22.7	370	0.000466	0.001259
33-0010	4	1	B180	22.7	370	0.000603	0.00163
33-0011	4	1	A225	22.8	368	0.000581	0.001579
33-0012	4	1	B225	22.8	369	0.001225	0.00332
33-0013	4	1	A270	22.9	367	0.002059	0.00561
33-0014	4	1	B270	22.9	366	0.001289	0.003522
33-0015	4	1	A315	22.9	365	0.00296	0.00811
33-0016	4	1	B315	23.0	365	0.001689	0.004627
33-0017	4	2	A0	21.2	371	0.00907	0.024416
33-0018	4	2	B0	21.2	362	0.00604	0.016683
33-0019	4	2	A45	21.3	368	0.00603	0.016382
33-0020	4	2	B45	21.3	371	0.00302	0.008137
33-0021	4	2	A90	21.3	378	0.00401	0.010595
33-0022	4	2	B90	21.4	365	0.00243	0.00665
33-0023	4	2	A135	21.5	370	0.000498	0.001346
33-0024	4	2	B135	21.5	375	0.000634	0.001691
33-0025	4	2	A180	21.6	365	0.000655	0.001795
33-0026	4	2	B180	21.6	366	0.000479	0.00131
33-0027	4	2	A225	21.7	378	0.000521	0.001377
33-0028	4	2	B225	21.7	374	0.000529	0.001415
33-0029	4	2	A270	21.8	368	0.00449	0.012208
33-0030	4	2	B270	21.8	370	0.00213	0.005751
33-0031	4	2	A315	21.9	375	0.00508	0.013547

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
33-0032	4	2	B315	21.9	382	0.00321	0.008393
33-0033	4	3	A0	20.3	362	0.00273	0.00754
33-0034	4	3	B0	20.4	366	0.00216	0.005908
33-0035	4	3	A45	20.4	364	0.001783	0.004901
33-0036	4	3	B45	20.5	368	0.001332	0.003623
33-0037	4	3	A90	20.6	370	0.00247	0.00668
33-0038	4	3	B90	20.6	379	0.00096	0.002534
33-0039	4	3	A135	20.7	375	0.001052	0.002805
33-0040	4	3	B135	20.7	371	0.001101	0.002968
33-0041	4	3	A180	20.8	369	0.000909	0.002466
33-0042	4	3	B180	20.8	376	0.001213	0.003223
33-0043	4	3	A225	20.9	378	0.001071	0.002834
33-0044	4	3	B225	20.9	373	0.001062	0.002849
33-0045	4	3	A270	21.0	376	0.000902	0.002401
33-0046	4	3	B270	21.1	376	0.001056	0.002806
33-0047	4	3	A315	21.1	372	0.001401	0.003768
33-0048	4	3	B315	21.2	384	0.001127	0.002935
33-0049	4	4	A0	19.7	373	0.0258	0.069211
33-0050	4	4	B0	19.8	365	0.01147	0.031462
33-0051	4	4	A45	19.8	363	0.01054	0.029043
33-0052	4	4	B45	19.9	364	0.00535	0.014717
33-0053	4	4	A90	20.0	363	0.00467	0.012855
33-0054	4	4	B90	20.1	375	0.001387	0.003701
33-0055	4	4	A135	20.1	367	0.000553	0.001506
33-0056	4	4	B135	20.2	371	0.000522	0.001408

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
33-0057	4	4	A180	20.3	364	0.001024	0.002814
33-0058	4	4	B180	20.3	360	0.000907	0.002517
33-0059	4	4	A225	20.4	370	0.0012	0.003245
33-0060	4	4	B225	20.5	369	0.001207	0.003272
33-0061	4	4	A270	20.5	363	0.00742	0.020441
33-0062	4	4	B270	20.6	376	0.001494	0.003976
33-0063	4	4	A315	20.7	360	0.01159	0.032179
33-0064	4	4	B315	20.7	370	0.00577	0.015602
34-0001	5	1	A0	35.6	802	0.001653	0.002061
34-0002	5	1	B0	35.6	842	0.001475	0.001752
34-0003	5	1	A45	35.7	801	0.001161	0.001449
34-0004	5	1	B45	35.7	800	0.001115	0.001394
34-0005	5	1	A90	35.8	800	0.00473	0.005912
34-0006	5	1	B90	35.8	839	0.00457	0.005447
34-0007	5	1	A135	35.9	798	0.1432	0.179449
34-0008	5	1	B135	35.9	798	0.0479	0.060025
34-0009	5	1	A180	35.9	797	0.0854	0.107152
34-0010	5	1	B180	36.0	797	0.0864	0.108407
34-0011	5	1	A225	36.0	797	0.00737	0.009247
34-0012	5	1	B225	36.1	796	0.0062	0.007789
34-0013	5	1	A270	36.1	796	0.00459	0.005766
34-0014	5	1	B270	36.2	797	0.0034	0.004266
34-0015	5	1	A315	36.2	796	0.001982	0.00249
34-0016	5	1	B315	36.2	795	0.001081	0.00136
34-0017	5	2	A0	34.6	825	0.00763	0.009247

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
34-0018	5	2	B0	34.6	806	0.00551	0.006838
34-0019	5	2	A45	34.7	814	0.01591	0.019549
34-0020	5	2	B45	34.7	810	0.0085	0.010491
34-0021	5	2	A90	34.8	830	0.0251	0.030257
34-0022	5	2	B90	34.8	797	0.0234	0.029354
34-0023	5	2	A135	34.8	814	0.1295	0.159163
34-0024	5	2	B135	34.9	818	0.0777	0.094962
34-0025	5	2	A180	34.9	792	0.0516	0.065119
34-0026	5	2	B180	34.9	817	0.0348	0.042617
34-0027	5	2	A225	35.0	817	0.00404	0.004944
34-0028	5	2	B225	35.0	816	0.00395	0.004843
34-0029	5	2	A270	35.1	794	0.00543	0.006842
34-0030	5	2	B270	35.1	799	0.00294	0.003681
34-0031	5	2	A315	35.2	804	0.00205	0.00255
34-0032	5	2	B315	35.2	796	0.00122	0.001532
34-0033	5	3	A0	33.8	809	0.001969	0.002434
34-0034	5	3	B0	33.8	804	0.00228	0.002836
34-0035	5	3	A45	33.8	806	0.001109	0.001377
34-0036	5	3	B45	33.9	800	0.001967	0.002458
34-0037	5	3	A90	33.9	816	0.00577	0.007074
34-0038	5	3	B90	33.9	806	0.00233	0.002891
34-0039	5	3	A135	34.0	799	0.01457	0.018231
34-0040	5	3	B135	34.0	805	0.0103	0.012802
34-0041	5	3	A180	34.1	801	0.0592	0.073946
34-0042	5	3	B180	34.1	792	0.01559	0.019689

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
34-0043	5	3	A225	34.1	794	0.00377	0.004747
34-0044	5	3	B225	34.2	801	0.001972	0.002463
34-0045	5	3	A270	34.2	788	0.00246	0.003121
34-0046	5	3	B270	34.2	796	0.001455	0.001829
34-0047	5	3	A315	34.3	803	0.00109	0.001358
34-0048	5	3	B315	34.3	822	0.000821	0.000999
34-0049	5	4	A0	33.1	761	0.00955	0.012543
34-0050	5	4	B0	33.2	819	0.00478	0.005833
34-0051	5	4	A45	33.3	838	0.00332	0.003964
34-0052	5	4	B45	33.3	816	0.001655	0.002028
34-0053	5	4	A90	33.3	844	0.01631	0.019331
34-0054	5	4	B90	33.4	817	0.00663	0.008119
34-0055	5	4	A135	33.5	815	0.0871	0.106897
34-0056	5	4	B135	33.5	813	0.0479	0.058948
34-0057	5	4	A180	33.6	808	0.0404	0.049988
34-0058	5	4	B180	33.6	814	0.0259	0.031835
34-0059	5	4	A225	33.7	817	0.01153	0.01411
34-0060	5	4	B225	33.7	811	0.00363	0.004474
34-0061	5	4	A270	33.8	820	0.00838	0.010219
34-0062	5	4	B270	33.8	837	0.00258	0.003083
34-0063	5	4	A315	33.9	806	0.00366	0.004539
34-0064	5	4	B315	33.9	801	0.001655	0.002066
35-0001	6	1	A0	46.2	638	0.00251	0.003934
35-0002	6	1	B0	46.3	606	0.001666	0.002749
35-0003	6	1	A45	46.3	637	0.001283	0.002014

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
35-0004	6	1	B45	46.4	638	0.00113	0.001771
35-0005	6	1	A90	46.4	639	0.00258	0.004038
35-0006	6	1	B90	46.5	640	0.00173	0.002703
35-0007	6	1	A135	46.5	608	0.0057	0.009375
35-0008	6	1	B135	46.6	640	0.001381	0.002158
35-0009	6	1	A180	46.6	642	0.001992	0.003103
35-0010	6	1	B180	46.7	641	0.001084	0.001691
35-0011	6	1	A225	46.7	641	0.000874	0.001363
35-0012	6	1	B225	46.8	642	0.000623	0.00097
35-0013	6	1	A270	46.8	642	0.00224	0.003489
35-0014	6	1	B270	46.9	641	0.001664	0.002596
35-0015	6	1	A315	46.9	642	0.00324	0.005047
35-0016	6	1	B315	47.0	643	0.001845	0.002869
35-0017	6	2	A0	45.2	652	0.00309	0.004738
35-0018	6	2	B0	45.2	626	0.00246	0.003929
35-0019	6	2	A45	45.2	635	0.000353	0.000556
35-0020	6	2	B45	45.3	639	0.00261	0.004086
35-0021	6	2	A90	45.4	652	0.00354	0.00543
35-0022	6	2	B90	45.4	623	0.00214	0.003435
35-0023	6	2	A135	45.5	645	0.00281	0.004359
35-0024	6	2	B135	45.5	648	0.00271	0.00418
35-0025	6	2	A180	45.6	628	0.00232	0.003695
35-0026	6	2	B180	45.6	652	0.00315	0.004833
35-0027	6	2	A225	45.7	673	0.001302	0.001935
35-0028	6	2	B225	45.7	651	0.00107	0.001645

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
35-0029	6	2	A270	45.7	635	0.00284	0.004473
35-0030	6	2	B270	45.8	642	0.001926	0.003
35-0031	6	2	A315	45.8	648	0.00226	0.003489
35-0032	6	2	B315	45.9	658	0.001126	0.001712
35-0033	6	3	A0	44.3	627	0.001384	0.002206
35-0034	6	3	B0	44.4	642	0.001073	0.001671
35-0035	6	3	A45	44.4	628	0.000816	0.001299
35-0036	6	3	B45	44.4	637	0.0009	0.001412
35-0037	6	3	A90	44.5	648	0.001527	0.002356
35-0038	6	3	B90	44.5	629	0.000869	0.001382
35-0039	6	3	A135	44.6	644	0.001314	0.002042
35-0040	6	3	B135	44.6	640	0.000765	0.001196
35-0041	6	3	A180	44.7	645	0.00468	0.00726
35-0042	6	3	B180	44.7	644	0.000975	0.001515
35-0043	6	3	A225	44.7	634	0.000775	0.001223
35-0044	6	3	B225	44.8	636	0.000796	0.001251
35-0045	6	3	A270	44.8	641	0.001166	0.001819
35-0046	6	3	B270	44.9	637	0.000822	0.00129
35-0047	6	3	A315	45.0	647	0.000909	0.001406
35-0048	6	3	B315	45.0	654	0.00086	0.001316
35-0049	6	4	A0	43.7	657	0.0267	0.04066
35-0050	6	4	B0	43.8	648	0.0106	0.016348
35-0051	6	4	A45	43.9	661	0.0096	0.014521
35-0052	6	4	B45	43.9	625	0.000653	0.001044
35-0053	6	4	A90	44.0	671	0.0258	0.038435

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
35-0054	6	4	B90	44.1	648	0.00999	0.01541
35-0055	6	4	A135	44.1	646	0.01713	0.026529
35-0056	6	4	B135	44.2	652	0.00836	0.012832
35-0057	6	4	A180	44.3	646	0.01963	0.030383
35-0058	6	4	B180	44.3	648	0.00504	0.007774
35-0059	6	4	A225	44.4	658	0.01667	0.025337
35-0060	6	4	B225	44.4	654	0.00793	0.012117
35-0061	6	4	A270	44.5	658	0.0478	0.072689
35-0062	6	4	B270	44.5	653	0.0183	0.028019
35-0063	6	4	A315	44.6	654	0.0248	0.037897
35-0064	6	4	B315	44.6	643	0.00794	0.012345
36-0001	7	1	A0	59.3	780	0.00234	0.003
36-0002	7	1	B0	59.3	780	0.001818	0.002331
36-0003	7	1	A45	59.3	780	0.001593	0.002042
36-0004	7	1	B45	59.3	779	0.001367	0.001755
36-0005	7	1	A90	59.4	778	0.001739	0.002235
36-0006	7	1	B90	59.4	816	0.001304	0.001598
36-0007	7	1	A135	59.5	776	0.00242	0.003119
36-0008	7	1	B135	59.5	775	0.001018	0.001314
36-0009	7	1	A180	59.5	773	0.001779	0.002301
36-0010	7	1	B180	59.6	773	0.001524	0.001972
36-0011	7	1	A225	59.6	773	0.000521	0.000674
36-0012	7	1	B225	59.6	772	0.001159	0.001501
36-0013	7	1	A270	59.7	774	0.001597	0.002063
36-0014	7	1	B270	59.8	774	0.001105	0.001428

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
36-0015	7	1	A315	59.8	774	0.001807	0.002335
36-0016	7	1	B315	59.8	773	0.00202	0.002613
36-0017	7	2	A0	58.2	798	0.00423	0.005301
36-0018	7	2	B0	58.2	788	0.0036	0.004567
36-0019	7	2	A45	58.3	787	0.012	0.015243
36-0020	7	2	B45	58.3	785	0.00528	0.006729
36-0021	7	2	A90	58.3	798	0.00511	0.0064
36-0022	7	2	B90	58.4	790	0.00239	0.003027
36-0023	7	2	A135	58.4	791	0.00208	0.00263
36-0024	7	2	B135	58.5	784	0.0023	0.002934
36-0025	7	2	A180	58.5	788	0.00235	0.002983
36-0026	7	2	B180	58.5	803	0.001551	0.001931
36-0027	7	2	A225	58.6	785	0.001283	0.001634
36-0028	7	2	B225	58.7	800	0.001211	0.001514
36-0029	7	2	A270	58.7	771	0.001709	0.002215
36-0030	7	2	B270	58.7	779	0.001332	0.001709
36-0031	7	2	A315	58.8	790	0.001726	0.002184
36-0032	7	2	B315	58.8	797	0.000942	0.001182
36-0033	7	3	A0	57.3	806	0.001362	0.00169
36-0034	7	3	B0	57.4	792	0.001124	0.001419
36-0035	7	3	A45	57.4	781	0.001398	0.00179
36-0036	7	3	B45	57.4	774	0.001517	0.00196
36-0037	7	3	A90	57.5	791	0.00331	0.004185
36-0038	7	3	B90	57.5	788	0.001761	0.002234
36-0039	7	3	A135	57.6	786	0.000896	0.00114

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
36-0040	7	3	B135	57.6	783	0.000939	0.0012
36-0041	7	3	A180	57.7	797	0.001044	0.00131
36-0042	7	3	B180	57.7	782	0.001185	0.001515
36-0043	7	3	A225	57.7	781	0.001188	0.001522
36-0044	7	3	B225	57.8	792	0.000937	0.001183
36-0045	7	3	A270	57.8	792	0.001035	0.001306
36-0046	7	3	B270	57.9	765	0.000992	0.001297
36-0047	7	3	A315	57.9	805	0.000899	0.001116
36-0048	7	3	B315	58.0	788	0.000937	0.00119
36-0049	7	4	A0	56.8	834	0.00375	0.004497
36-0050	7	4	B0	56.8	788	0.001392	0.001767
36-0051	7	4	A45	56.8	803	0.00234	0.002913
36-0052	7	4	B45	56.9	801	0.001345	0.001679
36-0053	7	4	A90	56.9	814	0.00503	0.006181
36-0054	7	4	B90	57.0	793	0.001065	0.001343
36-0055	7	4	A135	57.0	787	0.001553	0.001974
36-0056	7	4	B135	57.0	781	0.00212	0.002714
36-0057	7	4	A180	57.1	785	0.00827	0.010539
36-0058	7	4	B180	57.2	786	0.00257	0.003269
36-0059	7	4	A225	57.2	797	0.00764	0.009588
36-0060	7	4	B225	57.3	785	0.00335	0.004266
36-0061	7	4	A270	57.3	802	0.00589	0.007347
36-0062	7	4	B270	57.4	804	0.00263	0.003269
36-0063	7	4	A315	57.4	794	0.001738	0.002189
36-0064	7	4	B315	57.5	779	0.001411	0.001811

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
37-0001	8	1	A0	70.3	665	0.001823	0.002741
37-0002	8	1	B0	70.4	635	0.001093	0.001722
37-0003	8	1	A45	70.4	668	0.000975	0.00146
37-0004	8	1	B45	70.5	668	0.000912	0.001365
37-0005	8	1	A90	70.5	668	0.001328	0.001988
37-0006	8	1	B90	70.6	601	0.001232	0.002049
37-0007	8	1	A135	70.6	669	0.001686	0.00252
37-0008	8	1	B135	70.6	635	0.001226	0.001932
37-0009	8	1	A180	70.7	636	0.00262	0.004122
37-0010	8	1	B180	70.7	669	0.001937	0.002895
37-0011	8	1	A225	70.7	668	0.00222	0.003323
37-0012	8	1	B225	70.8	668	0.001373	0.002055
37-0013	8	1	A270	70.8	666	0.00216	0.003243
37-0014	8	1	B270	70.8	665	0.001721	0.002588
37-0015	8	1	A315	70.9	664	0.001694	0.002551
37-0016	8	1	B315	70.9	664	0.001296	0.001952
37-0017	8	2	A0	69.3	677	0.00217	0.003207
37-0018	8	2	B0	69.3	670	0.001825	0.002724
37-0019	8	2	A45	69.3	670	0.00503	0.007504
37-0020	8	2	B45	69.3	660	0.00252	0.00382
37-0021	8	2	A90	69.4	680	0.00223	0.003278
37-0022	8	2	B90	69.4	666	0.001074	0.001612
37-0023	8	2	A135	69.4	667	0.001971	0.002954
37-0024	8	2	B135	69.5	663	0.00315	0.004754
37-0025	8	2	A180	69.5	663	0.00247	0.003728

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
37-0026	8	2	B180	69.6	673	0.001686	0.002504
37-0027	8	2	A225	69.6	660	0.001457	0.002207
37-0028	8	2	B225	69.6	663	0.001241	0.001873
37-0029	8	2	A270	69.7	646	0.00212	0.003279
37-0030	8	2	B270	69.7	653	0.001391	0.002131
37-0031	8	2	A315	69.7	663	0.001417	0.002139
37-0032	8	2	B315	69.8	672	0.000895	0.001332
37-0033	8	3	A0	68.4	663	0.001106	0.001667
37-0034	8	3	B0	68.4	682	0.000776	0.001137
37-0035	8	3	A45	68.5	667	0.00101	0.001514
37-0036	8	3	B45	68.5	660	0.001531	0.002318
37-0037	8	3	A90	68.5	671	0.001447	0.002158
37-0038	8	3	B90	68.6	673	0.000834	0.001239
37-0039	8	3	A135	68.6	667	0.000871	0.001305
37-0040	8	3	B135	68.6	661	0.001063	0.001608
37-0041	8	3	A180	68.7	663	0.001535	0.002314
37-0042	8	3	B180	68.7	659	0.00133	0.002017
37-0043	8	3	A225	68.7	659	0.001074	0.00163
37-0044	8	3	B225	68.8	682	0.000898	0.001316
37-0045	8	3	A270	68.8	666	0.001206	0.001812
37-0046	8	3	B270	68.9	650	0.001074	0.001652
37-0047	8	3	A315	68.9	659	0.000893	0.001356
37-0048	8	3	B315	68.9	680	0.000843	0.00124
37-0049	8	4	A0	67.8	685	0.001611	0.002353
37-0050	8	4	B0	67.8	675	0.001024	0.001518

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (µg/m^3)
37-0051	8	4	A45	67.9	686	0.000996	0.001451
37-0052	8	4	B45	67.9	672	0.00072	0.001072
37-0053	8	4	A90	68.0	693	0.00318	0.004592
37-0054	8	4	B90	68.0	680	0.001107	0.001628
37-0055	8	4	A135	68.1	674	0.00402	0.005968
37-0056	8	4	B135	68.1	674	0.00258	0.00383
37-0057	8	4	A180	68.1	673	0.00842	0.012507
37-0058	8	4	B180	68.2	673	0.00363	0.005395
37-0059	8	4	A225	68.2	682	0.00366	0.005365
37-0060	8	4	B225	68.3	671	0.00176	0.002623
37-0061	8	4	A270	68.3	677	0.0039	0.00576
37-0062	8	4	B270	68.3	683	0.001692	0.002476
37-0063	8	4	A315	68.4	675	0.001783	0.002643
37-0064	8	4	B315	68.4	657	0.001314	0.001999

11.3. Air concentration summary – Ty Ty, GA site

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc (µg/m^3)
39-0001	1	1	A0	3.8	246	0.01245	0.050533
39-0002	1	1	B0	3.8	255	0.001748	0.006858
39-0003	1	1	A45	3.8	260	0.1105	0.424213
39-0004	1	1	B45	3.9	264	0.045	0.170414
39-0005	1	1	A90	3.9	261	0.1188	0.455256

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
39-0006	1	1	B90	4.0	281	0.0674	0.240059
39-0007	1	1	A135	4.0	293	0.0874	0.298396
39-0008	1	1	B135	4.1	280	0.0539	0.1926
39-0009	1	1	A180	4.1	279	0.0235	0.084374
39-0010	1	1	B180	4.2	280	0.00512	0.018268
39-0011	1	1	A225	4.2	286	0.00163	0.005694
39-0012	1	1	B225	4.3	295	0.001035	0.003505
39-0013	1	1	A270	4.3	291	0.001918	0.006601
39-0014	1	1	B270	4.4	300	0.001005	0.003346
39-0015	1	1	A315	4.4	312	0.001137	0.00364
39-0016	1	1	B315	4.5	290	0.000537	0.001851
39-0017	1	2	A0	2.4	175	0.00489	0.027886
39-0018	1	2	B0	2.4	166	0.00471	0.028333
39-0019	1	2	A45	2.5	177	0.00442	0.025001
39-0020	1	2	B45	2.5	186	0.00581	0.031225
39-0021	1	2	A90	2.6	192	0.00441	0.022924
39-0022	1	2	B90	2.7	193	0.00334	0.017282
39-0023	1	2	A135	2.8	197	0.0216	0.109917
39-0024	1	2	B135	2.8	202	0.01298	0.064251
39-0025	1	2	A180	2.9	216	0.1692	0.784727
39-0026	1	2	B180	2.9	211	0.103	0.48764
39-0027	1	2	A225	3.0	215	0.0682	0.317254
39-0028	1	2	B225	3.0	216	0.0813	0.375841
39-0029	1	2	A270	3.1	224	0.0217	0.096842
39-0030	1	2	B270	3.1	228	0.00689	0.03026
39-0031	1	2	A315	3.2	226	0.01698	0.075057
39-0032	1	2	B315	3.2	228	0.00764	0.033482
39-0033	1	3	A0	3.5	250	0.042	0.168
39-0034	1	3	B0	3.6	260	0.0073	0.028039
39-0035	1	3	A45	3.7	258	0.01095	0.042442

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
39-0036	1	3	B45	3.7	269	0.01159	0.043158
39-0037	1	3	A90	3.8	281	0.1553	0.551883
39-0038	1	3	B90	3.9	287	0.1183	0.412698
39-0039	1	3	A135	4.0	292	0.1308	0.448099
39-0040	1	3	B135	4.1	296	0.0991	0.334684
39-0041	1	3	A180	4.1	300	0.0881	0.293373
39-0042	1	3	B180	4.2	297	0.0349	0.11741
39-0043	1	3	A225	4.3	302	0.00395	0.013063
39-0044	1	3	B225	4.4	307	0.0049	0.015935
39-0045	1	3	A270	4.4	304	0.0316	0.103947
39-0046	1	3	B270	4.5	321	0.0269	0.083722
39-0047	1	3	A315	4.5	318	0.01731	0.054477
39-0048	1	3	B315	4.6	335	0.0335	0.099881
39-0049	1	4	A0	2.5	173	0.00515	0.029811
39-0050	1	4	B0	2.5	173	0.00243	0.014066
39-0051	1	4	A45	2.6	183	0.00391	0.02134
39-0052	1	4	B45	2.7	186	0.001	0.005376
39-0053	1	4	A90	2.7	196	0.00782	0.039915
39-0054	1	4	B90	2.8	199	0.00216	0.010839
39-0055	1	4	A135	2.9	208	0.01341	0.064397
39-0056	1	4	B135	3.0	207	0.00328	0.015875
39-0057	1	4	A180	3.1	212	0.0489	0.230813
39-0058	1	4	B180	3.1	214	0.01849	0.086376
39-0059	1	4	A225	3.2	206	0.00888	0.043123
39-0060	1	4	B225	3.2	226	0.00407	0.017993
39-0061	1	4	A270	3.3	231	0.00822	0.035539
39-0062	1	4	B270	3.4	235	0.00282	0.011978
39-0063	1	4	A315	3.4	224	0.0066	0.029431
39-0064	1	4	B315	3.4	232	0.00326	0.014069
40-0001	2	1	A0	9.8	379	0.01224	0.032273

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
40-0002	2	1	B0	9.8	328	0.00506	0.01542
40-0003	2	1	A45	9.8	384	0.0077	0.020074
40-0004	2	1	B45	9.9	380	0.0034	0.008947
40-0005	2	1	A90	9.9	366	0.00544	0.014863
40-0006	2	1	B90	10.0	365	0.0041	0.01123
40-0007	2	1	A135	10.0	374	0.00249	0.006666
40-0008	2	1	B135	10.0	346	0.001811	0.005231
40-0009	2	1	A180	10.1	360	0.00323	0.008964
40-0010	2	1	B180	10.1	369	0.001786	0.004839
40-0011	2	1	A225	10.2	374	0.00244	0.006523
40-0012	2	1	B225	10.2	369	0.001459	0.003959
40-0013	2	1	A270	10.3	382	0.00971	0.025444
40-0014	2	1	B270	10.3	375	0.00572	0.015253
40-0015	2	1	A315	10.4	382	0.0092	0.024096
40-0016	2	1	B315	10.4	364	0.00451	0.012379
40-0017	2	2	A0	8.4	367	0.001895	0.005168
40-0018	2	2	B0	8.4	370	0.0014	0.003779
40-0019	2	2	A45	8.5	358	0.001107	0.003089
40-0020	2	2	B45	8.5	366	0.001583	0.004327
40-0021	2	2	A90	8.6	359	0.001258	0.003506
40-0022	2	2	B90	8.6	353	0.001613	0.004566
40-0023	2	2	A135	8.7	358	0.001296	0.003623
40-0024	2	2	B135	8.8	345	0.000952	0.002763
40-0025	2	2	A180	8.8	356	0.00364	0.010235
40-0026	2	2	B180	8.9	349	0.00357	0.010222
40-0027	2	2	A225	8.9	358	0.001171	0.00327
40-0028	2	2	B225	9.0	332	0.000929	0.002798
40-0029	2	2	A270	9.1	367	0.002046	0.00558
40-0030	2	2	B270	9.1	375	0.00205	0.005466
40-0031	2	2	A315	9.2	368	0.001366	0.00371

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
40-0032	2	2	B315	9.3	374	0.001587	0.004245
40-0033	2	3	A0	9.5	369	0.0186	0.050407
40-0034	2	3	B0	9.6	368	0.00891	0.024214
40-0035	2	3	A45	9.7	361	0.01034	0.028643
40-0036	2	3	B45	9.7	360	0.00491	0.013639
40-0037	2	3	A90	9.8	357	0.00774	0.021681
40-0038	2	3	B90	9.8	355	0.00353	0.009944
40-0039	2	3	A135	9.9	354	0.0026	0.007345
40-0040	2	3	B135	10.0	354	0.001443	0.004076
40-0041	2	3	A180	10.0	345	0.00485	0.014052
40-0042	2	3	B180	10.1	353	0.00207	0.005864
40-0043	2	3	A225	10.1	350	0.00435	0.012429
40-0044	2	3	B225	10.2	348	0.001779	0.005112
40-0045	2	3	A270	10.2	347	0.01822	0.052507
40-0046	2	3	B270	10.3	348	0.01033	0.029684
40-0047	2	3	A315	10.3	348	0.0271	0.077874
40-0048	2	3	B315	10.4	349	0.01095	0.031375
40-0049	2	4	A0	8.5	365	0.1021	0.27942
40-0050	2	4	B0	8.6	375	0.0393	0.104791
40-0051	2	4	A45	8.6	369	0.0692	0.187596
40-0052	2	4	B45	8.7	370	0.0219	0.059166
40-0053	2	4	A90	8.8	358	0.062	0.173043
40-0054	2	4	B90	8.8	359	0.0165	0.046005
40-0055	2	4	A135	8.9	358	0.0212	0.059206
40-0056	2	4	B135	9.0	348	0.00479	0.013776
40-0057	2	4	A180	9.0	373	0.0699	0.187636
40-0058	2	4	B180	9.1	367	0.02008	0.054668
40-0059	2	4	A225	9.1	373	0.0267	0.071506
40-0060	2	4	B225	9.2	378	0.01363	0.036054
40-0061	2	4	A270	9.3	367	0.0433	0.118

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
40-0062	2	4	B270	9.3	367	0.01325	0.036056
40-0063	2	4	A315	9.4	380	0.0289	0.076013
40-0064	2	4	B315	9.4	370	0.01525	0.041162
41-0001	3	1	A0	15.7	356	0.00835	0.023451
41-0002	3	1	B0	15.7	333	0.00453	0.013611
41-0003	3	1	A45	15.8	349	0.00835	0.023904
41-0004	3	1	B45	15.8	357	0.00624	0.017473
41-0005	3	1	A90	15.8	370	0.01784	0.048156
41-0006	3	1	B90	15.9	350	0.01202	0.034305
41-0007	3	1	A135	15.9	350	0.00484	0.013824
41-0008	3	1	B135	16.0	362	0.0034	0.0094
41-0009	3	1	A180	16.0	372	0.00319	0.008578
41-0010	3	1	B180	16.1	358	0.001589	0.004432
41-0011	3	1	A225	16.1	354	0.000659	0.001861
41-0012	3	1	B225	16.2	360	0.000517	0.001437
41-0013	3	1	A270	16.2	358	0.00348	0.009733
41-0014	3	1	B270	16.3	359	0.00233	0.006486
41-0015	3	1	A315	16.5	192	0.00304	0.015804
41-0016	3	1	B315	16.4	368	0.001837	0.004989
41-0017	3	2	A0	14.3	349	0.001902	0.005456
41-0018	3	2	B0	14.3	353	0.001441	0.004084
41-0019	3	2	A45	14.4	341	0.000785	0.002301
41-0020	3	2	B45	14.4	357	0.000914	0.002559
41-0021	3	2	A90	14.5	352	0.00218	0.006193
41-0022	3	2	B90	14.5	347	0.001839	0.005298
41-0023	3	2	A135	14.6	358	0.001084	0.003028
41-0024	3	2	B135	14.6	360	0.000964	0.002677
41-0025	3	2	A180	14.7	353	0.001977	0.0056
41-0026	3	2	B180	14.7	353	0.001517	0.004302
41-0027	3	2	A225	14.8	352	0.00116	0.003292

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
41-0028	3	2	B225	14.8	353	0.000989	0.002803
41-0029	3	2	A270	14.9	334	0.000683	0.002042
41-0030	3	2	B270	14.9	343	0.001678	0.004891
41-0031	3	2	A315	15.0	354	0.001501	0.004243
41-0032	3	2	B315	15.0	338	0.000978	0.002893
41-0033	3	3	A0	15.4	346	0.00993	0.028689
41-0034	3	3	B0	15.5	346	0.0069	0.019935
41-0035	3	3	A45	15.6	353	0.00203	0.005751
41-0036	3	3	B45	15.6	344	0.001483	0.004309
41-0037	3	3	A90	15.7	345	0.001552	0.004497
41-0038	3	3	B90	15.7	345	0.001163	0.00337
41-0039	3	3	A135	15.8	353	0.000928	0.002629
41-0040	3	3	B135	15.8	352	0.000793	0.002253
41-0041	3	3	A180	15.9	343	0.00257	0.007488
41-0042	3	3	B180	15.9	351	0.001457	0.004151
41-0043	3	3	A225	16.0	354	0.001507	0.004257
41-0044	3	3	B225	16.1	355	0.000709	0.001997
41-0045	3	3	A270	16.2	446	0.00692	0.015507
41-0046	3	3	B270	16.2	357	0.00383	0.010728
41-0047	3	3	A315	16.3	356	0.01108	0.031124
41-0048	3	3	B315	16.3	348	0.00702	0.020168
41-0049	3	4	A0	14.4	356	0.0892	0.250516
41-0050	3	4	B0	14.5	354	0.0484	0.136723
41-0051	3	4	A45	14.5	346	0.0613	0.177379
41-0052	3	4	B45	14.6	348	0.0271	0.077878
41-0053	3	4	A90	14.7	353	0.0641	0.18138
41-0054	3	4	B90	14.7	357	0.01137	0.031869
41-0055	3	4	A135	14.8	342	0.00963	0.028143
41-0056	3	4	B135	14.9	361	0.00343	0.0095
41-0057	3	4	A180	15.0	355	0.0266	0.074938

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
41-0058	3	4	B180	15.1	356	0.01076	0.030221
41-0059	3	4	A225	15.2	351	0.0131	0.037281
41-0060	3	4	B225	15.2	352	0.00532	0.015132
41-0061	3	4	A270	15.3	356	0.0223	0.06263
41-0062	3	4	B270	15.4	362	0.00902	0.024887
41-0063	3	4	A315	15.5	359	0.0309	0.086019
41-0064	3	4	B315	15.6	375	0.01317	0.035095
42-0001	4	1	A0	21.8	363	0.00542	0.014924
42-0002	4	1	B0	21.8	353	0.0033	0.009359
42-0003	4	1	A45	21.8	359	0.00469	0.013049
42-0004	4	1	B45	21.9	358	0.00343	0.009568
42-0005	4	1	A90	21.9	374	0.00884	0.02365
42-0006	4	1	B90	22.0	358	0.00604	0.016871
42-0007	4	1	A135	22.1	359	0.00351	0.009769
42-0008	4	1	B135	22.1	376	0.00305	0.008116
42-0009	4	1	A180	22.1	375	0.00445	0.011853
42-0010	4	1	B180	22.2	351	0.00251	0.007154
42-0011	4	1	A225	22.3	367	0.001106	0.00301
42-0012	4	1	B225	22.3	361	0.000832	0.002305
42-0013	4	1	A270	22.4	365	0.001476	0.004045
42-0014	4	1	B270	22.4	368	0.000907	0.002467
42-0015	4	1	A315	22.5	370	0.000775	0.002095
42-0016	4	1	B315	22.5	370	0.000596	0.00161
42-0017	4	2	A0	20.4	362	0.001301	0.003593
42-0018	4	2	B0	20.4	358	0.000913	0.002552
42-0019	4	2	A45	20.5	369	0.000678	0.001836
42-0020	4	2	B45	20.5	362	0.001134	0.003134
42-0021	4	2	A90	20.5	377	0.001569	0.004162
42-0022	4	2	B90	20.6	372	0.00112	0.003009
42-0023	4	2	A135	20.7	366	0.00121	0.00331

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
42-0024	4	2	B135	20.7	376	0.001372	0.003652
42-0025	4	2	A180	20.8	369	0.00226	0.006123
42-0026	4	2	B180	20.8	370	0.00119	0.003216
42-0027	4	2	A225	20.9	369	0.000904	0.002449
42-0028	4	2	B225	21.0	372	0.000904	0.002433
42-0029	4	2	A270	21.0	369	0.001304	0.003531
42-0030	4	2	B270	21.0	374	0.001302	0.003485
42-0031	4	2	A315	21.1	368	0.000934	0.002538
42-0032	4	2	B315	21.2	379	0.000767	0.002025
42-0033	4	3	A0	21.4	360	0.00309	0.008583
42-0034	4	3	B0	21.5	360	0.00256	0.007111
42-0035	4	3	A45	21.6	369	0.001184	0.003209
42-0036	4	3	B45	21.6	360	0.000923	0.002564
42-0037	4	3	A90	21.7	359	0.00201	0.005599
42-0038	4	3	B90	21.7	359	0.001109	0.003089
42-0039	4	3	A135	21.8	360	0.00138	0.003833
42-0040	4	3	B135	21.8	360	0.001232	0.003422
42-0041	4	3	A180	21.9	359	0.00245	0.006825
42-0042	4	3	B180	21.9	360	0.001605	0.004458
42-0043	4	3	A225	22.0	359	0.001752	0.00488
42-0044	4	3	B225	22.0	358	0.00122	0.003408
42-0045	4	3	A270	22.1	358	0.00347	0.009693
42-0046	4	3	B270	22.2	358	0.00304	0.008492
42-0047	4	3	A315	22.2	359	0.00232	0.006462
42-0048	4	3	B315	22.3	358	0.001733	0.004841
42-0049	4	4	A0	20.4	362	0.0571	0.157901
42-0050	4	4	B0	20.5	363	0.0265	0.072955
42-0051	4	4	A45	20.6	369	0.0313	0.084935
42-0052	4	4	B45	20.7	369	0.01233	0.033373
42-0053	4	4	A90	20.8	370	0.0518	0.140027

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
42-0054	4	4	B90	20.9	362	0.01519	0.041964
42-0055	4	4	A135	21.0	365	0.039	0.106747
42-0056	4	4	B135	21.0	372	0.01215	0.03269
42-0057	4	4	A180	21.1	367	0.0614	0.167382
42-0058	4	4	B180	21.2	369	0.01718	0.046602
42-0059	4	4	A225	21.2	368	0.0309	0.083866
42-0060	4	4	B225	21.3	366	0.01578	0.043136
42-0061	4	4	A270	21.4	365	0.0518	0.14199
42-0062	4	4	B270	21.5	365	0.0209	0.057289
42-0063	4	4	A315	21.5	365	0.0315	0.086292
42-0064	4	4	B315	21.6	358	0.01192	0.033279
43-0001	5	1	A0	35.7	854	0.00449	0.005256
43-0002	5	1	B0	35.8	886	0.00246	0.002777
43-0003	5	1	A45	35.8	828	0.00365	0.00441
43-0004	5	1	B45	35.9	833	0.001675	0.00201
43-0005	5	1	A90	35.9	858	0.0039	0.004546
43-0006	5	1	B90	36.0	856	0.00466	0.005444
43-0007	5	1	A135	36.0	824	0.00322	0.003907
43-0008	5	1	B135	36.1	855	0.00246	0.002878
43-0009	5	1	A180	36.1	417	0.0053	0.0127
43-0010	5	1	B180	36.1	821	0.00341	0.004153
43-0011	5	1	A225	36.2	836	0.00441	0.005275
43-0012	5	1	B225	36.2	831	0.00278	0.003344
43-0013	5	1	A270	36.3	835	0.00877	0.010505
43-0014	5	1	B270	36.3	841	0.0053	0.006304
43-0015	5	1	A315	36.4	843	0.00424	0.005029
43-0016	5	1	B315	36.4	834	0.002009	0.002408
43-0017	5	2	A0	34.3	856	0.00408	0.004765
43-0018	5	2	B0	34.3	848	0.001882	0.002221
43-0019	5	2	A45	34.4	838	0.000985	0.001176

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
43-0020	5	2	B45	34.4	865	0.001264	0.001462
43-0021	5	2	A90	34.5	865	0.00184	0.002128
43-0022	5	2	B90	34.5	873	0.0022	0.002521
43-0023	5	2	A135	34.6	838	0.001291	0.001541
43-0024	5	2	B135	34.6	864	0.001784	0.002065
43-0025	5	2	A180	34.7	840	0.00889	0.010578
43-0026	5	2	B180	34.8	829	0.00335	0.004042
43-0027	5	2	A225	34.8	837	0.00268	0.003201
43-0028	5	2	B225	34.9	828	0.002129	0.002571
43-0029	5	2	A270	34.9	840	0.00724	0.008615
43-0030	5	2	B270	35.0	902	0.00882	0.009776
43-0031	5	2	A315	35.0	838	0.0205	0.024458
43-0032	5	2	B315	35.1	852	0.00313	0.003676
43-0033	5	3	A0	35.4	840	0.00242	0.002881
43-0034	5	3	B0	35.5	839	0.001468	0.00175
43-0035	5	3	A45	35.5	796	0.001243	0.001561
43-0036	5	3	B45	35.6	837	0.000925	0.001105
43-0037	5	3	A90	35.6	1046	0.00221	0.002112
43-0038	5	3	B90	35.6	1045	0.001362	0.001303
43-0039	5	3	A135	35.7	835	0.001648	0.001974
43-0040	5	3	B135	35.7	1043	0.001417	0.001359
43-0041	5	3	A180	35.8	834	0.0029	0.003477
43-0042	5	3	B180	35.8	834	0.001643	0.00197
43-0043	5	3	A225	35.9	833	0.00236	0.002833
43-0044	5	3	B225	35.9	832	0.001743	0.002095
43-0045	5	3	A270	36.0	1039	0.00524	0.005045
43-0046	5	3	B270	36.0	831	0.00279	0.003357
43-0047	5	3	A315	36.1	830	0.00292	0.003518
43-0048	5	3	B315	36.1	1037	0.001677	0.001616
43-0049	5	4	A0	34.4	840	0.0526	0.062619

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
43-0050	5	4	B0	34.5	841	0.023	0.027362
43-0051	5	4	A45	34.6	855	0.0256	0.029931
43-0052	5	4	B45	34.6	849	0.01315	0.015483
43-0053	5	4	A90	34.7	873	0.0549	0.062902
43-0054	5	4	B90	34.8	853	0.01431	0.016785
43-0055	5	4	A135	34.8	916	0.0423	0.046164
43-0056	5	4	B135	34.9	855	0.00938	0.010975
43-0057	5	4	A180	35.0	837	0.1279	0.152809
43-0058	5	4	B180	35.0	836	0.0452	0.054095
43-0059	5	4	A225	35.1	841	0.0586	0.069712
43-0060	5	4	B225	35.1	843	0.0301	0.035719
43-0061	5	4	A270	35.2	854	0.0861	0.100785
43-0062	5	4	B270	35.3	839	0.0278	0.033144
43-0063	5	4	A315	35.3	855	0.0364	0.042557
43-0064	5	4	B315	35.4	833	0.01525	0.018309
44-0001	6	1	A0	46.7	675	0.00353	0.005228
44-0002	6	1	B0	46.8	676	0.00211	0.003122
44-0003	6	1	A45	46.8	641	0.00227	0.00354
44-0004	6	1	B45	46.9	653	0.001312	0.002009
44-0005	6	1	A90	46.9	670	0.00292	0.004359
44-0006	6	1	B90	47.0	676	0.00219	0.003239
44-0007	6	1	A135	47.1	677	0.001935	0.00286
44-0008	6	1	B135	47.1	679	0.001477	0.002177
44-0009	6	1	A180	47.2	667	0.00211	0.003162
44-0010	6	1	B180	47.2	670	0.001301	0.001943
44-0011	6	1	A225	47.3	647	0.000608	0.00094
44-0012	6	1	B225	47.3	655	0.000474	0.000724
44-0013	6	1	A270	47.3	666	0.0032	0.004803
44-0014	6	1	B270	47.4	678	0.00208	0.00307
44-0015	6	1	A315	47.4	672	0.00372	0.005539

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
44-0016	6	1	B315	47.4	663	0.001926	0.002907
44-0017	6	2	A0	45.4	679	0.00288	0.00424
44-0018	6	2	B0	45.4	656	0.001465	0.002234
44-0019	6	2	A45	45.5	661	0.000535	0.00081
44-0020	6	2	B45	45.5	659	0.000582	0.000883
44-0021	6	2	A90	45.6	683	0.000764	0.001119
44-0022	6	2	B90	45.6	691	0.000853	0.001235
44-0023	6	2	A135	45.7	661	0.000968	0.001464
44-0024	6	2	B135	45.7	690	0.001154	0.001674
44-0025	6	2	A180	45.8	664	0.0032	0.004817
44-0026	6	2	B180	45.8	679	0.001823	0.002684
44-0027	6	2	A225	45.9	681	0.001291	0.001897
44-0028	6	2	B225	45.9	750	0.001265	0.001688
44-0029	6	2	A270	46.0	662	0.0264	0.039859
44-0030	6	2	B270	46.1	659	0.001773	0.002692
44-0031	6	2	A315	46.1	652	0.00392	0.006012
44-0032	6	2	B315	46.2	678	0.00229	0.003376
44-0033	6	3	A0	46.5	660	0.001368	0.002073
44-0034	6	3	B0	46.5	660	0.001046	0.001585
44-0035	6	3	A45	46.5	825	0.000873	0.001058
44-0036	6	3	B45	46.6	660	0.000649	0.000983
44-0037	6	3	A90	46.6	660	0.00083	0.001258
44-0038	6	3	B90	46.6	660	0.00081	0.001227
44-0039	6	3	A135	46.7	660	0.000883	0.001338
44-0040	6	3	B135	46.7	661	0.000762	0.001153
44-0041	6	3	A180	46.8	661	0.001127	0.001705
44-0042	6	3	B180	46.8	660	0.000982	0.001488
44-0043	6	3	A225	46.9	660	0.000795	0.001205
44-0044	6	3	B225	46.9	661	0.000615	0.00093
44-0045	6	3	A270	47.0	662	0.00242	0.003656

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
44-0046	6	3	B270	47.0	661	0.001647	0.002492
44-0047	6	3	A315	47.1	662	0.00322	0.004864
44-0048	6	3	B315	47.2	663	0.00129	0.001946
44-0049	6	4	A0	45.4	661	0.01349	0.020399
44-0050	6	4	B0	45.5	666	0.00467	0.007017
44-0051	6	4	A45	45.5	666	0.00499	0.007494
44-0052	6	4	B45	45.6	663	0.0025	0.003773
44-0053	6	4	A90	45.7	671	0.00729	0.010867
44-0054	6	4	B90	45.7	674	0.00197	0.002922
44-0055	6	4	A135	45.8	659	0.00601	0.00912
44-0056	6	4	B135	45.8	665	0.00234	0.003519
44-0057	6	4	A180	45.9	664	0.0311	0.046868
44-0058	6	4	B180	46.0	668	0.0137	0.020503
44-0059	6	4	A225	46.0	643	0.01893	0.029446
44-0060	6	4	B225	46.1	666	0.00948	0.014236
44-0061	6	4	A270	46.1	659	0.0207	0.031412
44-0062	6	4	B270	46.2	674	0.00791	0.01174
44-0063	6	4	A315	46.3	657	0.01155	0.017589
44-0064	6	4	B315	46.3	651	0.00549	0.008437
45-0001	7	1	A0	59.7	816	0.0028	0.003432
45-0002	7	1	B0	59.8	837	0.001729	0.002067
45-0003	7	1	A45	59.8	805	0.002096	0.002605
45-0004	7	1	B45	59.9	804	0.001254	0.001559
45-0005	7	1	A90	59.9	817	0.001356	0.001659
45-0006	7	1	B90	60.0	814	0.00223	0.002738
45-0007	7	1	A135	60.0	801	0.001695	0.002115
45-0008	7	1	B135	60.1	824	0.001474	0.001789
45-0009	7	1	A180	60.1	805	0.00433	0.00538
45-0010	7	1	B180	60.1	788	0.00271	0.003439
45-0011	7	1	A225	60.2	793	0.00431	0.005438

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
45-0012	7	1	B225	60.3	780	0.00243	0.003116
45-0013	7	1	A270	60.3	796	0.00692	0.008696
45-0014	7	1	B270	60.3	812	0.00455	0.0056
45-0015	7	1	A315	60.4	805	0.00339	0.004209
45-0016	7	1	B315	60.4	801	0.001767	0.002206
45-0017	7	2	A0	58.3	798	0.00393	0.004926
45-0018	7	2	B0	58.3	797	0.001747	0.002193
45-0019	7	2	A45	58.4	784	0.00094	0.001199
45-0020	7	2	B45	58.4	793	0.000989	0.001247
45-0021	7	2	A90	58.5	796	0.001198	0.001504
45-0022	7	2	B90	58.5	807	0.001768	0.00219
45-0023	7	2	A135	58.6	783	0.001107	0.001413
45-0024	7	2	B135	58.6	798	0.001738	0.002177
45-0025	7	2	A180	58.7	806	0.00957	0.011868
45-0026	7	2	B180	58.8	796	0.00335	0.004211
45-0027	7	2	A225	58.8	798	0.00238	0.002982
45-0028	7	2	B225	58.9	785	0.00637	0.00811
45-0029	7	2	A270	58.9	795	0.00878	0.011044
45-0030	7	2	B270	59.0	807	0.00453	0.005614
45-0031	7	2	A315	59.0	761	0.00471	0.006192
45-0032	7	2	B315	59.1	787	0.00269	0.003419
45-0033	7	3	A0	59.4	780	0.001735	0.002224
45-0034	7	3	B0	59.5	780	0.00114	0.001462
45-0035	7	3	A45	59.5	741	0.001332	0.001798
45-0036	7	3	B45	59.6	800	0.001963	0.002455
45-0037	7	3	A90	59.6	780	0.0021	0.002692
45-0038	7	3	B90	59.6	780	0.00099	0.001269
45-0039	7	3	A135	59.7	780	0.000768	0.000985
45-0040	7	3	B135	59.7	779	0.001022	0.001312
45-0041	7	3	A180	59.8	779	0.002015	0.002587

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
45-0042	7	3	B180	59.8	779	0.001589	0.00204
45-0043	7	3	A225	59.9	778	0.00237	0.003046
45-0044	7	3	B225	59.9	777	0.001223	0.001574
45-0045	7	3	A270	60.0	795	0.00843	0.010598
45-0046	7	3	B270	60.0	776	0.001968	0.002536
45-0047	7	3	A315	60.0	776	0.00255	0.003286
45-0048	7	3	B315	60.1	775	0.001305	0.001684
45-0049	7	4	A0	58.4	785	0.00834	0.010623
45-0050	7	4	B0	58.5	787	0.00333	0.004229
45-0051	7	4	A45	58.5	787	0.00331	0.004204
45-0052	7	4	B45	58.6	791	0.00227	0.002869
45-0053	7	4	A90	58.6	817	0.00538	0.006589
45-0054	7	4	B90	58.7	802	0.00233	0.002904
45-0055	7	4	A135	58.8	801	0.00483	0.00603
45-0056	7	4	B135	58.8	803	0.00208	0.002591
45-0057	7	4	A180	58.9	792	0.0225	0.028414
45-0058	7	4	B180	58.9	799	0.00747	0.009349
45-0059	7	4	A225	59.0	798	0.00824	0.01033
45-0060	7	4	B225	59.1	795	0.00642	0.008078
45-0061	7	4	A270	59.2	803	0.01422	0.0177
45-0062	7	4	B270	59.2	806	0.00619	0.007677
45-0063	7	4	A315	59.3	789	0.00669	0.008482
45-0064	7	4	B315	59.3	786	0.00316	0.00402
46-0001	8	1	A0	70.9	663	0.00381	0.005747
46-0002	8	1	B0	70.9	649	0.00253	0.003899
46-0003	8	1	A45	71.0	675	0.00238	0.003528
46-0004	8	1	B45	71.0	677	0.00175	0.002584
46-0005	8	1	A90	71.1	640	0.00299	0.00467
46-0006	8	1	B90	71.1	654	0.00226	0.003454
46-0007	8	1	A135	71.1	671	0.001577	0.00235

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
46-0008	8	1	B135	71.1	652	0.001345	0.002063
46-0009	8	1	A180	71.2	678	0.00116	0.001712
46-0010	8	1	B180	71.2	661	0.00092	0.001392
46-0011	8	1	A225	71.2	576	0.000652	0.001133
46-0012	8	1	B225	71.3	666	0.000779	0.00117
46-0013	8	1	A270	71.3	669	0.001446	0.002162
46-0014	8	1	B270	71.3	669	0.000878	0.001312
46-0015	8	1	A315	71.3	677	0.00207	0.003059
46-0016	8	1	B315	71.4	667	0.001238	0.001855
46-0017	8	2	A0	69.6	672	0.0023	0.003421
46-0018	8	2	B0	69.6	692	0.001701	0.002459
46-0019	8	2	A45	69.6	676	0.001168	0.001728
46-0020	8	2	B45	69.7	685	0.000939	0.00137
46-0021	8	2	A90	69.7	691	0.001808	0.002616
46-0022	8	2	B90	69.7	666	0.00123	0.001846
46-0023	8	2	A135	69.8	674	0.000869	0.00129
46-0024	8	2	B135	69.8	690	0.001106	0.001602
46-0025	8	2	A180	69.9	672	0.00283	0.004211
46-0026	8	2	B180	69.9	680	0.001553	0.002285
46-0027	8	2	A225	69.9	690	0.00125	0.001811
46-0028	8	2	B225	70.0	669	0.00105	0.00157
46-0029	8	2	A270	70.0	674	0.001644	0.002439
46-0030	8	2	B270	70.0	625	0.00251	0.004013
46-0031	8	2	A315	70.1	657	0.00183	0.002784
46-0032	8	2	B315	70.1	671	0.00126	0.001878
46-0033	8	3	A0	70.7	675	0.00212	0.003141
46-0034	8	3	B0	70.7	674	0.00144	0.002136
46-0035	8	3	A45	70.8	691	0.000996	0.001442
46-0036	8	3	B45	70.8	673	0.000664	0.000987
46-0037	8	3	A90	70.8	672	0.000769	0.001144

Sample number	Period	Treatment	Location	Sample end (HAT)	Volume (L)	2,4-d mass (ug/tube)	2,4-D conc ($\mu g/m^3$)
46-0038	8	3	B90	70.8	671	0.000751	0.001119
46-0039	8	3	A135	70.9	670	0.000697	0.00104
46-0040	8	3	B135	70.9	671	0.000718	0.00107
46-0041	8	3	A180	70.9	669	0.000829	0.001239
46-0042	8	3	B180	71.0	669	0.000746	0.001115
46-0043	8	3	A225	71.0	670	0.001309	0.001954
46-0044	8	3	B225	71.0	669	0.00063	0.000942
46-0045	8	3	A270	71.1	669	0.001322	0.001976
46-0046	8	3	B270	71.1	669	0.000953	0.001425
46-0047	8	3	A315	71.2	668	0.001506	0.002254
46-0048	8	3	B315	71.2	667	0.00302	0.004528
46-0049	8	4	A0	69.7	681	0.0133	0.019528
46-0050	8	4	B0	69.7	679	0.00608	0.008949
46-0051	8	4	A45	69.8	683	0.00575	0.008413
46-0052	8	4	B45	69.8	671	0.00218	0.003249
46-0053	8	4	A90	69.8	668	0.00581	0.008694
46-0054	8	4	B90	69.9	691	0.001912	0.002768
46-0055	8	4	A135	69.9	668	0.00379	0.005671
46-0056	8	4	B135	69.9	666	0.001654	0.002482
46-0057	8	4	A180	70.0	675	0.00729	0.0108
46-0058	8	4	B180	70.0	678	0.00374	0.005519
46-0059	8	4	A225	70.1	675	0.0221	0.032728
46-0060	8	4	B225	70.1	653	0.00215	0.003291
46-0061	8	4	A270	70.1	669	0.00578	0.008641
46-0062	8	4	B270	70.2	654	0.00212	0.003241
46-0063	8	4	A315	70.2	661	0.00663	0.010031
46-0064	8	4	B315	70.2	654	0.00306	0.004676

12. APPENDIX E – SINGLE-PLOT FLUX ITERATION CALCULATIONS

Flux units: $g/m^2/s$

Farmland, IN														
		Iteration 0			Iteration 1			Iteration 2			Iteration 3			
Treatment	Sample period	flux	Predicted to measured ratio (mean)	RMS	flux	Predicted to measured ratio (mean)	RMS	flux	Predicted to measured ratio (mean)	RMS	flux	Predicted to measured ratio (mean)	RMS	final flux
1 – 2,4-D choline	1	1.00E-09	8.523	0.963	1.20E-10	0.058	0.976	2.10E-09	0.756	0.953	2.80E-09	1.005	0.944	2.80E-09
	2	1.00E-09	3.906	0.044	3.00E-10	1.062	0.006	2.80E-10	0.982	0.006	2.85E-10	1.014	0.006	2.85E-10
	3	1.00E-09	72.116	0.058	1.40E-11	3.155	0.003	4.40E-12	1.796	0.002	2.50E-12	1.536	0.002	2.50E-12
	4	1.00E-09	13.056	0.062	7.70E-11	1.723	0.004	4.50E-11	1.331	0.003	3.40E-11	1.294	0.002	3.40E-11
	5	1.00E-09	61.771	0.039	1.50E-11	0.435	0.026	3.50E-11	0.701	0.025	5.00E-11	0.907	0.025	5.00E-11
	6	1.00E-09	5.729	0.031	1.75E-10	1.182	0.008	1.50E-10	1.042	0.007	1.40E-10	0.988	0.007	1.40E-10
	7	1.00E-09	11.872	0.037	8.40E-11	0.506	0.029	1.70E-10	0.814	0.028	2.10E-10	0.987	0.027	2.10E-10
	8	1.00E-09	6.274	0.040	1.50E-10	1.807	0.010	8.30E-11	1.000	0.008	8.30E-11	1.000	0.008	8.30E-11
		mean ratio	22.906		mean ratio	1.241		mean ratio	1.053		mean ratio	1.091		
			Total RMS	1.273		Total RMS	1.062		Total RMS	1.032		Total RMS	1.022	
2 - 2,4-D DMA	1	1.00E-09	0.016	1.038	2.80E-08	0.446	1.033	6.30E-08	0.830	1.044	5.50E-08	0.133	1.046	5.50E-08
	2	1.00E-09	0.303	0.033	3.00E-09	5.117	0.044	5.90E-10	5.380	0.046	1.00E-11	0.364	0.048	1.00E-11
	3	1.00E-09	3.022	0.064	3.20E-10	0.473	0.023	6.80E-10	0.432	0.025	1.20E-09	0.750	0.026	1.20E-09
	4	1.00E-09	0.012	0.041	3.90E-11	1.451	0.012	2.70E-11	0.980	0.010	4.80E-11	0.008	0.015	4.80E-11

	5	1.00E-09	0.800	0.017	5.50E-10	1.666	0.029	3.30E-10	1.742	0.031	7.00E-10	0.560	0.029	7.00E-10
	6	1.00E-09	0.005	0.045	3.80E-10	0.926	0.009	4.10E-10	0.785	0.008	2.60E-10	0.002	0.007	2.60E-10
	7	1.00E-09	0.428	0.021	3.90E-10	1.521	0.017	2.60E-10	0.382	0.017	3.50E-10	0.150	0.017	3.50E-10
	8	1.00E-09	0.028	0.052	2.70E-10	4.288	0.088	6.30E-11	6.997	0.175	4.00E-11	0.001	0.151	4.00E-11
		mean ratio	0.577		mean ratio	1.986		mean ratio	2.191		mean ratio	0.246		
			Total RMS	1.311		Total RMS	1.255		Total RMS	1.356		Total RMS	1.339	
3 – 2,4-D EHE		1.00E-07	0.711	0.509	1.40E-07	0.357	1.029	3.90E-07	0.569	1.065	6.85E-07	0.869	1.226	6.85E-07
		1.00E-07	1.863	1.207	5.40E-08	0.398	0.506	1.40E-07	0.618	1.059	2.30E-07	0.898	1.827	2.30E-07
		1.00E-07	79.264	3.440	1.30E-09	1.578	0.221	8.20E-10	1.305	0.230	6.30E-10	1.727	0.229	6.30E-10
		1.00E-07	29.026	3.537	3.50E-09	2.627	0.221	1.30E-09	2.331	0.210	8.20E-10	3.897	0.211	8.20E-10
		1.00E-07	4.992	1.115	2.50E-08	1.178	0.353	2.10E-08	0.966	0.378	2.20E-08	1.375	0.367	2.20E-08
		1.00E-07	27.137	2.651	3.70E-09	1.101	0.127	3.40E-09	0.512	0.160	6.60E-09	0.309	0.169	6.60E-09
		1.00E-07	11.715	1.322	8.50E-09	2.130	0.203	4.00E-09	3.207	0.527	1.30E-09	5.099	0.918	1.30E-09
		1.00E-07	31.966	2.847	3.10E-09	4.529	0.444	6.90E-10	10.418	1.246	6.60E-11	16.863	2.189	6.60E-11
		mean ratio	23.334		mean ratio	1.737		mean ratio	2.491		mean ratio	3.880		
			Total RMS	16.627		Total RMS	3.105		Total RMS	4.876		Total RMS	7.137	

Fowler, IN														
		Iteration 0			Iteration 1			Iteration 2			Iteration 3			
Treatment	Sample period	flux	Predicted to measured ratio (mean)	RMS	flux	Predicted to measured ratio (mean)	RMS	flux	Predicted to measured ratio (mean)	RMS	flux	Predicted to measured ratio (mean)	RMS	final flux
	1	1E-09	0.096	0.952	1E-08	0.506	0.909	2E-08	0.996	0.863	2E-08	1.002	0.863	2E-08
	2	1.00E-09	0.839	0.008	1.20E-09	0.686	0.010	1.75E-09	0.882	0.009	2.00E-09	1.082	0.009	2.00E-09
	3	1.00E-09	3.099	0.017	3.20E-10	2.225	0.017	1.40E-10	2.047	0.018	6.80E-11	1.852	0.017	6.80E-11
	4	1.00E-09	0.286	0.108	3.50E-09	0.821	0.089	4.30E-09	1.008	0.081	4.30E-09	1.008	0.081	4.30E-09
	5	1.00E-09	5.098	0.009	2.00E-10	0.859	0.003	2.30E-10	0.986	0.003	2.30E-10	0.986	0.003	2.30E-10

	6	1.00E-09	912.671	0.035	1.10E-12	4.365	0.006	2.50E-13	0.545	0.006	4.60E-13	0.751	0.006	4.60E-13
	7	1.00E-09	195.029	0.018	5.10E-11	9.434	0.004	5.40E-12	1.005	0.003	5.40E-12	1.005	0.003	5.40E-12
	8	1.00E-09	284.575	0.055	3.50E-12	1.241	0.001	2.80E-12	0.998	0.001	2.80E-12	0.998	0.001	2.80E-12
		mean ratio	175.212		mean ratio	2.517		mean ratio	1.058		mean ratio	1.086		
			Total RMS	1.203		Total RMS	1.038		Total RMS	0.984		Total RMS	0.983	
2 - 2,4-D DMA	1	1.00E-09	0.034	1.476	2.90E-08	0.527	1.321	5.50E-08	1.005	1.185	5.50E-08	1.014	1.183	5.50E-08
	2	1.00E-09	0.319	0.049	3.10E-09	0.487	0.025	6.40E-09	0.904	0.024	7.10E-09	0.962	0.031	7.10E-09
	3	1.00E-09	2.346	0.021	4.30E-10	2.051	0.024	3.50E-10	2.009	0.024	1.70E-10	1.618	0.020	1.70E-10
	4	1.00E-09	0.156	0.145	6.40E-09	0.895	0.076	7.15E-09	1.001	0.066	7.15E-09	1.001	0.066	7.15E-09
	5	1.00E-09	6.610	0.011	1.50E-10	0.717	0.007	2.10E-10	1.001	0.007	2.10E-10	0.999	0.007	2.10E-10
	6	1.00E-09	563.175	0.034	1.80E-12	1.528	0.004	1.20E-12	4.119	0.004	2.90E-13	3.777	0.004	2.90E-13
	7	1.00E-09	242.185	0.022	4.10E-12	0.233	0.008	1.80E-11	1.029	0.008	1.75E-11	1.008	0.008	1.75E-11
	8	1.00E-09	--	0.054	0.00E+00	--	0.000	0.00E+00		0.000	0.00E+00		0.000	0.00E+00
		mean ratio	116.404		mean ratio	0.920		mean ratio	1.581		mean ratio	1.483		
			Total RMS	1.813		Total RMS	1.466		Total RMS	1.319		Total RMS	1.321	
3 – 2,4-D EHE	1	1.00E-09	0.043	0.184	2.30E-08	0.710	0.072	3.20E-08	0.976	0.059	3.30E-08	1.006	0.060	3.30E-08
	2	1.00E-09	0.130	0.047	7.70E-09	0.816	0.024	9.40E-09	0.982	0.033	9.60E-09	0.999	0.034	9.60E-09
	3	1.00E-09	0.756	0.005	1.30E-09	1.214	0.019	1.10E-09	1.118	0.018	9.80E-10	1.034	0.016	9.80E-10

	4	1.00E-09	0.135	0.058	7.40E-09	0.856	0.019	8.65E-09	0.990	0.031	8.70E-09	0.995	0.031	8.70E-09
	5	1.00E-09	0.180	0.083	5.50E-09	0.931	0.058	5.90E-09	0.998	0.056	5.90E-09	0.998	0.056	5.90E-09
	6	1.00E-09	0.442	0.019	2.30E-09	0.951	0.018	2.40E-09	0.985	0.020	2.40E-09	0.985	0.020	2.40E-09
	7	1.00E-09	0.341	0.015	2.90E-09	0.828	0.014	3.50E-09	1.082	0.018	3.20E-09	0.998	0.016	3.20E-09
	8	1.00E-09	9.847	0.027	1.00E-10	1.833	0.007	5.50E-11	1.554	0.008	3.50E-11	1.364	0.009	3.50E-11
		mean ratio	1.484		mean ratio	1.017		mean ratio	1.086		mean ratio	1.047		
			Total RMS	0.440		Total RMS	0.232		Total RMS	0.243		Total RMS	0.242	

Little Rock, AR														
		Iteration 0			Iteration 1			Iteration 2			Iteration 3			
Treatment	Sample period	flux	Predicted to measured ratio (mean)	RMS	flux	Predicted to measured ratio (mean)	RMS	flux	Predicted to measured ratio (mean)	RMS	flux	Predicted to measured ratio (mean)	RMS	final flux
1 – 2,4-D choline alone	1	6.00E-10	1.170	1.765	5.10E-10	0.060	1.766	8.50E-09	0.532	1.640	4.50E-09	0.311	1.702	4.50E-09
	2	5.00E-09	1.386	0.038	3.60E-09	1.291	0.038	2.80E-09	1.008	0.035	2.80E-09	1.007	0.035	2.80E-09
	3	1.00E-09	6.433	0.069	1.60E-10	0.432	0.018	3.70E-10	0.922	0.012	3.40E-10	0.865	0.012	3.40E-10
	4	1.00E-09	3.418	0.039	2.90E-10	1.747	0.025	1.70E-10	1.582	0.021	2.70E-10	2.096	0.030	2.70E-10
	5	1.00E-09	2.138	0.228	4.70E-10	0.363	0.240	1.30E-09	1.003	0.233	1.30E-09	1.003	0.233	1.30E-09
	6	1.00E-09	3.317	0.031	3.00E-10	1.457	0.012	2.10E-10	3.116	0.037	6.50E-10	3.766	0.040	6.50E-10
	7	1.00E-	4.894	0.031	2.00E-	0.973	0.005	2.10E-	0.774	0.005	1.60E-	1.742	0.007	1.60E-

		09			10			10			10			10
	8	1.00E-09	3.812	0.035	2.60E-10	1.088	0.006	2.40E-10	1.037	0.006	2.50E-10	1.005	0.006	2.50E-10
		mean ratio	3.321		mean ratio	0.926		mean ratio	1.247		mean ratio	1.474		
			Total RMS	2.235		Total RMS	2.109		Total RMS	1.989		Total RMS	2.065	
2 – 2,4-D choline + glyphosate	1	1.00E-09	0.023	0.762	4.40E-08	0.537	0.178	8.20E-08	0.981	0.559	8.40E-08	1.492	0.589	8.40E-08
	2	1.00E-09	0.193	0.076	5.20E-09	0.703	0.057	7.40E-09	0.993	0.058	7.40E-09	1.211	0.059	7.40E-09
	3	1.00E-09	1.552	0.037	6.40E-10	0.808	0.033	7.90E-10	0.833	0.032	9.50E-10	0.708	0.031	9.50E-10
	4	1.00E-09	2.998	0.101	3.30E-10	2.550	0.077	1.30E-10	2.481	0.061	5.20E-11	1.564	0.058	5.20E-11
	5	1.00E-09	0.471	0.200	2.10E-09	0.998	0.193	2.10E-09	0.966	0.197	2.20E-09	1.664	0.197	2.20E-09
	6	1.00E-09	3.755	0.034	2.70E-09	9.540	0.107	2.80E-10	1.093	0.006	2.60E-10	1.016	0.006	2.60E-10
	7	1.00E-09	2.517	0.023	4.00E-10	0.903	0.015	4.40E-10	0.982	0.015	4.50E-10	1.450	0.015	4.50E-10
	8	1.00E-09	4.830	0.049	2.10E-10	1.016	0.011	2.10E-10	1.016	0.011	2.10E-10	0.931	0.011	2.10E-10
		mean ratio	2.042		mean ratio	2.132		mean ratio	1.168		mean ratio	1.255		
			Total RMS	1.282		Total RMS	0.671		Total RMS	0.940		Total RMS	0.966	
3 - 2,4-D DMA	1	1.00E-09	0.028	0.576	3.60E-08	0.612	0.220	5.90E-08	0.992	0.147	5.90E-08	0.992	0.147	5.90E-08
	2	1.00E-09	0.239	0.050	4.20E-09	0.706	0.040	6.00E-09	0.996	0.039	6.00E-09	0.996	0.039	6.00E-09
	3	1.00E-09	1.734	0.029	5.80E-10	0.852	0.016	6.80E-10	0.916	0.016	7.40E-10	0.916	0.016	7.40E-10
	4	1.00E-09	3.393	0.083	3.00E-10	1.519	0.037	2.00E-10	1.255	0.031	1.60E-10	1.255	0.031	1.60E-10
	5	1.00E-	0.780	0.073	1.30E-	0.962	0.073	1.35E-	0.995	0.072	1.35E-	0.995	0.072	1.35E-

		09			09			09			09			09
	6	1.00E-09	5.116	0.030	2.00E-10	1.523	0.009	1.30E-10	1.198	0.009	1.10E-10	1.198	0.009	1.10E-10
	7	1.00E-09	3.714	0.020	2.70E-10	1.574	0.008	1.70E-10	1.282	0.008	1.30E-10	1.282	0.008	1.30E-10
	8	1.00E-09	6.433	0.042	1.60E-10	3.307	0.032	4.80E-11	2.890	0.032	1.70E-11	2.890	0.032	1.70E-11
		mean ratio	2.680		mean ratio	1.382		mean ratio	1.316		mean ratio	1.316		
			Total RMS	0.903		Total RMS	0.434		Total RMS	0.354		Total RMS	0.354	
4 – 2,4-D EHE	1	1.00E-09	0.030	0.315	3.30E-08	0.968	0.149	3.40E-08	1.378	0.133	2.50E-08	1.295	0.171	1.90E-08
	2	1.00E-09	0.027	0.148	3.70E-08	0.667	0.045	5.60E-08	0.995	0.089	5.60E-08	1.003	0.091	5.60E-08
	3	1.00E-09	0.243	0.061	4.10E-09	0.742	0.020	5.50E-09	0.774	0.023	5.30E-09	0.931	0.042	5.30E-09
	4	1.00E-09	0.302	0.061	3.30E-09	1.185	0.134	2.80E-09	1.110	0.123	2.50E-09	1.042	0.113	2.50E-09
	5	1.00E-09	0.146	0.137	6.80E-09	0.886	0.129	7.70E-09	0.990	0.128	7.80E-09	1.000	0.128	7.80E-09
	6	1.00E-09	0.226	0.101	4.40E-09	0.939	0.058	4.70E-09	1.003	0.055	4.70E-09	1.003	0.055	4.70E-09
	7	1.00E-09	0.732	0.016	1.40E-09	0.960	0.017	1.50E-09	1.030	0.017	1.50E-09	1.022	0.017	1.50E-09
	8	1.00E-09	1.235	0.011	8.10E-10	0.918	0.010	8.80E-10	1.087	0.010	8.10E-10	1.001	0.010	8.10E-10
		mean ratio	0.368		mean ratio	0.908		mean ratio	1.046		mean ratio	1.037		
			Total RMS	0.851		Total RMS	0.562		Total RMS	0.579		Total RMS	0.626	

Ty Ty, GA						
Treatment	Sample	Iteration 0	Iteration 1	Iteration 2	Iteration 3	

	period	flux	Predicted to measured ratio (mean)	RMS	flux	Predicted to measured ratio (mean)	RMS	flux	Predicted to measured ratio (mean)	RMS	flux	Predicted to measured ratio (mean)	RMS	final flux
1 – 2,4-D choline alone	1	1.00E-09	0.133	0.744	7.50E-09	0.880	0.533	8.50E-09	0.993	0.504	8.60E-09	1.003	0.501	8.60E-09
	2	1.00E-09	0.286	0.050	3.50E-09	0.929	0.038	3.80E-09	1.011	0.039	3.80E-09	1.013	0.038	3.80E-09
	3	1.00E-09	1.052	0.024	9.50E-10	0.827	0.034	1.10E-09	0.912	0.033	1.20E-09	0.978	0.032	1.20E-09
	4	1.00E-09	2.260	0.063	4.40E-10	1.173	0.013	3.75E-10	1.050	0.010	3.60E-10	1.020	0.009	3.60E-10
	5	1.00E-09	1.418	0.016	7.10E-10	0.972	0.012	7.30E-10	0.995	0.012	7.30E-10	0.993	0.012	7.30E-10
	6	1.00E-09	8.013	0.091	1.30E-10	2.281	0.014	5.70E-11	1.935	0.014	3.00E-11	1.781	0.014	3.00E-11
	7	1.00E-09	1.148	0.016	8.70E-10	0.921	0.012	9.40E-10	0.994	0.014	9.50E-10	1.005	0.014	9.50E-10
	8	1.00E-09	6.754	0.084	1.50E-10	1.013	0.008	1.50E-10	1.013	0.008	1.50E-10	1.013	0.008	1.50E-10
		mean ratio	2.633		mean ratio	1.124		mean ratio	1.113		mean ratio	1.101		
			Total RMS	1.088		Total RMS	0.665		Total RMS	0.632		Total RMS	0.628	
2 – 2,4-D choline + glyphosate	1	1.00E-09	0.056	1.042	1.80E-08	0.170	0.880	1.10E-07	0.851	0.321	1.30E-07	1.001	0.439	1.30E-07
	2	1.00E-09	1.111	0.026	9.00E-10	0.542	0.016	1.70E-09	0.896	0.017	1.90E-09	0.977	0.018	1.90E-09
	3	1.00E-09	3.766	0.053	2.70E-10	0.832	0.009	3.20E-10	0.833	0.009	3.80E-10	0.883	0.010	3.80E-10
	4	1.00E-09	6.074	0.063	1.65E-10	1.415	0.010	1.20E-10	1.603	0.018	6.90E-11	1.673	0.024	6.90E-11
	5	1.00E-09	2.680	0.056	3.70E-10	0.597	0.027	6.20E-10	0.810	0.024	7.70E-10	0.938	0.024	7.70E-10
	6	1.00E-09	6.452	0.075	1.60E-10	1.947	0.030	8.20E-11	1.788	0.031	4.60E-11	1.626	0.032	4.60E-11
	7	1.00E-09	1.117	0.014	9.00E-10	0.793	0.013	1.10E-09	0.960	0.013	1.15E-09	1.002	0.014	1.15E-09

	8	1.00E-09	6.822	0.068	1.50E-10	1.028	0.008	1.50E-10	0.991	0.008	1.50E-10	0.974	0.008	1.50E-10
		mean ratio	3.510		mean ratio	0.916		mean ratio	1.092		mean ratio	1.134		
			Total RMS	1.398		Total RMS	0.991		Total RMS	0.442		Total RMS	0.567	
3 - 2,4-D DMA	1	1.00E-09	0.057	0.947	1.80E-08	0.668	0.550	2.70E-08	0.963	0.462	2.90E-08			2.90E-08
	2	1.00E-09	0.128	0.109	7.80E-09	0.838	0.046	9.30E-09	0.999	0.042	9.30E-09			9.30E-09
	3	1.00E-09	3.047	0.059	3.30E-10	0.922	0.045	3.60E-10	0.978	0.044	3.60E-10			3.60E-10
	4	1.00E-09	5.282	0.084	1.90E-10	1.226	0.018	1.60E-10	1.123	0.018	1.60E-10			1.60E-10
	5	1.00E-09	2.346	0.019	4.30E-10	0.934	0.005	4.60E-10	0.994	0.005	4.60E-10			4.60E-10
	6	1.00E-09	8.773	0.091	1.10E-10	1.123	0.005	9.80E-11	1.057	0.004	9.80E-11			9.80E-11
	7	1.00E-09	2.475	0.017	4.00E-10	0.879	0.008	4.60E-10	1.006	0.007	4.60E-10			4.60E-10
	8	1.00E-09	10.600	0.082	9.40E-11	0.996	0.004	9.40E-11	0.996	0.004	9.40E-11			9.40E-11
		mean ratio	4.088		mean ratio	0.948		mean ratio	1.014					
			Total RMS	1.409		Total RMS	0.680		Total RMS	0.588				
4 – 2,4-D EHE		1.00E-09	0.059	0.261	1.70E-08	2.425	0.318	7.00E-09	2.776	0.443	2.45E-09			2.45E-09
		1.00E-09	0.015	0.476	6.80E-08	0.780	0.342	8.70E-08	0.992	0.349	8.70E-08			8.70E-08
		1.00E-09	0.126	0.394	7.90E-09	1.006	0.263	7.90E-09	0.971	0.265	7.90E-09			7.90E-09
		1.00E-09	0.119	0.353	8.40E-09	1.301	0.252	6.50E-09	1.121	0.253	6.50E-09			6.50E-09
		1.00E-09	0.047	0.232	2.10E-08	0.876	0.114	2.10E-08	0.876	0.114	2.10E-08			2.10E-08
		1.00E-09	0.472	0.057	2.10E-09	1.005	0.054	2.10E-09	1.010	0.053	2.10E-09			2.10E-09

		1.00E-09	0.247	0.035	4.00E-09	0.851	0.030	4.70E-09	0.991	0.033	4.70E-09			4.70E-09
		1.00E-09	0.906	0.036	1.10E-09	0.996	0.037	1.10E-09	0.996	0.037	1.10E-09			1.10E-09
		mean ratio	0.249		mean ratio	1.155		mean ratio	1.217					
			Total RMS	1.844		Total RMS	1.411		Total RMS	1.548				

13. APPENDIX F – BBCM OPTIMIZATION OF FIELD FLUXES – SUMMARY RESULTS

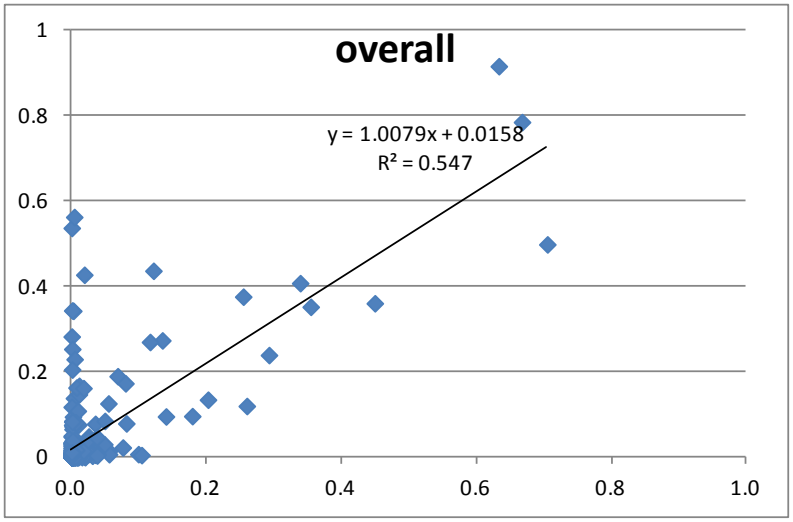
13.1. Farmland, IN

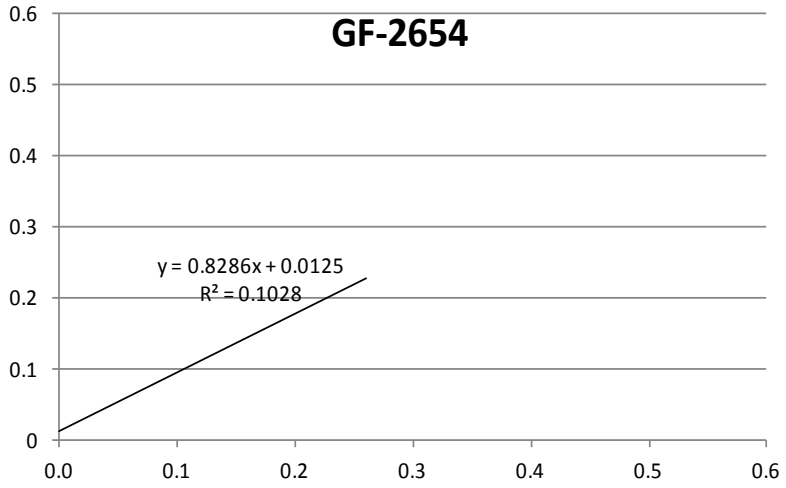
Number of evaluations: 3978 (converged)

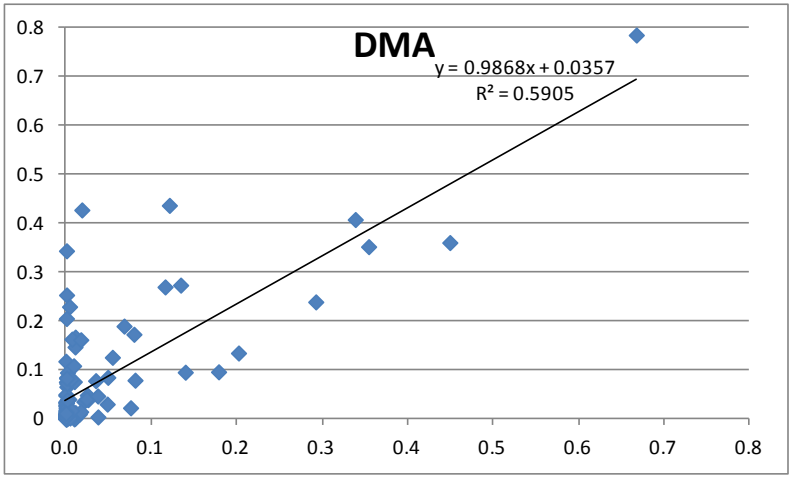
Final objective function (sum of squared residuals): 1.86

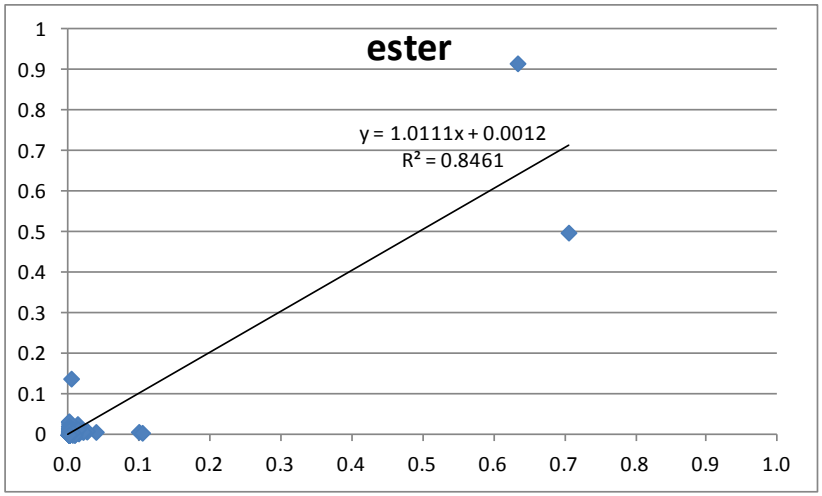
Final overall r^2 value: 0.55

Observed (y-axis) vs. modeled (x-axis) concentrations. Note that all slopes are close to unity, indicating the calculated fluxes are of the correct magnitude. R^ for GF-2654 low, others > 0.5.


overall
y = 1.0079x + 0.0158
R² = 0.547
0
0.2
0.4
0.6
0.8
1
0.0
0.2
0.4
0.6
0.8
1.0


GF-2654
y = 0.8286x + 0.0125
R² = 0.1028
0
0.1
0.2
0.3
0.4
0.5
0.6
0.0
0.1
0.2
0.3
0.4
0.5
0.6


DMA
y = 0.9868x + 0.0357
R² = 0.5905
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8


ester
y = 1.0111x + 0.0012
R² = 0.8461
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

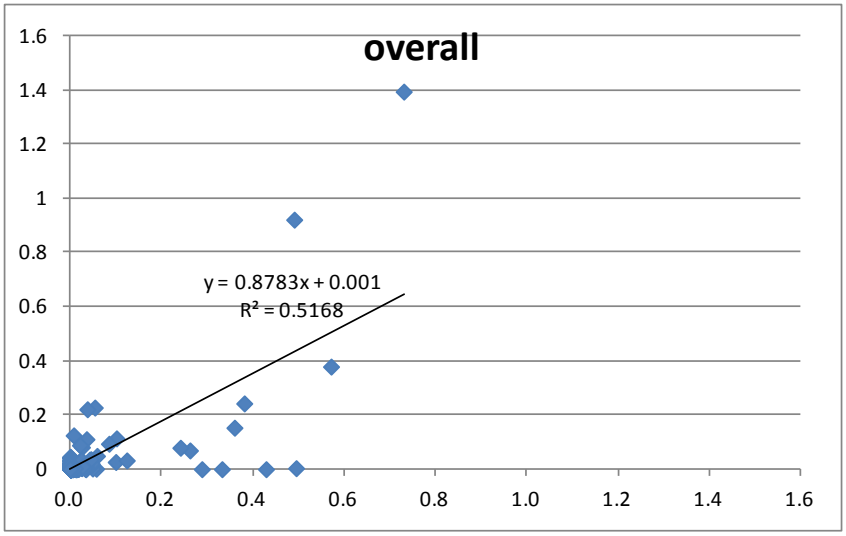
13.2. Fowler, IN

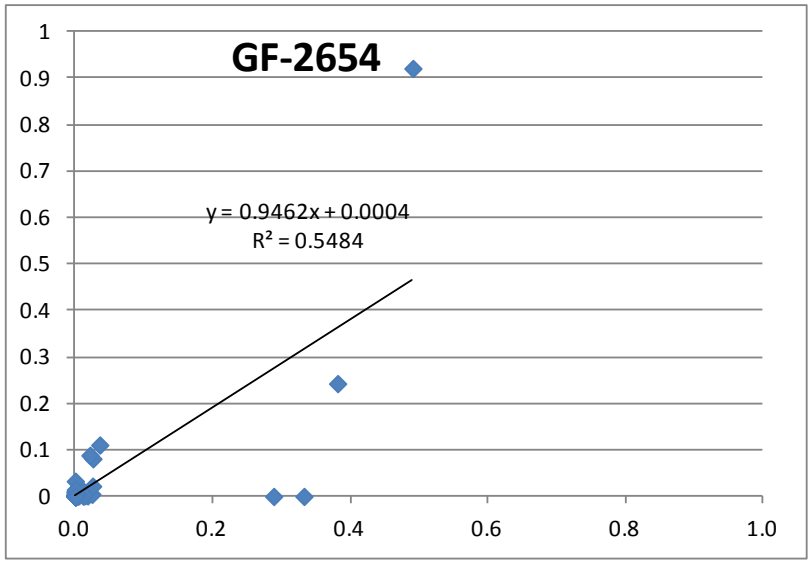
Number of evaluations: 4021(converged)

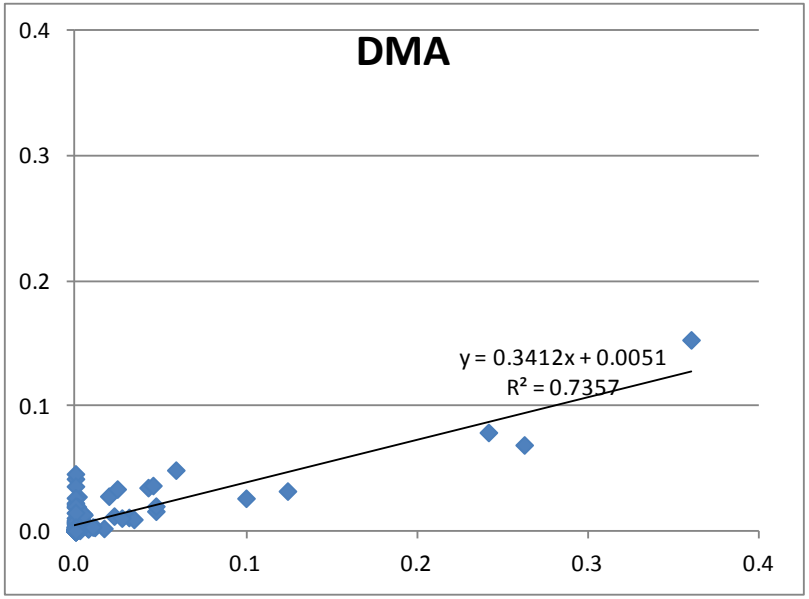
Final objective function (sum of squared residuals): 1.44

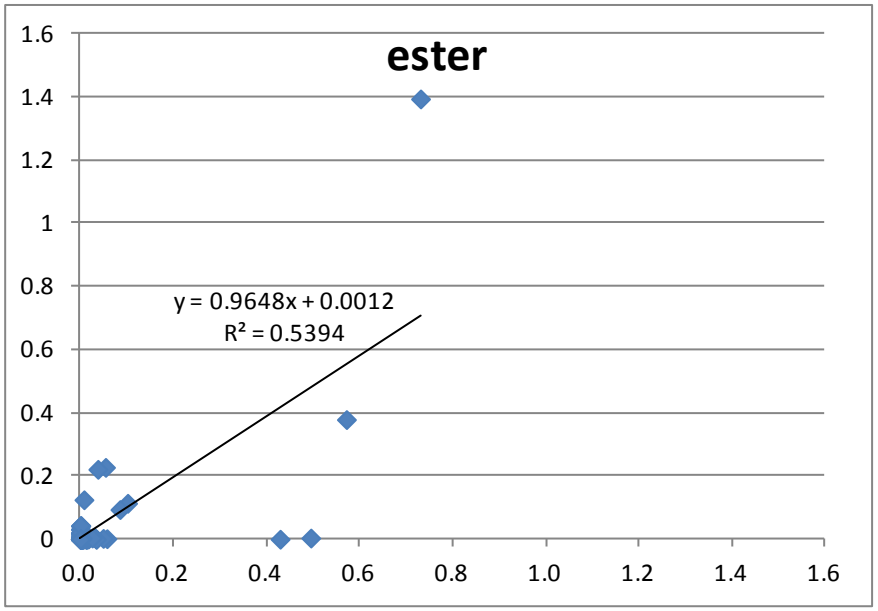
Final overall r^2 value: 0.54

Observed (y-axis) vs. modeled (x-axis) concentrations. Note that three of the four slopes are close to unity, indicating the calculated fluxes are of the correct magnitude and that r^2 values are all >0.5.









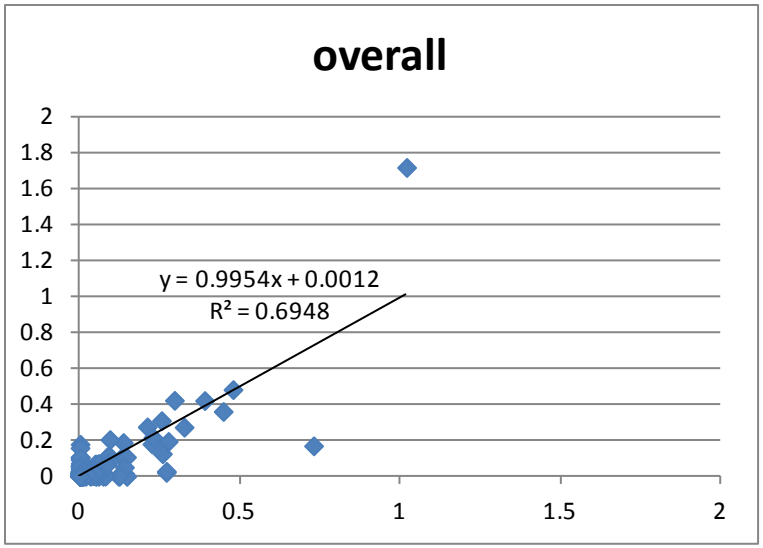
Little Rock, AR

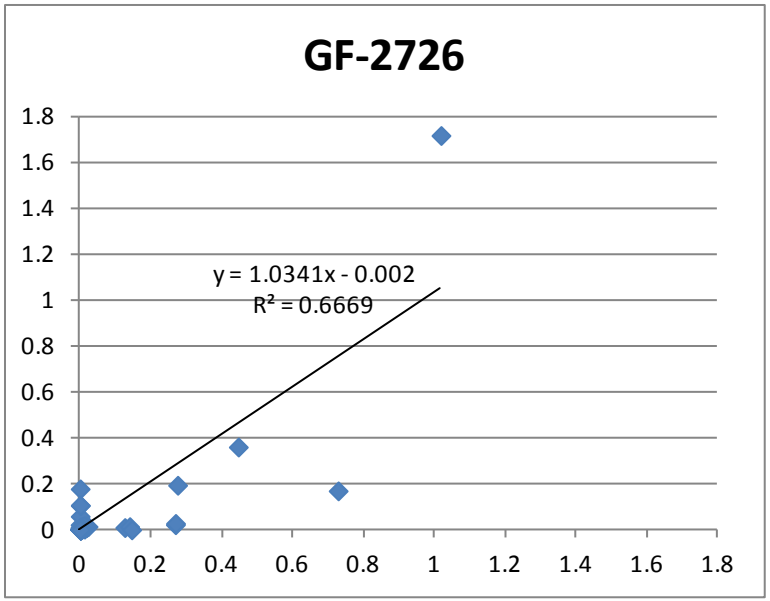
Number of evaluations: 10,000 (converged)

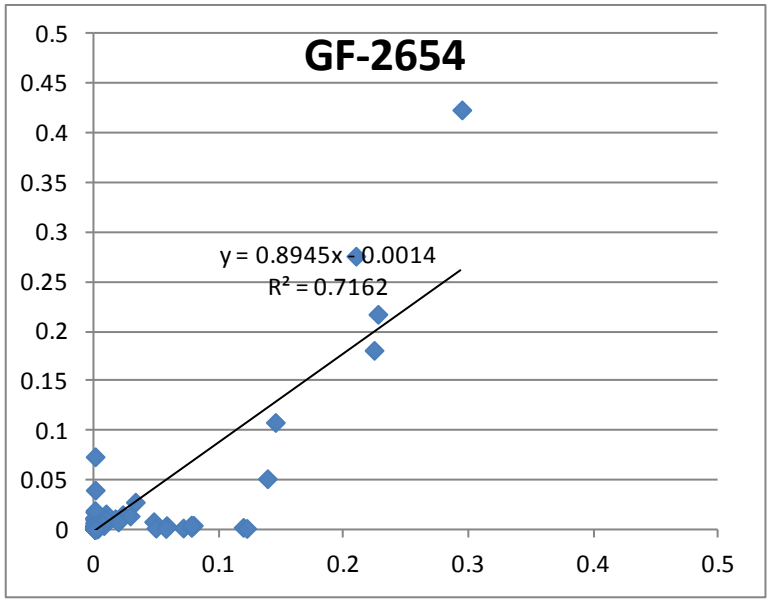
Final objective function (sum of squared residuals): 1.28

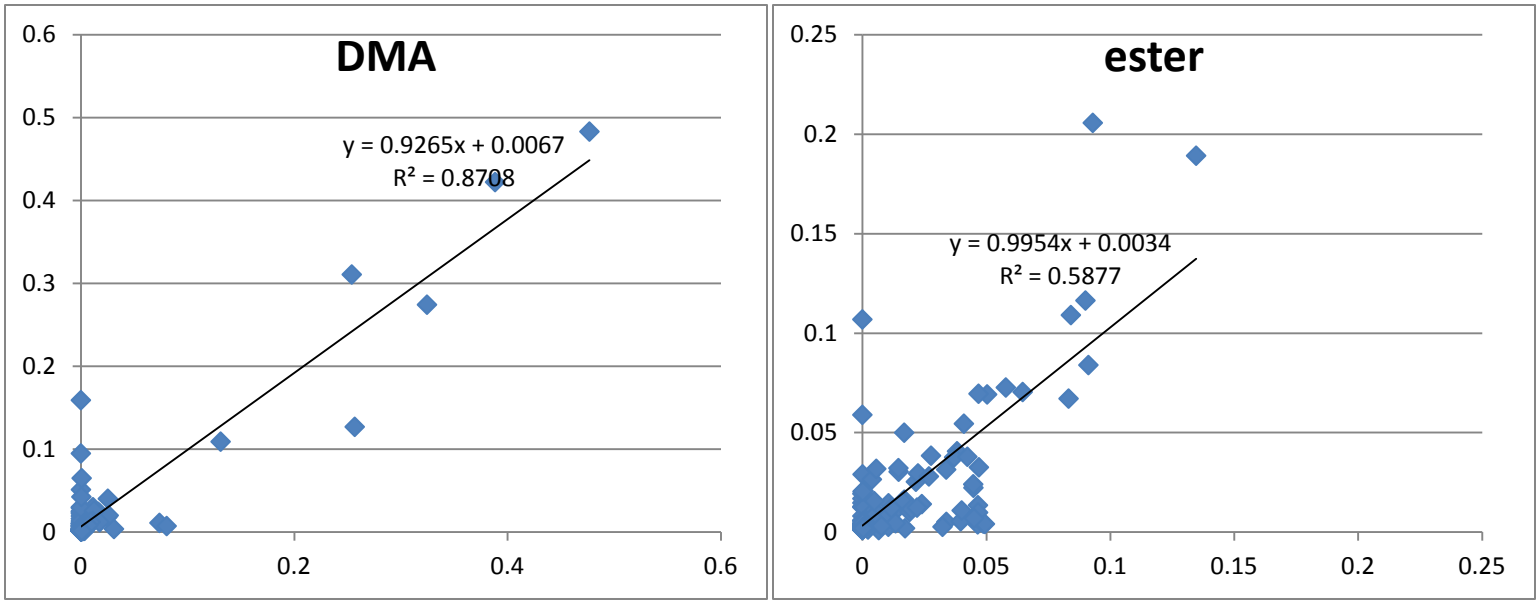
Final overall r^2 value: 0.695

Observed (y-axis) vs. modeled (x-axis) concentrations. Note that all slopes are close to unity, indicating the calculated fluxes are of the correct magnitude. One-to-one correlation is high.


overall
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
0.5
1
1.5
2
y = 0.9954x + 0.0012
R² = 0.6948


GF-2726
y = 1.0341x - 0.002
R² = 0.6669
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8


GF-2654
y = 0.8945x - 0.0014
R² = 0.7162
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
0.1
0.2
0.3
0.4
0.5



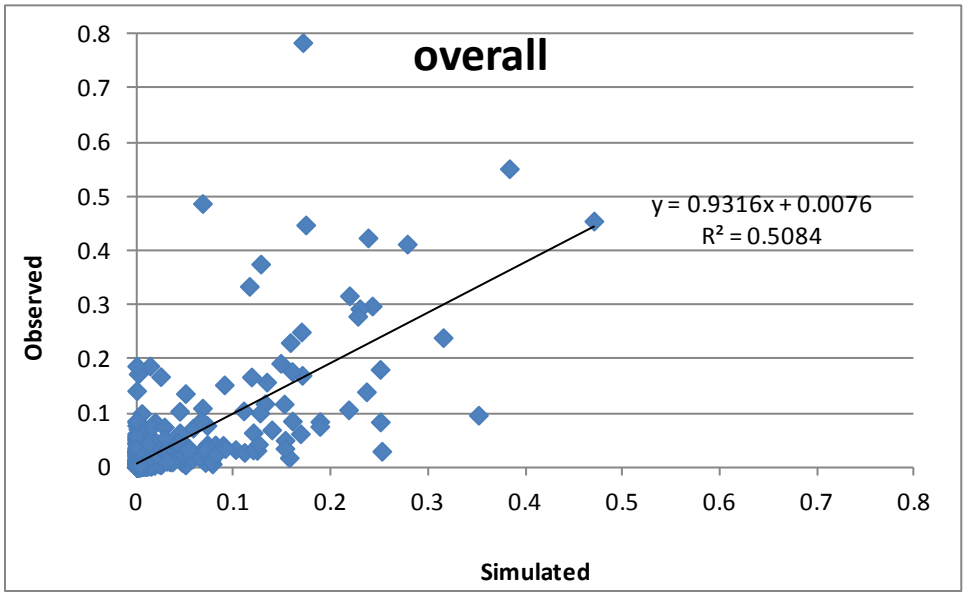
13.3. Ty Ty, GA

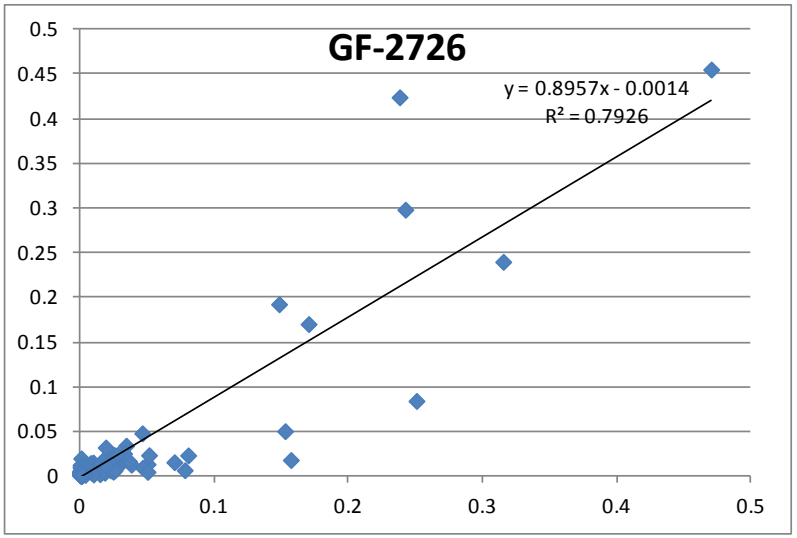
Number of evaluations: 6867 (converged)

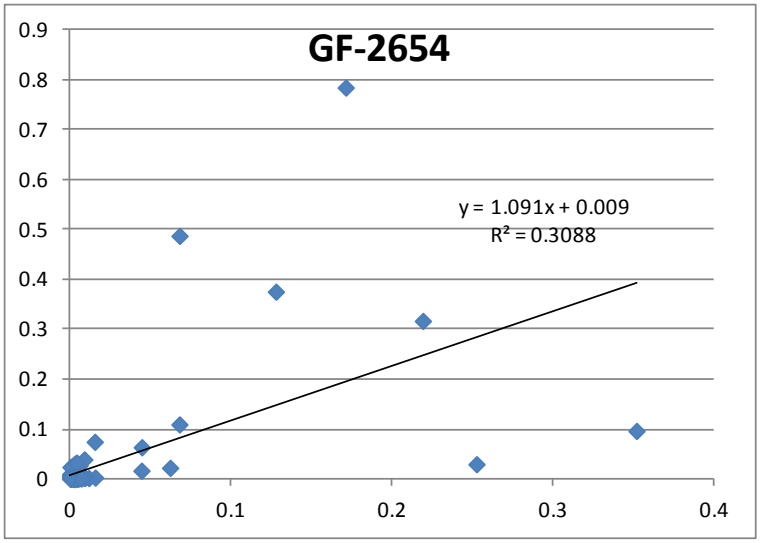
Final objective function (sum of squared residuals): 1.48

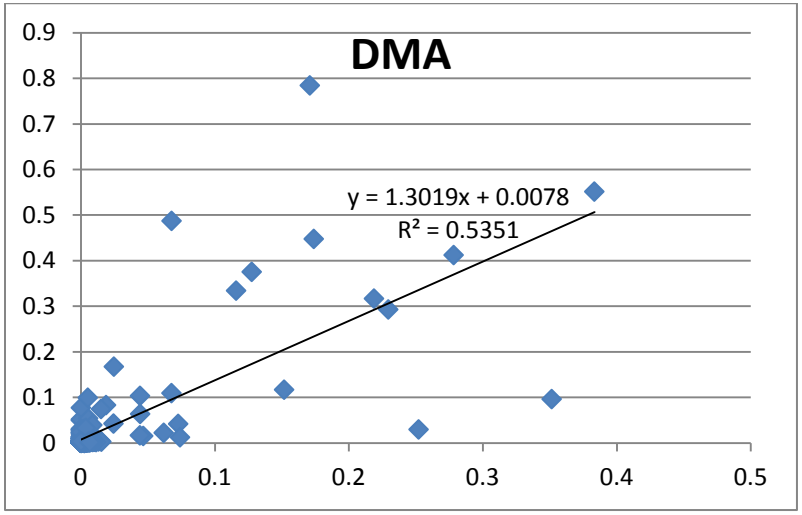
Final overall r^2 value: 0.73

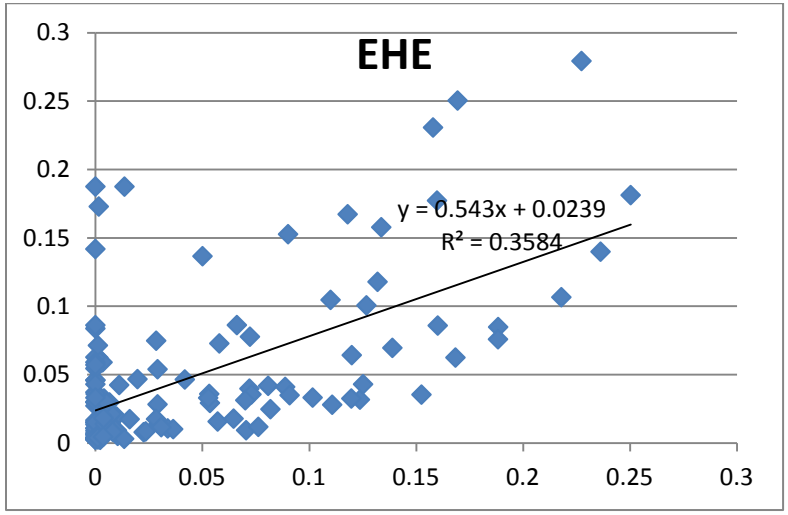
Observed (y-axis) vs. modeled (x-axis) concentrations. Overall fit is acceptable, with a slope close to unity. The best fit is for the GF-2726 treatment, indicating reasonable reliability of the flux estimates.




GF-2726
y = 0.8957x - 0.0014
R² = 0.7926
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
0.1
0.2
0.3
0.4
0.5


GF-2654
y = 1.091x + 0.009
R² = 0.3088
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.1
0.2
0.3
0.4


DMA
y = 1.3019x + 0.0078
R² = 0.5351
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.1
0.2
0.3
0.4
0.5


EHE
y = 0.543x + 0.0239
R² = 0.3584
0.3
0.25
0.2
0.15
0.1
0.05
0
0
0.05
0.1
0.15
0.2
0.25
0.3