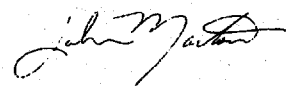


Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor**PMRA Submission Number 2006-2447****EPA MRID Number 468019-37**

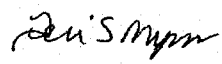
Data Requirement:	PMRA Data Code:	9.8.4 (TGAI) or 9.8.6 (EP)
	EPA DP Barcode:	D328639
	OECD Data Point:	IIA 8.12 (TGAI) and IIIA 10.8.1.1 (EP)
	EPA Guideline:	123-1b

Test material:	AE 0317309 03 EC23 A8	Purity: 3.45% wt/wt
Common name:	AE 0317309 (Pyrasulfotole)	
Chemical name:	IUPAC: 5-hydroxy-1,3-dimethylpyrazol-4-yl(2-mesyl-4-trifluoromethylphenyl)methanone	
	CAS name: Not reported	
	CAS No.: Not reported	
	Synonyms: Not reported	

Primary Reviewer: John Marton
Staff Scientist, Cambridge Environmental Inc.

Signature: 
Date: 5/14/06

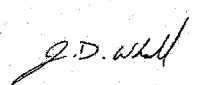
Secondary Reviewer: Teri S. Myers
Senior Scientist, Cambridge Environmental Inc.

Signature: 
Date: 5/22/06

Primary Reviewer: Melissa Panger
EPA

Date: 9/29/06 

Secondary Reviewer: J.D. Whall (Officer No. 1268)
PMRA

Date: 11/20/06 

Reference/Submission No.: {.....}

Company Code BCZ
Active Code PSA
Use Site Category: 13, 14 **EPA PC Code** 000692

Date Evaluation Completed: 12-01-2006

CITATION: Pallet, K. and H. Gosch. 2006. Non-target terrestrial plants: Vegetative Vigor test (Tier 2), AE 0317309+Mefenpyr di-ethyl+Bromoxynil (Code: AE 0317309 03 EC23 A8). Unpublished study performed by Bayer CropScience GmbH, Frankfurt am Main, Germany. Laboratory report number VV 05/002. Study sponsored by Bayer CropScience GmbH, Frankfurt am Main, Germany. Study completed on January 24, 2006.

DISCLAIMER: This document provides guidance for EPA and PMRA reviewers on how to complete a data evaluation record after reviewing a scientific study concerning the acute toxicity of a pesticide to terrestrial vascular plants. It is not intended to prescribe conditions to any external party for conducting this study nor to establish absolute criteria regarding the assessment of whether the study is scientifically sound and whether the study satisfies any applicable data requirements. Reviewers are expected to review and to determine for each study, on a case-by-case basis, whether it is scientifically sound and provides sufficient information to satisfy applicable data requirements. Studies that fail to meet any of the conditions may be accepted, if appropriate; similarly, studies that meet all of the conditions may be rejected, if appropriate. In sum, the reviewer is to take into account the totality of factors related to the test methodology and results in determining the acceptability of the study.



Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

EXECUTIVE SUMMARY:

The effect of AE 0317309 03 EC23 A8 (formulation containing the active ingredients AE 0317309 [pyrasulfotole] at 37.5 g a.i./L plus bromoxynil at 210 g a.i./L) on the vegetative vigor of monocot (corn, *Zea mays*; oat, *Avena sativa*; onion, *Allium cepa*; and ryegrass, *Lolium perenne*) and dicot (cucumber, *Cucumis sativus*; oilseed rape, *Brassica napus*; soybean, *Glycine max*; sugar beet, *Beta vulgaris*; sunflower, *Helianthus annuus* L.; tomato, *Lycopersicon esculentum*) crops was studied at varying nominal application rates. AE 0317309 03 EC23 A8 is proposed for use on selected cereal crops at a one time application rate of up to 1 L product/ha (or, 37.5 g a.i./ha pyrasulfotole) in the US, or 0.83 L product/ha (or, 31.1 g a.i./ha pyrasulfotole) in Canada (note: all rates in this report expressed as a.i. refer to levels of pyrasulfotole). Mean-measured application rates for corn and oat were 0 (negative control), 0.0019, 0.0037, 0.0075, 0.015 and 0.030 lbs ai/A (or, 0, 2.1, 4.1, 8.4, 16.8 and 33.6 g a.i./ha). Mean-measured application rates for onion and ryegrass were 0 (negative control), 0.00094, 0.0019, 0.0037, 0.0075, 0.015 and 0.030 lbs ai/A (or, 0, 1.1, 2.1, 4.1, 8.4, 16.8 and 33.6 g a.i./ha). Mean-measured application rates for cucumber, soybean, sugar beet and sunflower were 0 (negative control), 0.00012, 0.00023, 0.00047, 0.00094, 0.0019 and 0.0037 lbs ai/A (or, 0, 0.13, 0.26, 0.53, 1.1, 2.1 and 4.1 g a.i./ha). Mean-measured application rates for oilseed rape and tomato were 0 (negative control), 0.000063, 0.00012, 0.00023, 0.00047, 0.00094 and 0.0019 lbs ai/A (or, 0, 0.071, 0.13, 0.26, 0.53, 1.1 and 2.1 g a.i./ha). The growth medium used in the vegetative vigor test was natural soil classified as a silty loam with a pH of 7.4 and an organic carbon content of 1.19%. On Day 21 the surviving plants per pot were recorded and cut at soil level for measuring the plant height and dry weight.

In the vegetative vigor test, the plant dry weight, plant height and survival of all dicot species were affected by AE 0317309 03 EC23 A8 treatment. No monocot species exhibited reductions of $\geq 25\%$ for any endpoint; therefore, the reviewer could not identify a most sensitive monocot. The most sensitive dicot species, based on dry weight, was cucumber with an EC_{25} of 0.00017 lbs ai/A (0.19 g a.i./ha) and a NOAEC of <0.00012 lbs ai/A (<0.13 g a.i./ha). The EC_{05} and EC_{10} values for cucumber dry weight were determined using Nuthatch (0.000016 and 0.000038 lbs ai/A, respectively [or, 0.018 and 0.043 g a.i./ha]), however, there was considerable inhibition at all treatment levels, including 18% at the lowest level.

The following phytotoxic effects were noted: chlorosis, bleaching, necrosis, stunting, leaf deformation, wilting and growth suppression.

Maximum Labeled Rate: Not reported

Results Synopsis

Monocot

EC_{05}/IC_{05} : N/A 95% C.I.:

EC_{25}/IC_{25} : N/A 95% C.I.:

EC_{50}/IC_{50} : N/A 95% C.I.:

NOAEC: N/A

Slope: N/A

Std err: N/A

Most sensitive monocot: None

Most sensitive parameter: None

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Dicot

EC₀₅/IC₀₅: 0.000016 lbs ai/A (0.018 g a.i./ha) 95% C.I.: 0.0000022 – 0.00011 (0.0025 – 0.12 g a.i./ha)

EC₂₅/IC₂₅: 0.00017 lbs ai/A (0.19 g a.i./ha) 95% C.I.: 5.5E⁻⁰⁵-0.00053 lbs ai/A (0.062 – 0.59 g a.i./ha)

EC₅₀/IC₅₀: 0.00090 lbs ai/A (1.0 g a.i./ha) 95% C.I.: 0.00046-0.0017 lbs ai/A (0.52 – 1.9 g a.i./ha)

NOAEC: <0.00012 lbs ai/A (<0.13 g a.i./ha)

Slope: 0.935

Std err: 0.176

Most sensitive dicot: Cucumber

Most sensitive parameter: Dry Weight

This toxicity study is classified as **SUPPLEMENTAL** to the **US EPA** and **ACCEPTABLE** to the **PMRA** and does satisfy the guideline requirement for a Tier II terrestrial plant vegetative vigor toxicity study.

Table 1a. Summary of most sensitive parameters by species (lbs ai/A).

Species	Endpoint	NOAEC	EC ₀₅	EC ₂₅	EC ₅₀
Corn	Dry Weight	0.030	0.0077	>0.030	>0.030
Oat	Dry Weight	0.015	ND	>0.030	>0.030
Onion	Plant Height	0.015	ND	>0.030	>0.030
Ryegrass	Plant Height	0.015	0.024	>0.030	>0.030
Cucumber	Dry Weight	<0.00012	0.000016	0.00017	0.00090
Oilseed rape	Dry Weight	<0.000063	0.00029	0.00051	0.00077
Soybean	Dry Weight	0.00047	0.0016	0.0021	0.0026
Sugar beet	Dry Weight	0.00023	0.000032	0.00027	0.0012
Sunflower	Plant Height	0.00047	0.00010	0.00037	0.0011
Tomato	Dry Weight	0.00094	0.00074	0.0011	0.0015

Table 1b. Summary of most sensitive parameters by species (g a.i./ha).

Species	Endpoint	NOAEC	EC ₀₅	EC ₂₅	EC ₅₀
Corn	Dry Weight	33.6	8.6	>33.6	>33.6
Oat	Dry Weight	16.8	ND	>33.6	>33.6
Onion	Plant Height	16.8	ND	>33.6	>33.6
Ryegrass	Plant Height	16.8	26.9	>33.6	>33.6
Cucumber	Dry Weight	<0.13	0.018	0.19	1.0
Oilseed rape	Dry Weight	<0.071	0.33	0.57	0.86
Soybean	Dry Weight	0.53	1.8	2.4	2.9
Sugar beet	Dry Weight	0.26	0.036	0.30	1.3
Sunflower	Plant Height	0.53	0.11	0.41	1.2
Tomato	Dry Weight	1.1	0.83	1.2	1.7

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED:

The study followed guidelines outlined in US EPA Pesticide Assessment Guidelines, Sub-division J, Hazard Evaluation, Non-Target Plants, PB83-153940, EPA540/9-82-020, Series 123, Tier 2 of Non-Target Area Testing and OECD, Guideline for the testing of chemicals, Guideline 208, Terrestrial (Non-Target) Plant Test, 208 A, Seedling Emergence and Seedling Growth Test and 208 B, Vegetative Vigor test. The following deviations were noted:

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

1. The maximum label rate of the test material was not reported.
2. The physiochemical properties of the test material were not reported.
3. The LOQ and LOD were not reported.
4. The geographic location, CEC and moisture content at 1/3 atmospheres were not reported.
5. All species were tested under the same environmental conditions instead of testing cold-preferring species separately from warm-preferring species.
6. A NOAEC could not be identified for cucumber dry weight, the most sensitive endpoint, due to inhibition (18%) at the lowest treatment level (although this was not statistically significantly different than the control).
7. The reviewer was unable to statistically analyzed cucumber plant height and oilseed rape plant height as the raw data for these species and endpoints were not provided.
8. Pots were initially top watered to facilitate germination and establish the water column (prior to being treated). Thereafter, water was applied via subirrigation by adding water to saucers below the pots.
9. Minor deviations in temperature occurred for short periods of time when the temperature reached as high as 26°C and as low as 18°C. The same occurred with the relative humidity which ranged from 35 to 98%.

The deviations do not impact the acceptability of the study.

COMPLIANCE:

Signed and dated No Data Confidentiality, GLP and Quality Assurance statements were provided. This study was performed in compliance with the Principles of Good Laboratory Practice, Annex 1 to Chemicals Act of Federal Republic of Germany in the current version [Grundätze der Guten Laborpraxis (GLP), Anhang 1 zum Chemikaliengesetz der Bundesrepublik Deutschland in der aktuellen Fassung] based on the OECD Principles of Good Laboratory Practice as revised in 1997 and adopted November 26th, 1997 by decision of the OECD Council [C(97)186/Final].

A. MATERIALS:

1. Test Material AE 0317309 03 EC23 A8

Description: Amber Liquid

Lot No./Batch No. : 04KLE001P059 (Batch No.)

Purity: 3.45% wt/wt

Stability of compound under test conditions: Samples of the stock solutions were collected at Day 0 and analyzed for AE 0317309. The recovery was 99.4-100.3% of nominal. (*OECD recommends chemical stability in water and light*)

Storage conditions of test chemicals: Stored under ambient conditions.

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Table 2. Physical/chemical properties of AE 0317309 03 EC23 A8.

Parameter	Values	Comments
Water solubility at 20EC	Not reported	
Vapor pressure	Not reported	
UV absorption	Not reported	
pKa	Not reported	
Kow	Not reported	

2. Test organism:

Monocotyledonous species: Corn (*Zea mays*, Family Poaceae, Lorenzo), Oat (*Avena sativa*, Family Poaceae, Flämings Nova), Onion (*Allium cepa*, Family Liliaceae, Braunschweiger Blutrote) and Ryegrass (*Lolium perenne*, Family Poaceae, Deutsches Weidegras); *EPA recommends four monocots in two families, including corn.*

Dicotyledonous species: Cucumber (*Cucumis sativus*, Family Cucurbitaceae, Delikatess), Oilseed rape (*Brassica napus*, Family Brassicaceae, Licapo), Soybean (*Glycine max*, Family Fabaceae, Erin), Sugar beet (*Beta vulgaris*, Family Chenopodiaceae, Achat), Sunflower (*Helianthus annuus L.*, Family Asteraceae, Big Smile) and Tomato (*Lycopersicon esculentum*, Family Solanaceae, Balkonstar); *EPA recommends six dicots in four families, including soybean and a root crop.*

OECD recommends a minimum of three species selected for testing, at least one from each of the following categories: Category 1: ryegrass, rice, oat, wheat, and sorghum; Category 2: mustard, rape, radish, turnip, and Chinese cabbage; Category 3: vetch, mung bean, red clover, fenugreek, lettuce, and cress.

Seed source: Seeds were supplied from commercial sources via Bayer CropScience GmbH, Horticulture, H872, 65926 Frankfurt am Main.

Prior seed treatment/sterilization: None

Historical % germination of seed: Germination was not reported; however, the study authors reported that germination tests were conducted to ensure viability of the seeds.

Seed storage, if any: Seeds were stored in plastic boxes in the refrigerator

B. STUDY DESIGN:

1. Experimental Conditions

- Limit test: A limit test was not conducted.
- Range-finding study: A range-finding study was not conducted.
- Definitive Study

Table 3: Experimental Parameters - Vegetative Vigor

Parameters	Vegetative Vigor
------------	------------------

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

	Details	Remarks
		Criteria
Duration of the test	21 Days	<i>Recommended test duration is 14-21 days.</i>
Number of seeds/plants replicate	<u>Cucumber, Soybean, Sunflower and Tomato:</u> 4 plants/rep <u>Oilseed rape, Sugar beet, Corn, Oat, Onion and Ryegrass:</u> 5 plants/rep	<i>Five plants per replicate are recommended.</i>
Number of plants retained after thinning	The number of plants prior to thinning was not reported. The reported number of plants/rep and reps/level were the numbers retained after thinning.	A total of 40 plants were used in each control and treatment level.
Number of replicates Control: Adjuvant control: Treated:	<u>Cucumber, Soybean, Sunflower and Tomato:</u> 10 reps/control and treatment <u>Oilseed rape, Sugar beet, Corn, Oat, Onion and Ryegrass:</u> 8 reps/control and treatment	A solvent control was not used. <i>Four replicates per dose are recommended</i>

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Parameters	Vegetative Vigor	
	Details	Remarks
		<i>Criteria</i>
<u>Test concentrations (mg ai/kg soil and g ai/ha)</u> Nominal: Nominal: Nominal: Nominal: Measured:	<u>Corn and Oat:</u> 0 (negative control), 0.0021, 0.0041, 0.0083, 0.017 and 0.033 lbs ai/A <u>Onion and Ryegrass:</u> 0 (negative control), 0.0010, 0.0021, 0.0041, 0.0083, 0.017 and 0.033 lbs ai/A <u>Cucumber, Soybean, Sugar beet and Sunflower:</u> 0 (negative control), 0.00013, 0.00026, 0.00052, 0.0010, 0.0021 and 0.0041 lbs ai/A <u>Oilseed rape and Tomato:</u> 0 (negative control), 0.000070, 0.00013, 0.00026, 0.00052, 0.0010 and 0.0021 lbs ai/A See Reviewer's Comments	<i>Five test concentrations should be used with a dose range of 2X or 3X progression</i>
<u>Method and interval of analytical verification</u> LOQ: LOD:	Samples were analyzed on Day 0 using HPLC Not reported Not reported	
Adjuvant (type, percentage, if used)	N/A	An adjuvant was not used.
<u>Test container (pot)</u> Size/Volume Material: (glass/polystyrene)	10 cm diameter (onion) 13 cm diameter (all other species) Plastic	Pots were commercial plastic flower pots. <i>Non-porous containers should be used.</i> <i>OECD recommends that non-porous plastic or glazed pots be used.</i>
Growth facility	On-site greenhouse	
Method/depth of seeding	Seeds were introduced manually introduced into the soil. Seeds were covered by up to 5 mm of soil and top watered immediately to facilitate germination. The size of the seed	

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Parameters	Vegetative Vigor	
	Details	Remarks
		Criteria
	determined the sowing depth, i.e. 5 mm diameter seeds covered by 5 mm soil and 2 mm diameter seeds covered by 3 mm soil. To reach the 2-4 true leaf stage at the start of testing, sowing was started 15-41 days prior to testing.	
<u>Test material application</u> Application time including the plant growth stage	Test material was applied to all plants at the 2-4 true leaf stage.	
Number of application	1	
Application interval	N/A; single application	
Method of application	Spray booth equipped with a laboratory track sprayer	
<u>Details of soil used</u> Geographic location Depth of soil collection Soil texture % sand % silt % clay pH: % organic carbon CEC Moisture at 1/3 atm (%)	Not reported 2 mm Silty loam 14.2% 65.1% 20.7% 7.4 1.19% Not reported Not reported	Soil was obtained from Bayer CropScience GmbH, Global Biology Herbicides, Horticulture, H 872, Industriepark Hoechst, 65926 Frankfurt am Main. Onion soil was 'loamy sand' (pH = 6.74 and percent organic = 1.7%). <i>EPA prefers soil mixes containing sandy loam, loam, or clay loam soil with no greater than 2% organic matter. Glass beads, rock wool, and 100% acid washed sand are not preferred..</i> <i>OECD prefers the soil to be sieved (0.5 cm) to remove coarse fragments. Carbon content should not exceed 1.5% (3% organic matter). Fine particles (under 20um) makeup should be between 10 and 20%. The recommended pH is between 5.0 and 7.5.</i>

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Parameters	Vegetative Vigor	
	Details	Remarks
		<i>Criteria</i>
Details of nutrient medium, if used	A solution of 0.1% liquid fertilizer (Wurax super) was given February 03 and February 08, 2005 to all species.	
<u>Watering regime and schedules</u> Water source/type: Volume applied: Interval of application: Method of application:	Local tap water As needed At least once per day Pots were initially top watered to facilitate germination and establish the water column. Thereafter, water was applied via subirrigation by adding water to saucers below the pots.	<i>EPA prefers that under foliage watering or bottom watering be utilized for vegetative vigor studies so that the chemical is not washed out of the soil during the test.</i>
Any pest control method/fertilization, if used	Soil was sterilized via 120 degrees of vapor for about 30 minutes. The soil received 2.4 g/L of granular fertilizer (Blauforn) prior to sowing.	No pest control was reported.
<u>Test conditions</u> Temperature: Photoperiod: Light intensity and quality: Relative humidity:	18-26°C 16L:8D 10000-20000 35-98%	Minor deviations in temperature occurred for short periods of time when the temperature reached as high as 26°C and as low as 18°C. Natural day light was supplemented by artificial lighting to provide the required photoperiod. Regulation of light intensity >10000 lux lamps turn off, >20000 lux shading closing. <i>EPA prefers that the cold vs warm loving plants be tested in two separate groups to optimize plant growth.</i> <i>OECD prefers that the temperature, humidity and light conditions be suitable for maintaining normal growth of each species for the test period.</i>
<u>Reference chemical (if used)</u> Name: Concentrations:	N/A N/A	A reference chemical was not used.
Other parameters, if any	None	

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

2. Observations:

Table 4: Observation Parameters - Vegetative Vigor

Parameters	Vegetative Vigor	
	Details	Remarks
Parameters measured (i.e., plant height, dry weight or other endpoints)	Survival, phytotoxicity, growth stage, plant dry weight and length.	
Measurement technique for each parameter	Survival was determined by visual enumeration. Plant length was determined by measuring the total shoot height (i.e. longest leaf) to the nearest 0.1 cm. Dry weight was determined using a balance and weight to the nearest 0.001 g. Phytotoxicity was determined using a numerical rating system.	
Observation intervals	Survival and phytotoxicity were determined weekly. Dry weight, plant height and growth stage were determined at test termination (Day 21).	
Other observations, if any	None	
Were raw data included?	All raw data were provided with the exception of cucumber and oilseed rape plant height. The study authors do not report why these data were not included.	
Phytotoxicity rating system, if used	Phytotoxicity was described using a percentage, which reflected the extent of the symptom. 0%- no injury or effect; 10-20%- slight symptoms throughout the whole plant or more moderate symptoms on a small area; 30-40%- moderate symptoms throughout the whole plant or severe symptoms on a limited area; 50-60%- severe symptoms throughout the	Any plant considered dead was not rated for phytotoxicity.

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Parameters	Vegetative Vigor	
	Details	Remarks
	whole plant with younger or newly developed leaves growing normally; 70-80%-total plant symptoms with the plant showing poor vigor; 90%- moribund or dying plant	

II. RESULTS and DISCUSSION:

A. INHIBITORY EFFECTS:

Vegetative Vigor:

No monocot species exhibited a reduction of >25% for any of the endpoints analyzed; although ryegrass did exhibit significant reductions in dry weight and plant height. All dicot species exhibited reductions of >25% for all endpoints analyzed (dry weight, plant height and survival). The responses of the endpoints did not appear completely linear; however, they did appear to be dose-dependent. As no monocot exhibited reductions of >25%, the reviewer cannot accurately identify a most sensitive monocot species. The most sensitive dicot species, based on dry weight, was cucumber with study author-reported NOAEC and EC₂₅ values of 0.00012 (0.13 g a.i./ha) and 0.000231 lbs ai/A (0.26 g a.i./ha), respectively.

The following effects were noted: chlorosis, bleaching, necrosis, stunting, leaf deformation, wilting and growth suppression. Phytotoxicity was described using a percentage, which reflected the extent of the symptom. 0%- no injury or effect; 10-20%- slight symptoms throughout the whole plant or more moderate symptoms on a small area; 30-40%- moderate symptoms throughout the whole plant or severe symptoms on a limited area; 50-60%- severe symptoms throughout the whole plant with younger or newly developed leaves growing normally; 70-80%- total plant symptoms with the plant showing poor vigor; 90%- moribund or dying plant.

B. REPORTED STATISTICS:

The data from all treatment levels was compared to each species respective negative control. Mortality and dry weight were compared using the ToxRat software for statistical analysis (version 2.09). Plant height was also analyzed by comparing treatment data to the control data; however, the statistical software used was not reported.

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Table 5: Reported effect of AE 0317309 03 EC23 A8 on Vegetative Vigor

Species	Results summary for biomass (lbs ai/A)									
	g*	NOAEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	slope	std err
Corn	2.903-3.330	0.030	ND	ND	>0.030	N/A	>0.030	N/A	ND	ND
Oat	1.015-1.421	0.030	ND	ND	>0.030	N/A	>0.030	N/A	ND	ND
Onion	0.101-0.162	0.030	ND	ND	>0.030	N/A	>0.030	N/A	ND	ND
Ryegrass	0.521-0.732	0.015	ND	ND	>0.030	N/A	>0.030	N/A	ND	ND
Cucumber	0.773-2.841	0.00012	ND	ND	0.000231	0.0000330-0.000429	0.000102	0.000561-0.00221	ND	ND
Oilseed Rape	0.308-2.712	0.00047	ND	ND	0.00056	ND	0.000825	0.0000330-0.00614	ND	ND
Soybean	0.872-1.484	0.00047	ND	ND	0.00090	ND	0.00211	ND	ND	ND
Sugar beet	0.494-1.523	0.00047	ND	ND	0.000396	ND	0.00155	ND	ND	ND
Sunflower	0.238-1.434	0.00047	ND	ND	0.000594	ND	0.000924	ND	ND	ND
Tomato	0.434-1.779	0.00094	ND	ND	0.00145	0.00142-0.00145	0.00178	0.00178-0.00178	ND	ND

* range provided represents the range of the treatment means

N/A- Not applicable

ND- Not determined

NR- Not reported

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Table 5a: Reported effect of AE 0317309 03 EC23 A8 on Vegetative Vigor

Species	Results summary for height (lbs ai/A)									
	cm*	NOAEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	slope	std err
Corn	97.8-101.05	0.030	ND	ND	>0.030	N/A	>0.030	N/A	ND	ND
Oat	74.825-83.400	0.030	ND	ND	>0.030	N/A	>0.030	N/A	ND	ND
Onion	23.069-27.825	0.030	ND	ND	>0.030	N/A	>0.030	N/A	ND	ND
Ryegrass	37.900-44.725	0.015	ND	ND	>0.030	N/A	>0.030	N/A	ND	ND
Cucumber ^A		0.00023	ND	ND	0.000462	0.0000330-0.000924	0.00149	0.000660-0.00597	ND	ND
Oilseed Rape ^A		0.00047	ND	ND	0.00102	0.000462-0.00135	0.00191	0.00142-0.00353	ND	ND
Soybean	15.111-27.800	0.00047	ND	ND	0.00261	ND	>0.0037	N/A	ND	ND
Sugar beet	12.083-19.800	0.00047	ND	ND	0.00142	ND	>0.0037	ND	ND	ND
Sunflower	3.917-11.175	0.00012	ND	ND	0.000495	ND	0.00139	ND	ND	ND
Tomato	10.676-21.025	0.00094	ND	ND	0.00139	ND	0.00162	0.00158-0.00162	ND	ND

* range provided represents the range of the treatment means

^A Raw Data Not Provided

N/A- Not applicable

ND- Not determined

NR- Not reported

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Table 5b: Reported effect of AE 0317309 03 EC23 A8 on Vegetative Vigor

Species	Results summary for survival (lbs ai/A)									
	%*	NOAEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	slope	std err
Corn	100	0.030	ND	ND	>0.030	N/A	>0.030	N/A	ND	ND
Oat	100	0.030	ND	ND	>0.030	N/A	>0.030	N/A	ND	ND
Onion	93-100	0.030	ND	ND	>0.030	N/A	>0.030	N/A	ND	ND
Ryegrass	100	0.030	ND	ND	>0.030	N/A	>0.030	N/A	ND	ND
Cucumber	45-100	0.0019	ND	ND	0.00257	0.00152-0.00449	0.00360	0.00238-0.00924	ND	ND
Oilseed Rape	13-100	0.00047	ND	ND	0.00092	0.000792-0.00106	0.00129	0.00112-0.00149	ND	ND
Soybean	69-100	0.0019	ND	ND	0.00234	0.000264->0.0041	0.00317	0.00132->0.0041	ND	ND
Sugar beet	15-100	0.00047	ND	ND	0.00106	0.00050-0.00152	0.00158	0.00120-0.00257	ND	ND
Sunflower	8-100	0.00047	ND	ND	0.000858	0.00036-0.00125	0.00125	0.00079-0.00205	ND	ND
Tomato	68-100	0.00094	ND	ND	0.00116	0.00007-ND	0.00155	ND	ND	ND

* range provided represents the range of the treatment means

N/A- Not applicable

ND- Not determined

NR- Not reported

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Plant Injury Index*											
Control	Corn	Oat	Onion	Ryegrass	Cucumber	Oilseed Rape	Soybean	Sugar Beet	Sunflower	Tomato	Adjuvant control
0%	0%	0-10%	0-7%	0-30%	0-86.7%	0-90%	0-85%	0-90%	0-100%	0-90%	N/A

*0%- no injury or effect; 10-20%- slight symptoms throughout the whole plant or more moderate symptoms on a small area; 30-40%- moderate symptoms throughout the whole plant or severe symptoms on a limited area; 50-60%- severe symptoms throughout the whole plant with younger or newly developed leaves growing normally; 70-80%- total plant symptoms with the plant showing poor vigor; 90%- moribund or dying plant

C. VERIFICATION OF STATISTICAL RESULTS BY THE REVIEWER:

Statistical Method(s): Replicate data for dry weight, plant height and percent survival were first tested for the assumptions of ANOVA (normality and homogeneity) for any species exhibited a $\geq 5\%$ reduction relative to the negative control. If these assumptions were met, the NOAEC values were determined by comparing the treatment data against the negative control data using the parametric Dunnetts Test (or Bonferonni's T-Test for unequal replicates) and William's Test. If the assumptions of ANOVA were not met, the NOAEC values were determined by comparing the treatment data against the negative control data using the non-parametric Kruskal-Wallis test. All NOAEC values were determined using Toxstat statistical software. Phytotoxicity was not reported as this is not a quantitative endpoint. The ECx values (with corresponding 95% C.I.) and probit slopes (when applicable) were determined using Nuthatch statistical software. When the % reduction was <5 , <25 or $<50\%$, the respective ECx values were determined visually. When 100% mortality was observed in the highest treatment level, these data were excluded from the analyses. All toxicity values were determined using the mean-measured application rates. The raw data for cucumber plant height and oilseed rape plant height were not provided; therefore, the reviewer was unable to analyze these species and endpoints.

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Table 6: Reviewer-calculated effect of AE 0317309 03 EC23 A8 on Vegetative Vigor

Species	Results summary for biomass (lbs ai/A)									
	g*	NOAEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	slope	std err
Corn	2.903-3.330	0.030	0.0077	1.6E ⁻⁰⁶ -38	>0.030	N/A	>0.030	N/A	0.301	0.597
Oat	1.015-1.421	0.015	ND	ND	>0.030	N/A	>0.030	N/A	ND	ND
Onion	0.101-0.162	0.030	ND	ND	>0.030	N/A	>0.030	N/A	ND	ND
Ryegrass	0.521-0.732	0.015	0.012	0.0035-0.039	>0.030	N/A	>0.030	N/A	2.03	1.27
Cucumber	0.773-2.841	<0.00012	<0.00012	N/A	0.00017	5.5E ⁻⁰⁵ -0.00053	0.00090	0.00046-0.0017	0.935	0.176
Oilseed Rape	0.308-2.712	<0.000063	0.00029	0.00018-0.00045	0.00051	0.00039-0.00067	0.00077	0.00065-0.00091	3.82	0.641
Soybean	0.872-1.484	0.00047	0.0016	0.0012-0.0021	0.0021	0.0018-0.0026	0.0026	0.0023-0.0030	7.49	1.33
Sugar beet	0.494-1.523	0.00023	<0.00012	N/A	0.00027	8.5E ⁻⁰⁵ -0.00086	0.0012	0.00059-0.0024	1.05	0.255
Sunflower	0.238-1.434	0.00047	<0.00012	N/A	0.00037	0.00016-0.00085	0.00089	0.00053-0.0015	1.76	0.428
Tomato	0.434-1.779	0.00094	0.00074	0.00052-0.0011	0.0011	0.00090-0.0014	0.0015	0.0013-0.0017	5.48	1.11

* range provided represents the range of the treatment means

N/A- Not applicable

ND- Not determined

NR- Not reported

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Table 6a: Reviewer-calculated effect of AE 0317309 03 EC23 A8 on Vegetative Vigor

Species	Results summary for height (lbs ai/A)									
	cm*	NOAEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	slope	std err
Corn	97.8-101.05	0.030	>0.030	N/A	>0.030	N/A	>0.030	N/A	N/A	N/A
Oat	74.825-83.400	0.030	ND	ND	>0.030	N/A	>0.030	N/A	ND	ND
Onion	23.069-27.825	0.015	ND	ND	>0.030	N/A	>0.030	N/A	ND	ND
Ryegrass	37.900-44.725	0.015	0.024	0.012-0.048	>0.030	N/A	>0.030	N/A	4.78	6.91
Cucumber ^A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Oilseed Rape ^A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Soybean	15.111-27.800	0.00047	0.0017	0.0011-0.0024	0.0029	0.0025-0.0033	>0.0037	N/A	4.15	1.00
Sugar beet	12.083-19.800	0.00047	0.00012	2.8E ⁻⁰⁵ -0.00055	0.0010	0.00052-0.0019	>0.0037	N/A	1.07	0.242
Sunflower	3.917-11.175	0.00047	<0.00012	N/A	0.00037	0.00021-0.00067	0.0011	0.00080-0.0016	1.40	0.216
Tomato	10.676-21.025	0.00094	0.00082	0.00058-0.0012	0.0014	0.0012-0.0016	>0.0019	N/A	4.31	0.899

* range provided represents the range of the treatment means

^A Raw Data Not Provided

N/A- Not applicable

ND- Not determined

NR- Not reported

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Table 6b: Reported effect of AE 0317309 03 EC23 A8 on Vegetative Vigor

Species	Results summary for survival (lbs ai/A)									
	Survival relative to controls (%)*	NOAEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	slope	std err
Corn	100	0.030	>0.030	N/A	>0.030	N/A	>0.030	N/A	N/A	N/A
Oat	100	0.030	>0.030	N/A	>0.030	N/A	>0.030	N/A	N/A	N/A
Onion	93-100	0.030	>0.030	N/A	>0.030	N/A	>0.030	N/A	N/A	N/A
Ryegrass	100	0.030	>0.030	N/A	>0.030	N/A	>0.030	N/A	N/A	N/A
Cucumber	45-100	0.0019	0.0021	0.0012-0.0036	0.0029	0.0022-0.0037	0.0036	0.0033-0.0038	7.21	3.42
Oilseed Rape	13-100	0.00047	0.00053	0.00040-0.00071	0.00083	0.00068-0.0010	0.0011	0.00099-0.0013	5.07	0.681
Soybean	69-100	0.0019	ND	ND	ND	ND	>0.0037	N/A	ND	ND
Sugar beet	15-100	0.00047	0.00032	0.00015-0.00069	0.00072	0.00044-0.0012	0.0013	0.00091-0.0017	2.79	0.526
Sunflower	8-100	0.00047	0.00029	0.00016-0.00052	0.00059	0.00040-0.00087	0.00097	0.00075-0.0013	3.11	0.472
Tomato	68-100	0.00094	ND	ND	ND	ND	>0.0019	N/A	ND	ND

* range provided represents the range of the treatment means

N/A- Not applicable

ND- Not determined

NR- Not reported

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Plant Injury Index*											
Control	Corn	Oat	Onion	Ryegrass	Cucumber	Oilseed Rape	Soybean	Sugar Beet	Sunflower	Tomato	Adjuvant control
0%	0%	0-10%	0-7%	0-30%	0-86.7%	0-90%	0-85%	0-90%	0-100%	0-90%	N/A

*0%- no injury or effect; 10-20%- slight symptoms throughout the whole plant or more moderate symptoms on a small area; 30-40%- moderate symptoms throughout the whole plant or severe symptoms on a limited area; 50-60%- severe symptoms throughout the whole plant with younger or newly developed leaves growing normally; 70-80%- total plant symptoms with the plant showing poor vigor; 90%- moribund or dying plant

Monocot

EC₀₅/IC₀₅: N/A 95% C.I.:

EC₂₅/IC₂₅: N/A 95% C.I.:

EC₅₀/IC₅₀: N/A 95% C.I.:

NOAEC: N/A

Slope: N/A

Std err: N/A

Most sensitive monocot: None

Most sensitive parameter: None

Dicot

EC₀₅/IC₀₅: 0.000016 lbs ai/A (0.018 g a.i./ha) 95% C.I.: 0.0000022 – 0.00011 (0.0025 – 0.12 g a.i./ha)

EC₂₅/IC₂₅: 0.00017 lbs ai/A (0.19 g a.i./ha) 95% C.I.: 5.5E⁻⁰⁵-0.00053lbs ai/A (0.062 – 0.59 g a.i./ha)

EC₅₀/IC₅₀: 0.00090 lbs ai/A (1.0 g a.i./ha) 95% C.I.: 0.00046-0.0017 lbs ai/A (0.52 – 1.9 g a.i./ha)

NOAEC: <0.00012 lbs ai/A (<0.13 g a.i./ha)

Slope: 0.935

Std err: 0.176

Most sensitive dicot: Cucumber

Most sensitive parameter: Dry Weight

D. STUDY DEFICIENCIES:

A NOAEC could not be determined for the most sensitive endpoint, cucumber dry weight. Inhibition in biomass at the lowest treatment level was 18%. According to a memo issued by US EPA entitled, "Closure on Nontarget Plant Phytotoxicity Policy Issues" on October 1994, if the lowest test level and the NOAEC are >EC₁₀, but <EC₂₅, the study may be classified as **SUPPLEMENTAL**.

E. REVIEWERS' COMMENTS:

The reviewers' conclusions were identical to the study authors', in that cucumber dry weight was the most sensitive endpoint. The reviewers' toxicity values were slightly lower than the study authors', presumably because they were based on the mean-measured application rates, whereas the study authors' results are based on the nominal application rates. Therefore, the reviewer's results are reported in the Executive Summary and Conclusions sections of this DER.

Raw data were not provided for cucumber plant height and oilseed rape plant height. The page numbering in the relevant portion of the appendix of the original report (Table A.1.4) appears to have been changed at some

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

point, and there may be two pages of raw data missing as a result (i.e., gap between pages 57 and 60 of the 77 pages total). As such, the reviewer was unable to analyze these species' endpoints. Therefore, in the determination of most sensitive dicot species, these two species' endpoints were not taken into consideration. These values were also not included in the determination of the most sensitive parameter for each species, which are reported in Table 1 of this DER. The study author-reported EC₂₅ values for plant height in cucumber and oilseed rape were approximately twice those of the biomass endpoint, which was considered the most sensitive parameter for effects on both of these dicots. A clarification could be requested from the registrant for the missing data, but it is not expected to change the final assessment for the most sensitive dicot endpoint.

The reviewer was unable to determine the EC₀₅ (and 95% C.I.) for oat and onion biomass and plant height. However, reliable NOAEC values were determined and the reviewer does not feel that the lack of EC₀₅ values is detrimental to the acceptability of the study.

Cucumber exhibited reductions of $\geq 18\%$ in biomass at all treatment levels. Therefore, a NOAEC value could not be determined for this species and endpoint. According to a memo issued by US EPA entitled, "Closure on Nontarget Plant Phytotoxicity Policy Issues" on October 1994, if the lowest test level and the NOAEC are $>EC_{10}$, but $<EC_{25}$, the study may be classified as **SUPPLEMENTAL**. However, the lack of a definitive NOAEC will not adversely affect the risk assessment by the PMRA, as a verifiable EC₂₅ endpoint was available (which is the endpoint used in the Canadian risk assessment to compare effects against expected environmental concentrations).

Sunflower exhibited percent reductions in dry weight of 7, 8, -1, 80, 83 and 64% and reductions in plant height of 5, 10, 11, 65, 64 and 61% at the mean-measured 0.00012, 0.00023, 0.00047, 0.00094, 0.0019 and 0.0037 lbs ai/A treatment levels, respectively, relative to the negative control. The reviewer's analysis yielded NOAEC values of 0.00047 lbs ai/A for both dry weight and plant height; however, the probit analysis yielded EC₂₅ values of 0.00037 lbs ai/A for both dry weight and plant height. The reviewer feels that this can be attributed to non-linear response to sunflower dry weight to exposure of the test material.

The survival NOAEC values for oilseed rape, soybean, sugar beet, sunflower and tomato were all determined visually. Because the data sets did not meet the assumptions of ANOVA, the analyses were conducted using the non-parametric Kruskal-Wallis test. This test is less sensitive than some of the parametric multiple comparison tests (Dunnnett's and Bonferroni's) and did not detect reductions that the reviewer felt were significant. Oilseed rape, sugar beet and sunflower survival was reduced 35, 25 and 45%, respectively, at the mean-measured 0.00094 lbs ai/A treatment level and the reviewer's analysis did not detect a significant difference at this level; therefore, the reviewer visually determined the NOAEC value for oilseed rape, sugar beet and sunflower survival to be 0.00047 lbs ai/A. The reviewer's analysis for soybean survival did not detect a significant difference at any of the treatment levels, despite the 31% reduction at the highest treatment level (0.0037 lbs ai/A). The reviewer felt that this was a significant reduction and therefore visually determined the NOAEC value for soybean survival to be the next lowest treatment level, mean-measured 0.0019 lbs ai/A. As a reduction in soybean survival was only observed at the highest treatment level, probit analysis was unable to generate EC_x values because only two distinct isotone means were exhibited, where three or more are necessary. The reviewer's analysis for tomato survival did not detect a significant difference at any of the treatment levels, despite the 33% reduction at the highest treatment level (0.0019 lbs ai/A). The reviewer felt that this was a significant reduction and therefore visually determined the NOAEC value for soybean survival to be the next lowest treatment level, mean-measured 0.00094 lbs ai/A. As a reduction in soybean survival was only observed at the highest treatment level, probit analysis was unable to generate EC_x values because only two distinct isotone means were exhibited, where three or more are necessary.

Species and endpoint where reliable EC₂₅ values were not determined by the reviewer's analysis could not be taken into consideration when determining the most sensitive dicot species or when determining the most sensitive endpoint for each species, which is reported in Table 1 of this DER. Reliable EC₂₅ values were not generated for cucumber plant height, oilseed rape plant height, soybean survival and tomato survival.

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

All species were tested under the same environmental conditions instead of testing cold-preferring species separately from warm-preferring species. The less-than-optimal environmental conditions could have had a synergistic effect with the test material, potentially confounding the observed results which are attributed entirely to the exposure of the test material.

Mean-measured application rates for corn and oat were 0 (negative control), 0.0019, 0.0037, 0.0075, 0.015 and 0.030 lbs ai/A (or, 0, 2.1, 4.1, 8.4, 16.8 and 33.6 g a.i./ha). Mean-measured application rates for onion and ryegrass were 0 (negative control), 0.00094, 0.0019, 0.0037, 0.0075, 0.015 and 0.030 lbs ai/A (or, 0, 1.1, 2.1, 4.1, 8.4, 16.8 and 33.6 g a.i./ha). Mean-measured application rates for cucumber, soybean, sugar beet and sunflower were 0 (negative control), 0.00012, 0.00023, 0.00047, 0.00094, 0.0019 and 0.0037 lbs ai/A (or, 0, 0.13, 0.26, 0.53, 1.1, 2.1 and 4.1 g a.i./ha). Mean-measured application rates for oilseed rape and tomato were 0 (negative control), 0.000063, 0.00012, 0.00023, 0.00047, 0.00094 and 0.0019 lbs ai/A (or, 0, 0.071, 0.13, 0.26, 0.53, 1.1 and 2.1 g a.i./ha).

The mean-measured application rates were determined by the reviewer based on the mean recoveries of the ten stock solutions representative of the ten application rates. The reviewer determined the mean recovery for each stock solution and multiplied this value by the nominal application rate to derive the mean-measured application rate.

No monocot species exhibited reductions of $\geq 25\%$ in dry weight, plant height or survival, relative to the negative control. However, non-significant reductions of $\geq 5\%$ were observed although EC_{05} values could not be determined. Therefore, in Table 1 (Summary of Most Sensitive Parameters by Species) the reviewer reported which endpoint(s) for each monocot exhibited non-significant reductions of $\geq 5\%$, represented by "ND" in the EC_{05} column.

The test material, AE 0317309 03 EC23 A8, was a formulation containing the active ingredients AE 0317309 (pyrasulfotole, purity of 3.45% w/w), AE F107892 (mefenpyr-diethyl, purity of 0.85% w/w) and AE F025943 (bromoxynil, purity of 18.94% w/w). The reviewer corrected all nominal application rates for the purity of AE 0317309 and converted these rates into lbs ai/A.

The dates of experimental work for the definitive vegetative vigor test were January 25 to February 25, 2005

Conversion of mean measured treatment rates (lbs a.i./A to g a.i./ha):

lbs ai/A	g a.i./ha
0.000063	0.071
0.00012	0.13
0.00023	0.26
0.00047	0.53
0.00094	1.1
0.0019	2.1
0.0037	4.1
0.0075	8.4
0.015	16.8
0.030	33.6

F. CONCLUSIONS:

This study is considered scientifically sound and is classified as **SUPPLEMENTAL** to the US EPA and **ACCEPTABLE** to the PMRA. No monocot species exhibited reductions of $\geq 25\%$ for any endpoint; therefore,

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

the reviewer could not identify a most sensitive monocot. The most sensitive dicot species, based on dry weight, was cucumber with an EC_{25} of 0.00017 lbs ai/A (0.19 g a.i./ha) and a NOAEC of <0.00012 lbs ai/A (<0.13 g a.i./ha). There was considerable inhibition at all treatment levels, including 18% at the lowest level.

Most sensitive monocot and EC_{25} : N/A

Most sensitive dicot and EC_{25} : Cucumber (Dry Weight), 0.00017 lbs ai/A (0.19 g a.i./ha)

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

III. REFERENCES:

BBA (Mai 2000): EPPO Standard PP 1/135 (2), Phytotoxicity Assessment.

BBCH-Monograph. Growth stages of Mono- and Dicotyledonous Plants, Federal Biological Research Centre for Agriculture and Forestry, 1997.

Chemikaliengesetz der Bundesrepublik Deutschland (ChemG), Anhang 1. in der Fassung der Bekanntmachung vom 20.03.2002 (BGBl. I S. 2090).

Holst, R.W. and Ellwanger, T.C. 1982. Pesticide Assessment Guidelines, Sub-division J, Hazard Evaluation: Non Target Plants, PB83-153940; EPA540/9-82-020; Series 123; Tier 2 of Non-target Area Testing; §123-1, US EPA, Washington, DC.

Norberg-King, T. 1993. National Effluent Toxicity Assessment Center Technical Report 03-93. A linear interpolation method for sublethal toxicity: The inhibition concentration (ICp) approach. Version 2.0. Environmental Protection Agency, Environmental Research Laboratory – Duluth, MN 55804.

OECD (Draft Document July 2000): Guideline for the testing of chemicals, Proposal for updating Guideline 208 "Terrestrial (Non-Target) Plant Test: 208A: Seedling Emergence and Seedling Growth Test. 208B: Vegetative Vigor Test."

THE OECD PRINCIPLES OF GOOD LABORATORY PRACTICE, adopted by Council on 26th November 1997 [C(97)186/Final]. Environmental Directorate, Organization for Economic Co-operation and Development, Paris 1998.

Ratte, M. ToxRat Professional 2.09: ToxRat Solutions GmbH, Naheweg 15, 52477 Alsdorf.

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

APPENDIX I. OUTPUT OF REVIEWER'S STATISTICAL VERIFICATION:

Corn dry weight (g), lbs ai/A; Day 21

File: 1937cw Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	1.055	0.211	0.902
Within (Error)	42	9.819	0.234	
Total	47	10.874		

Critical F value = 2.45 (0.05,5,40)

Since F < Critical F FAIL TO REJECT Ho:All groups equal

Corn dry weight (g), lbs ai/A; Day 21

File: 1937cw Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 1 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	3.328	3.328		
2	0.0019	3.114	3.114	0.882	
3	0.0037	3.330	3.330	-0.008	
4	0.0075	3.262	3.262	0.274	
5	0.015	2.903	2.903	1.757	
6	0.030	3.179	3.179	0.615	

Dunnett table value = 2.31 (1 Tailed Value, P=0.05, df=40,5)

Corn dry weight (g), lbs ai/A; Day 21

File: 1937cw Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 2 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	8			
2	0.0019	8	0.559	16.8	0.213
3	0.0037	8	0.559	16.8	-0.002
4	0.0075	8	0.559	16.8	0.066
5	0.015	8	0.559	16.8	0.425
6	0.030	8	0.559	16.8	0.149

Corn dry weight (g), lbs ai/A; Day 21

File: 1937cw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model). TABLE 1 OF 2

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	8	3.328	3.328	3.328
2	0.0019	8	3.114	3.114	3.235
3	0.0037	8	3.330	3.330	3.235
4	0.0075	8	3.262	3.262	3.235
5	0.015	8	2.903	2.903	3.041
6	0.030	8	3.179	3.179	3.041

Corn dry weight (g), lbs ai/A; Day 21

File: 1937cw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	3.328				
0.0019	3.235	0.383		1.68	k= 1, v=42
0.0037	3.235	0.383		1.76	k= 2, v=42
0.0075	3.235	0.383		1.79	k= 3, v=42
0.015	3.041	1.187		1.80	k= 4, v=42
0.030	3.041	1.187		1.80	k= 5, v=42

s = 0.484

Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.0077	1.6E-06	38.	1.8	0.00021
EC10	0.12	7.3E-06	2.1E+03	2.1	5.9E-05
EC25	13.	6.0E-11	2.7E+12	5.6	4.7E-12
EC50	2.2E+03	1.9E-17	2.6E+23	10.	8.6E-21

Slope = 0.301 Std.Err. = 0.597

Goodness of fit: p = 0.35 based on DF= 3.0 42.

1937CW : Corn dry weight (g), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	8.00	3.33	3.33	0.000508	100.	0.00
0.00190	8.00	3.11	3.21	-0.101	96.6	3.37
0.00370	8.00	3.33	3.19	0.138	95.9	4.08
0.00750	8.00	3.26	3.16	0.0993	95.0	4.96
0.0150	8.00	2.90	3.13	-0.226	94.0	5.96
0.0300	8.00	3.18	3.09	0.0885	92.9	7.12

!!!Warning: EC10 not bracketed by doses evaluated.

!!!Warning: EC25 not bracketed by doses evaluated.

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

!!!Warning: EC50 not bracketed by doses evaluated.

Oat dry weight (g), lbs ai/A; Day 21
File: 1937ow Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	0.784	0.157	2.804
Within (Error)	42	2.369	0.056	
Total	47	3.153		

Critical F value = 2.45 (0.05,5,40)
Since F > Critical F REJECT Ho:All groups equal

Oat dry weight (g), lbs ai/A; Day 21
File: 1937ow Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	1.267	1.267		
2	0.0019	1.337	1.337	-0.587	
3	0.0037	1.342	1.342	-0.632	
4	0.0075	1.305	1.305	-0.315	
5	0.015	1.421	1.421	-1.298	
6	0.030	1.015	1.015	2.134	

Dunnett table value = 2.31 (1 Tailed Value, P=0.05, df=40,5)

Oat dry weight (g), lbs ai/A; Day 21
File: 1937ow Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	8			
2	0.0019	8	0.273	21.6	-0.070
3	0.0037	8	0.273	21.6	-0.075
4	0.0075	8	0.273	21.6	-0.037
5	0.015	8	0.273	21.6	-0.154
6	0.030	8	0.273	21.6	0.253

Oat dry weight (g), lbs ai/A; Day 21
File: 1937ow Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	8	1.267	1.267	1.335
2	0.0019	8	1.337	1.337	1.335
3	0.0037	8	1.342	1.342	1.335
4	0.0075	8	1.305	1.305	1.335
5	0.015	8	1.421	1.421	1.335
6	0.030	8	1.015	1.015	1.015

Oat dry weight (g), lbs ai/A; Day 21
File: 1937ow Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)			TABLE 2 OF 2		
IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	1.335				
0.0019	1.335	0.564		1.68	k= 1, v=42
0.0037	1.335	0.564		1.76	k= 2, v=42
0.0075	1.335	0.564		1.79	k= 3, v=42
0.015	1.335	0.564		1.80	k= 4, v=42
0.030	1.015	2.126	*	1.80	k= 5, v=42

s = 0.237

Note: df used for table values are approximate when v > 20.

Oat plant height (cm), lbs ai/A; Day 21
File: 1937ol Transform: NO TRANSFORMATION

ANOVA TABLE				
SOURCE	DF	SS	MS	F
Between	5	380.514	76.103	2.889
Within (Error)	42	1106.425	26.343	
Total	47	1486.939		

Critical F value = 2.45 (0.05,5,40)

Since F > Critical F REJECT Ho:All groups equal

Oat plant height (cm), lbs ai/A; Day 21
File: 1937ol Transform: NO TRANSFORMATION

DUNNETTS TEST		TABLE 1 OF 2		Ho:Control<Treatment	
GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	79.200	79.200		
2	0.0019	81.700	81.700	-0.974	
3	0.0037	81.325	81.325	-0.828	

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

4	0.0075	82.275	82.275	-1.198
5	0.015	83.400	83.400	-1.637
6	0.030	74.825	74.825	1.705

Dunnett table value = 2.31 (1 Tailed Value, P=0.05, df=40,5)

Oat plant height (cm), lbs ai/A; Day 21

File: 193701 Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	8			
2	0.0019	8	5.928	7.5	-2.500
3	0.0037	8	5.928	7.5	-2.125
4	0.0075	8	5.928	7.5	-3.075
5	0.015	8	5.928	7.5	-4.200
6	0.030	8	5.928	7.5	4.375

Oat plant height (cm), lbs ai/A; Day 21

File: 193701 Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	8	79.200	79.200	81.580
2	0.0019	8	81.700	81.700	81.580
3	0.0037	8	81.325	81.325	81.580
4	0.0075	8	82.275	82.275	81.580
5	0.015	8	83.400	83.400	81.580
6	0.030	8	74.825	74.825	74.825

Oat plant height (cm), lbs ai/A; Day 21

File: 193701 Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	81.580				
0.0019	81.580	0.927		1.68	k= 1, v=42
0.0037	81.580	0.927		1.76	k= 2, v=42
0.0075	81.580	0.927		1.79	k= 3, v=42
0.015	81.580	0.927		1.80	k= 4, v=42
0.030	74.825	1.705		1.80	k= 5, v=42

s = 5.133

Note: df used for table values are approximate when v > 20.

Onion dry weight (g), lbs ai/A; Day 21

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

File: 1937nw

Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	0.018	0.003	3.000
Within (Error)	49	0.061	0.001	
Total	55	0.079		

Critical F value = 2.34 (0.05,6,40)

Since F > Critical F REJECT Ho:All groups equal

Onion dry weight (g), lbs ai/A; Day 21

File: 1937nw

Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 1 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	0.125	0.125		
2	0.00094	0.134	0.134	-0.585	
3	0.0019	0.135	0.135	-0.656	
4	0.0037	0.101	0.101	1.486	
5	0.0075	0.120	0.120	0.316	
6	0.015	0.162	0.162	-2.340	
7	0.030	0.112	0.112	0.822	

Dunnett table value = 2.37 (1 Tailed Value, P=0.05, df=40,6)

Onion dry weight (g), lbs ai/A; Day 21

File: 1937nw

Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 2 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	8			
2	0.00094	8	0.037	30.1	-0.009
3	0.0019	8	0.037	30.1	-0.010
4	0.0037	8	0.037	30.1	0.024
5	0.0075	8	0.037	30.1	0.005
6	0.015	8	0.037	30.1	-0.037
7	0.030	8	0.037	30.1	0.013

Onion dry weight (g), lbs ai/A; Day 21

File: 1937nw

Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)

TABLE 1 OF 2

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	8	0.125	0.125	0.131
2	0.00094	8	0.134	0.134	0.131
3	0.0019	8	0.135	0.135	0.131
4	0.0037	8	0.101	0.101	0.127
5	0.0075	8	0.120	0.120	0.127
6	0.015	8	0.162	0.162	0.127
7	0.030	8	0.112	0.112	0.112

Onion dry weight (g), lbs ai/A; Day 21

File: 1937nw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)

TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	0.131				
0.00094	0.131	0.372		1.68	k= 1, v=49
0.0019	0.131	0.372		1.76	k= 2, v=49
0.0037	0.127	0.161		1.79	k= 3, v=49
0.0075	0.127	0.161		1.80	k= 4, v=49
0.015	0.127	0.161		1.80	k= 5, v=49
0.030	0.112	0.738		1.81	k= 6, v=49

s = 0.035

Note: df used for table values are approximate when v > 20.

Onion plant height (cm), lbs ai/A; Day 21

File: 1937nl Transform: NO TRANSFORM

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	139.032	23.172	2.070
Within (Error)	49	548.607	11.196	
Total	55	687.639		

Critical F value = 2.34 (0.05,6,40)

Since F < Critical F FAIL TO REJECT Ho:All groups equal

Onion plant height (cm), lbs ai/A; Day 21

File: 1937nl Transform: NO TRANSFORM

DUNNETTS TEST - TABLE 1 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	26.456	26.456		
2	0.00094	27.200	27.200	-0.445	

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

3	0.0019	26.350	26.350	0.064
4	0.0037	24.975	24.975	0.885
5	0.0075	24.225	24.225	1.334
6	0.015	27.825	27.825	-0.818
7	0.030	23.069	23.069	2.025

Dunnett table value = 2.37 (1 Tailed Value, P=0.05, df=40,6)

Onion plant height (cm), lbs ai/A; Day 21
File: 1937nl Transform: NO TRANSFORM

DUNNETTS TEST		TABLE 2 OF 2		Ho:Control<Treatment		
GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL	
1	neg control	8				
2	0.00094	8	3.965	15.0		-0.744
3	0.0019	8	3.965	15.0		0.106
4	0.0037	8	3.965	15.0		1.481
5	0.0075	8	3.965	15.0		2.231
6	0.015	8	3.965	15.0		-1.369
7	0.030	8	3.965	15.0		3.388

Onion plant height (cm), lbs ai/A; Day 21
File: 1937nl Transform: NO TRANSFORM

WILLIAMS TEST (Isotonic regression model)		TABLE 1 OF 2			
GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	8	26.456	26.456	26.828
2	0.00094	8	27.200	27.200	26.828
3	0.0019	8	26.350	26.350	26.350
4	0.0037	8	24.975	24.975	25.675
5	0.0075	8	24.225	24.225	25.675
6	0.015	8	27.825	27.825	25.675
7	0.030	8	23.069	23.069	23.069

Onion plant height (cm), lbs ai/A; Day 21
File: 1937nl Transform: NO TRANSFORM

WILLIAMS TEST (Isotonic regression model)		TABLE 2 OF 2			
IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	26.828				
0.00094	26.828	0.222		1.68	k= 1, v=49
0.0019	26.350	0.064		1.76	k= 2, v=49
0.0037	25.675	0.467		1.79	k= 3, v=49
0.0075	25.675	0.467		1.80	k= 4, v=49
0.015	25.675	0.467		1.80	k= 5, v=49
0.030	23.069	2.025	*	1.81	k= 6, v=49

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

s = 3.346

Note: df used for table values are approximate when v > 20.

Ryegrass dry weight (g), lbs ai/A; Day 21

File: 1937gw Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	0.212	0.035	3.500
Within (Error)	49	0.494	0.010	
Total	55	0.706		

Critical F value = 2.34 (0.05,6,40)

Since F > Critical F REJECT Ho:All groups equal

Ryegrass dry weight (g), lbs ai/A; Day 21

File: 1937gw Transform: NO TRANSFORMATION

DUNNETTS TEST

TABLE 1 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	0.657	0.657		
2	0.00094	0.614	0.614	0.860	
3	0.0019	0.680	0.680	-0.462	
4	0.0037	0.732	0.732	-1.495	
5	0.0075	0.601	0.601	1.120	
6	0.015	0.625	0.625	0.640	
7	0.030	0.521	0.521	2.720	*

Dunnett table value = 2.37 (1 Tailed Value, P=0.05, df=40,6)

Ryegrass dry weight (g), lbs ai/A; Day 21

File: 1937gw Transform: NO TRANSFORMATION

DUNNETTS TEST

TABLE 2 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	8			
2	0.00094	8	0.118	18.0	0.043
3	0.0019	8	0.118	18.0	-0.023
4	0.0037	8	0.118	18.0	-0.075
5	0.0075	8	0.118	18.0	0.056
6	0.015	8	0.118	18.0	0.032
7	0.030	8	0.118	18.0	0.136

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Ryegrass dry weight (g), lbs ai/A; Day 21

File: 1937gw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)

TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	8	0.657	0.657	0.671
2	0.00094	8	0.614	0.614	0.671
3	0.0019	8	0.680	0.680	0.671
4	0.0037	8	0.732	0.732	0.671
5	0.0075	8	0.601	0.601	0.613
6	0.015	8	0.625	0.625	0.613
7	0.030	8	0.521	0.521	0.521

Ryegrass dry weight (g), lbs ai/A; Day 21

File: 1937gw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)

TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	0.671				
0.00094	0.671	0.273		1.68	k= 1, v=49
0.0019	0.671	0.273		1.76	k= 2, v=49
0.0037	0.671	0.273		1.79	k= 3, v=49
0.0075	0.613	0.877		1.80	k= 4, v=49
0.015	0.613	0.877		1.80	k= 5, v=49
0.030	0.521	2.709	*	1.81	k= 6, v=49

s = 0.100

Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds Lower Upper	Std.Err.	Lower Bound /Estimate
EC5	0.012	0.0035 0.039	0.26	0.30
EC10	0.017	0.0083 0.037	0.16	0.48
EC25	0.035	0.021 0.056	0.11	0.62
EC50	0.074	0.021 0.27	0.28	0.28

Slope = 2.03 Std.Err. = 1.27

Goodness of fit: p = 0.11 based on DF= 4.0 49.

1937GW : Ryegrass dry weight (g), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	8.00	0.657	0.663	-0.00572	100.	0.00
0.000940	8.00	0.614	0.663	-0.0487	100.	0.00564
0.00190	8.00	0.680	0.662	0.0178	99.9	0.0598
0.00370	8.00	0.732	0.660	0.0717	99.6	0.401

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

0.00750	8.00	0.601	0.649	-0.0476	97.9	2.13
0.0150	8.00	0.625	0.611	0.0143	92.1	7.85
0.0300	8.00	0.521	0.523	-0.00184	78.9	21.1

!!!Warning: EC25 not bracketed by doses evaluated.

!!!Warning: EC50 not bracketed by doses evaluated.

Ryegrass plant height (cm), lbs ai/A; Day 21
File: 1937g1 Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	223.219	37.203	3.596
Within (Error)	49	506.935	10.346	
Total	55	730.154		

Critical F value = 2.34 (0.05,6,40)
Since F > Critical F REJECT Ho:All groups equal

Ryegrass plant height (cm), lbs ai/A; Day 21
File: 1937g1 Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	43.275	43.275		
2	0.00094	43.100	43.100	0.109	
3	0.0019	44.725	44.725	-0.902	
4	0.0037	43.075	43.075	0.124	
5	0.0075	42.075	42.075	0.746	
6	0.015	43.075	43.075	0.124	
7	0.030	37.900	37.900	3.342	*

Dunnett table value = 2.37 (1 Tailed Value, P=0.05, df=40,6)

Ryegrass plant height (cm), lbs ai/A; Day 21
File: 1937g1 Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	8			
2	0.00094	8	3.812	8.8	0.175
3	0.0019	8	3.812	8.8	-1.450
4	0.0037	8	3.812	8.8	0.200
5	0.0075	8	3.812	8.8	1.200
6	0.015	8	3.812	8.8	0.200
7	0.030	8	3.812	8.8	5.375

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Ryegrass plant height (cm), lbs ai/A; Day 21
File: 1937gl Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	8	43.275	43.275	43.700
2	0.00094	8	43.100	43.100	43.700
3	0.0019	8	44.725	44.725	43.700
4	0.0037	8	43.075	43.075	43.075
5	0.0075	8	42.075	42.075	42.575
6	0.015	8	43.075	43.075	42.575
7	0.030	8	37.900	37.900	37.900

Ryegrass plant height (cm), lbs ai/A; Day 21
File: 1937gl Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	43.700				
0.00094	43.700	0.264		1.68	k= 1, v=49
0.0019	43.700	0.264		1.76	k= 2, v=49
0.0037	43.075	0.124		1.79	k= 3, v=49
0.0075	42.575	0.435		1.80	k= 4, v=49
0.015	42.575	0.435		1.80	k= 5, v=49
0.030	37.900	3.342	*	1.81	k= 6, v=49

s = 3.216

Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound
		Lower	Upper		/Estimate
EC5	0.024	0.012	0.048	0.15	0.49
EC10	0.028	0.023	0.035	0.049	0.80
EC25	0.038	0.019	0.074	0.15	0.51
EC50	0.052	0.011	0.26	0.35	0.20

Slope = 4.78 Std.Err. = 6.91

Goodness of fit: p = 0.61 based on DF= 4.0 49.

1937GL : Ryegrass plant height (cm), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
------	--------	--------------	---------------	----------------	-------------------	---------

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

0.00	8.00	43.3	43.3	0.0201	100.	0.00
0.000940	8.00	43.1	43.3	-0.155	100.	1.64e-14
0.00190	8.00	44.7	43.3	1.47	100.	2.89e-10
0.00370	8.00	43.1	43.3	-0.180	100.	1.88e-06
0.00750	8.00	42.1	43.3	-1.18	100.	0.00274
0.0150	8.00	43.1	43.1	0.0245	99.5	0.472
0.0300	8.00	37.9	37.9	-0.000822	87.6	12.4

!!!Warning: EC25 not bracketed by doses evaluated.

!!!Warning: EC50 not bracketed by doses evaluated.

Cucumber dry weight (g), lbs ai/A; Day 21

File: 1937uw Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	31.727	5.288	17.058
Within (Error)	62	19.248	0.310	
Total	68	50.975		

Critical F value = 2.25 (0.05,6,60)

Since F > Critical F REJECT Ho:All groups equal

Cucumber dry weight (g), lbs ai/A; Day 21

File: 1937uw Transform: NO TRANSFORMATION

BONFERRONI T-TEST

TABLE 1 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	2.841	2.841		
2	0.00012	2.334	2.334	2.037	
3	0.00023	2.220	2.220	2.496	*
4	0.00047	1.628	1.628	4.873	*
5	0.00094	1.137	1.137	6.845	*
6	0.0019	1.334	1.334	6.052	*
7	0.0037	0.773	0.773	8.083	*

Bonferroni T table value = 2.46 (1 Tailed Value, P=0.05, df=60,6)

Cucumber dry weight (g), lbs ai/A; Day 21

File: 1937uw Transform: NO TRANSFORMATION

BONFERRONI T-TEST

TABLE 2 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	10			
2	0.00012	10	0.613	21.6	0.507
3	0.00023	10	0.613	21.6	0.622

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

4	0.00047	10	0.613	21.6	1.213
5	0.00094	10	0.613	21.6	1.704
6	0.0019	10	0.613	21.6	1.507
7	0.0037	9	0.630	22.2	2.068

Cucumber dry weight (g), lbs ai/A; Day 21
File: 1937uw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	10	2.841	2.841	2.841
2	0.00012	10	2.334	2.334	2.334
3	0.00023	10	2.220	2.220	2.220
4	0.00047	10	1.628	1.628	1.628
5	0.00094	10	1.137	1.137	1.236
6	0.0019	10	1.334	1.334	1.236
7	0.0037	9	0.773	0.773	0.773

Cucumber dry weight (g), lbs ai/A; Day 21
File: 1937uw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	2.841				
0.00012	2.334	2.035	*	1.67	k= 1, v=62
0.00023	2.220	2.494	*	1.75	k= 2, v=62
0.00047	1.628	4.869	*	1.77	k= 3, v=62
0.00094	1.236	6.444	*	1.78	k= 4, v=62
0.0019	1.236	6.444	*	1.79	k= 5, v=62
0.0037	0.773	8.077	*	1.79	k= 6, v=62

s = 0.557

Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound
		Lower	Upper		/Estimate
EC5	1.6E-05	2.2E-06	0.00011	0.43	0.14
EC10	3.8E-05	7.5E-06	0.00020	0.36	0.19
EC25	0.00017	5.5E-05	0.00053	0.24	0.32
EC50	0.00090	0.00046	0.0017	0.14	0.51

Slope = 0.935 Std.Err. = 0.176

Goodness of fit: p = 0.17 based on DF= 4.0 62.

1937UW : Cucumber dry weight (g), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	10.0	2.84	2.88	-0.0370	100.	0.00
0.000120	10.0	2.33	2.28	0.0508	79.3	20.7
0.000230	10.0	2.22	2.04	0.176	71.0	29.0
0.000470	10.0	1.63	1.74	-0.110	60.4	39.6
0.000940	10.0	1.14	1.42	-0.282	49.3	50.7
0.00190	10.0	1.33	1.10	0.239	38.1	61.9
0.00370	9.00	0.773	0.814	-0.0407	28.3	71.7

!!!Warning: EC5 not bracketed by doses evaluated.

!!!Warning: EC10 not bracketed by doses evaluated.

Cucumber % survival, lbs ai/A; Day 21

File: 1937us Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	100.000	100.000	405.000
2	0.00012	100.000	100.000	405.000
3	0.00023	100.000	100.000	405.000
4	0.00047	100.000	100.000	405.000
5	0.00094	100.000	100.000	405.000
6	0.0019	97.500	97.500	373.500
7	0.0037	45.000	45.000	86.500

Calculated H Value = -74.961

Critical H Value Table = 12.590

Since Calc H < Crit H FAIL TO REJECT Ho: All groups are equal.

Cucumber % survival, lbs ai/A; Day 21

File: 1937us Transform: NO TRANSFORMATION

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP 0 0 0 0 0 0 0 7 6 3 4 5 1 2
7	0.0037	45.000	45.000	\
6	0.0019	97.500	97.500	* \
3	0.00023	100.000	100.000	* . \
4	0.00047	100.000	100.000	* . . \
5	0.00094	100.000	100.000	* . . . \
1	neg control	100.000	100.000	* \
2	0.00012	100.000	100.000	* \

* = significant difference (p=0.05)

. = no significant difference

Table q value (0.05,7) = 3.038

SE = 8.840

Estimates of EC%

Parameter	Estimate	95% Bounds Lower Upper	Std.Err.	Lower Bound /Estimate
-----------	----------	---------------------------	----------	--------------------------

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

EC5	0.0021	0.0012	0.0036	0.12	0.58
EC10	0.0024	0.0015	0.0036	0.094	0.65
EC25	0.0029	0.0022	0.0037	0.055	0.78
EC50	0.0036	0.0033	0.0038	0.016	0.93

Slope = 7.21 Std.Err. = 3.42

Goodness of fit: p = 1.0 based on DF= 4.0 63.

1937US : Cucumber % survival, lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	10.0	100.	100.	-0.000315	100.	0.00
0.000120	10.0	100.	100.	-0.000315	100.	2.84e-14
0.000230	10.0	100.	100.	-0.000315	100.	2.84e-14
0.000470	10.0	100.	100.	-0.000315	100.	1.22e-08
0.000940	10.0	100.	100.	0.00126	100.	0.00158
0.00190	10.0	97.5	97.5	-2.99e-06	97.5	2.50
0.00370	10.0	45.0	45.0	1.05e-07	45.0	55.0

Oilseed rape dry weight (g), lbs ai/A; Day 21

File: 1937dw Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	29.525	4.921	34.174
Within (Error)	44	6.336	0.144	
Total	50	35.861		

Critical F value = 2.34 (0.05,6,40)

Since F > Critical F REJECT Ho:All groups equal

Oilseed rape dry weight (g), lbs ai/A; Day 21

File: 1937dw Transform: NO TRANSFORMATION

BONFERRONI T-TEST

TABLE 1 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	2.712	2.712		
2	0.000063	2.336	2.336	1.982	
3	0.00012	2.329	2.329	2.019	
4	0.00023	2.369	2.369	1.804	
5	0.00047	2.298	2.298	2.179	
6	0.00094	0.709	0.709	10.556	*
7	0.0019	0.308	0.308	9.355	*

Bonferroni T table value = 2.50 (1 Tailed Value, P=0.05, df=40,6)

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Oilseed rape dry weight (g), lbs ai/A; Day 21
File: 1937dw Transform: NO TRANSFORMATION

BONFERRONI T-TEST		TABLE 2 OF 2		Ho:Control<Treatment	
GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	8			
2	0.000063	8	0.474	17.5	0.376
3	0.00012	8	0.474	17.5	0.383
4	0.00023	8	0.474	17.5	0.342
5	0.00047	8	0.474	17.5	0.413
6	0.00094	8	0.474	17.5	2.003
7	0.0019	3	0.642	23.7	2.403

Oilseed rape dry weight (g), lbs ai/A; Day 21
File: 1937dw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)			TABLE 1 OF 2		
GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	8	2.712	2.712	2.712
2	0.000063	8	2.336	2.336	2.344
3	0.00012	8	2.329	2.329	2.344
4	0.00023	8	2.369	2.369	2.344
5	0.00047	8	2.298	2.298	2.298
6	0.00094	8	0.709	0.709	0.709
7	0.0019	3	0.308	0.308	0.308

Oilseed rape dry weight (g), lbs ai/A; Day 21
File: 1937dw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)			TABLE 2 OF 2		
IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	2.712				
0.000063	2.344	1.935	*	1.68	k= 1, v=44
0.00012	2.344	1.935	*	1.76	k= 2, v=44
0.00023	2.344	1.935	*	1.79	k= 3, v=44
0.00047	2.298	2.179	*	1.80	k= 4, v=44
0.00094	0.709	10.556	*	1.80	k= 5, v=44
0.0019	0.308	9.355	*	1.81	k= 6, v=44

s = 0.379

Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds	Std.Err.	Lower Bound
		Lower Upper		/Estimate

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

EC5	0.00029	0.00018	0.00045	0.097	0.64
EC10	0.00035	0.00024	0.00052	0.082	0.69
EC25	0.00051	0.00039	0.00067	0.058	0.76
EC50	0.00077	0.00065	0.00091	0.037	0.84

Slope = 3.82 Std.Err. = 0.641

!!!Poor fit: p = 0.020 based on DF= 4.0 44.

1937DW : Oilseed rape dry weight (g), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	8.00	2.71	2.49	0.221	100.	0.00
6.30e-05	8.00	2.34	2.49	-0.155	100.	0.00168
0.000120	8.00	2.33	2.49	-0.160	99.9	0.104
0.000230	8.00	2.37	2.43	-0.0649	97.7	2.27
0.000470	8.00	2.30	1.97	0.324	79.3	20.7
0.000940	8.00	0.709	0.920	-0.211	36.9	63.1
0.00190	3.00	0.308	0.166	0.142	6.67	93.3

Oilseed rape % survival, lbs ai/A; Day 21

File: 1937ds Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	100.000	100.000	292.000
2	0.000063	100.000	100.000	292.000
3	0.00012	100.000	100.000	292.000
4	0.00023	100.000	100.000	292.000
5	0.00047	100.000	100.000	292.000
6	0.00094	65.000	65.000	97.000
7	0.0019	12.500	12.500	39.000

Calculated H Value = 36.588 Critical H Value Table = 12.590
Since Calc H > Crit H REJECT Ho: All groups are equal.

Oilseed rape % survival, lbs ai/A; Day 21

File: 1937ds Transform: NO TRANSFORMATION

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP 0 0 0 0 0 0 7 6 3 4 5 1 2
7	0.0019	12.500	12.500	\
6	0.00094	65.000	65.000	. \
3	0.00012	100.000	100.000	* . \
4	0.00023	100.000	100.000	* . . \
5	0.00047	100.000	100.000	* . . . \
1	neg control	100.000	100.000	* \
2	0.000063	100.000	100.000	* \

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

* = significant difference (p=0.05)
Table q value (0.05,7) = 3.038

. = no significant difference
SE = 8.183

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.00053	0.00040	0.00071	0.064	0.74
EC10	0.00063	0.00049	0.00081	0.055	0.78
EC25	0.00083	0.00068	0.0010	0.041	0.83
EC50	0.0011	0.00099	0.0013	0.027	0.88

Slope = 5.07 Std.Err. = 0.681

Goodness of fit: p = 1.0 based on DF= 4.0 49.

1937DS : Oilseed rape % survival, lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	8.00	100.	100.	-0.473	100.	0.00
6.30e-05	8.00	100.	100.	-0.473	100.	1.15e-08
0.000120	8.00	100.	100.	-0.473	100.	4.30e-05
0.000230	8.00	100.	100.	-0.449	100.	0.0242
0.000470	8.00	100.	97.7	2.30	97.2	2.76
0.000940	8.00	65.0	65.5	-0.526	65.2	34.8
0.00190	8.00	12.5	12.4	0.0894	12.4	87.6

Soybean dry weight (g), lbs ai/A; Day 21

File: 1937sw Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	1.485	1.485	499.000
2	0.00012	1.266	1.266	412.000
3	0.00023	1.300	1.300	436.000
4	0.00047	1.414	1.414	485.000
5	0.00094	0.873	0.873	219.000
6	0.0019	1.092	1.092	319.000
7	0.0037	0.169	0.169	45.000

Calculated H Value = 37.761 Critical H Value Table = 12.590
Since Calc H > Crit H REJECT Ho: All groups are equal.

Soybean dry weight (g), lbs ai/A; Day 21

File: 1937sw Transform: NO TRANSFORMATION

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

TRANSFORMED ORIGINAL 0 0 0 0 0 0 0

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

GROUP	IDENTIFICATION	MEAN	MEAN	7	5	6	2	3	4	1
7	0.0037	0.169	0.169	\						
5	0.00094	0.873	0.873	.	\					
6	0.0019	1.092	1.092	.	.	\				
2	0.00012	1.266	1.266	*	.	.	\			
3	0.00023	1.300	1.300	*	.	.	.	\		
4	0.00047	1.414	1.414	*	.	.	.	.	\	
1	neg control	1.485	1.485	*	*	.	.	.	.	\

* = significant difference (p=0.05)

Table q value (0.05,7) = 3.038

. = no significant difference

Unequal reps - multiple SE values

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.0016	0.0012	0.0021	0.062	0.75
EC10	0.0018	0.0014	0.0023	0.053	0.78
EC25	0.0021	0.0018	0.0026	0.040	0.83
EC50	0.0026	0.0023	0.0030	0.027	0.88

Slope = 7.49 Std.Err. = 1.33

!!!Poor fit: p < 0.001 based on DF= 4.00 62.0

1937SW : Soybean dry weight (g), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	10.0	1.48	1.27	0.216	100.	0.00
0.000120	10.0	1.27	1.27	-0.00272	100.	1.75e-14
0.000230	10.0	1.30	1.27	0.0314	100.	1.05e-13
0.000470	10.0	1.41	1.27	0.145	100.	1.06e-06
0.000940	10.0	0.873	1.27	-0.396	100.	0.0409
0.00190	10.0	1.09	1.08	0.00747	85.5	14.5
0.00370	9.00	0.169	0.169	-0.000591	13.3	86.7

Soybean plant height (cm), lbs ai/A; Day 21

File: 1937s1 Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	1111.152	185.192	22.510
Within (Error)	62	510.099	8.227	
Total	68	1621.251		

Critical F value = 2.25 (0.05,6,60)

Since F > Critical F REJECT Ho:All groups equal

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Soybean plant height (cm), lbs ai/A; Day 21

File: 1937s1 Transform: NO TRANSFORMATION

BONFERRONI T-TEST		TABLE 1 OF 2		Ho:Control<Treatment	
GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	27.100	27.100		
2	0.00012	26.075	26.075	0.799	
3	0.00023	27.800	27.800	-0.546	
4	0.00047	26.900	26.900	0.156	
5	0.00094	22.050	22.050	3.937	*
6	0.0019	24.600	24.600	1.949	
7	0.0037	15.111	15.111	9.097	*

Bonferroni T table value = 2.46 (1 Tailed Value, P=0.05, df=60,6)

Soybean plant height (cm), lbs ai/A; Day 21

File: 1937s1 Transform: NO TRANSFORMATION

BONFERRONI T-TEST		TABLE 2 OF 2		Ho:Control<Treatment	
GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	10			
2	0.00012	10	3.159	11.7	1.025
3	0.00023	10	3.159	11.7	-0.700
4	0.00047	10	3.159	11.7	0.200
5	0.00094	10	3.159	11.7	5.050
6	0.0019	10	3.159	11.7	2.500
7	0.0037	9	3.246	12.0	11.989

Soybean plant height (cm), lbs ai/A; Day 21

File: 1937s1 Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)				TABLE 1 OF 2	
GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	10	27.100	27.100	27.100
2	0.00012	10	26.075	26.075	26.938
3	0.00023	10	27.800	27.800	26.938
4	0.00047	10	26.900	26.900	26.900
5	0.00094	10	22.050	22.050	23.325
6	0.0019	10	24.600	24.600	23.325
7	0.0037	9	15.111	15.111	15.111

Soybean plant height (cm), lbs ai/A; Day 21

File: 1937s1 Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)		TABLE 2 OF 2	
---	--	--------------	--

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	27.100				
0.00012	26.938	0.127		1.67	k= 1, v=62
0.00023	26.938	0.127		1.75	k= 2, v=62
0.00047	26.900	0.156		1.77	k= 3, v=62
0.00094	23.325	2.943	*	1.78	k= 4, v=62
0.0019	23.325	2.943	*	1.79	k= 5, v=62
0.0037	15.111	9.097	*	1.79	k= 6, v=62

s = 2.868

Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds Lower Upper	Std.Err.	Lower Bound /Estimate
EC5	0.0017	0.0011 0.0024	0.083	0.68
EC10	0.0020	0.0015 0.0027	0.063	0.75
EC25	0.0029	0.0025 0.0033	0.032	0.86
EC50	0.0041	0.0037 0.0047	0.026	0.89

Slope = 4.15 Std.Err. = 1.00

!!!Poor fit: p < 0.001 based on DF= 4.00 62.0

1937SL : Soybean plant height (cm), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	10.0	27.1	26.1	0.995	100.	0.00
0.000120	10.0	26.1	26.1	-0.0301	100.	8.56e-09
0.000230	10.0	27.8	26.1	1.69	100.	9.30e-06
0.000470	10.0	26.9	26.1	0.796	100.	0.00434
0.000940	10.0	22.1	26.0	-3.96	99.6	0.373
0.00190	10.0	24.6	24.0	0.573	92.0	7.96
0.00370	9.00	15.1	15.2	-0.0789	58.2	41.8

!!!Warning: EC50 not bracketed by doses evaluated.

Soybean % survival, lbs ai/A; Day 21

File: 1937ss Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	100.000	100.000	248.000
2	0.00012	100.000	100.000	248.000
3	0.00023	100.000	100.000	248.000
4	0.00047	100.000	100.000	248.000
5	0.00094	100.000	100.000	248.000
6	0.0019	100.000	100.000	248.000
7	0.0037	68.750	68.750	108.000

Calculated H Value = 7.356

Critical H Value Table = 12.590

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Since Calc H < Crit H FAIL TO REJECT Ho:All groups are equal.

Soybean % survival, lbs ai/A; Day 21
File: 1937ss Transform: NO TRANSFORMATION

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP						
				0	0	0	0	0	0	0
7	0.0037	68.750	68.750	\						
2	0.00012	100.000	100.000	.	\					
3	0.00023	100.000	100.000	.	.	\				
4	0.00047	100.000	100.000	.	.	.	\			
5	0.00094	100.000	100.000	.	.	.	.	\		
6	0.0019	100.000	100.000	.	.	.	.	.	\	
1	neg control	100.000	100.000	.	.	.	.	.	.	\

* = significant difference (p=0.05) . = no significant difference
Table q value (0.05,7) = 3.038 SE = 8.119

Sugar beet dry weight (g), lbs ai/A; Day 21
File: 1937bw Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	7.185	1.197	17.100
Within (Error)	41	2.863	0.070	
Total	47	10.048		

Critical F value = 2.34 (0.05,6,40)
Since F > Critical F REJECT Ho:All groups equal

Sugar beet dry weight (g), lbs ai/A; Day 21
File: 1937bw Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	1.523	1.523		
2	0.00012	1.408	1.408	0.869	
3	0.00023	1.340	1.340	1.386	
4	0.00047	1.221	1.221	2.287	
5	0.00094	0.494	0.494	7.780	*
6	0.0019	0.673	0.673	5.246	*
7	0.0037	0.666	0.666	5.290	*

Bonferroni T table value = 2.50 (1 Tailed Value, P=0.05, df=40,6)

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Sugar beet dry weight (g), lbs ai/A; Day 21
File: 1937bw Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 2 OF 2		Ho:Control<Treatment			
GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	8			
2	0.00012	8	0.331	21.7	0.115
3	0.00023	8	0.331	21.7	0.183
4	0.00047	8	0.331	21.7	0.302
5	0.00094	8	0.331	21.7	1.029
6	0.0019	4	0.405	26.6	0.850
7	0.0037	4	0.405	26.6	0.857

Sugar beet dry weight (g), lbs ai/A; Day 21
File: 1937bw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2					
GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	8	1.523	1.523	1.523
2	0.00012	8	1.408	1.408	1.408
3	0.00023	8	1.340	1.340	1.340
4	0.00047	8	1.221	1.221	1.221
5	0.00094	8	0.494	0.494	0.582
6	0.0019	4	0.673	0.673	0.582
7	0.0037	4	0.666	0.666	0.582

Sugar beet dry weight (g), lbs ai/A; Day 21
File: 1937bw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2					
IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	1.523				
0.00012	1.408	0.870		1.68	k= 1, v=41
0.00023	1.340	1.388		1.76	k= 2, v=41
0.00047	1.221	2.289	*	1.79	k= 3, v=41
0.00094	0.582	7.124	*	1.80	k= 4, v=41
0.0019	0.582	5.817	*	1.80	k= 5, v=41
0.0037	0.582	5.817	*	1.81	k= 6, v=41

s = 0.264

Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound
		Lower	Upper		/Estimate

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

EC5	3.2E-05	4.0E-06	0.00026	0.45	0.12
EC10	7.2E-05	1.3E-05	0.00040	0.37	0.18
EC25	0.00027	8.5E-05	0.00086	0.25	0.31
EC50	0.0012	0.00059	0.0024	0.15	0.50

Slope = 1.05 Std.Err. = 0.255

!!!Poor fit: p < 0.001 based on DF= 4.00 41.0

1937BW : Sugar beet dry weight (g), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	8.00	1.52	1.59	-0.0687	100.	0.00
0.000120	8.00	1.41	1.36	0.0521	85.2	14.8
0.000230	8.00	1.34	1.23	0.110	77.2	22.8
0.000470	8.00	1.22	1.05	0.166	66.3	33.7
0.000940	8.00	0.494	0.861	-0.367	54.1	45.9
0.00190	4.00	0.673	0.658	0.0157	41.3	58.7
0.00370	4.00	0.666	0.477	0.189	30.0	70.0

!!!Warning: EC5 not bracketed by doses evaluated.

!!!Warning: EC10 not bracketed by doses evaluated.

Sugar beet plant height (cm), lbs ai/A; Day 21

File: 1937bl Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	539.478	89.913	25.052
Within (Error)	41	147.157	3.589	
Total	47	686.636		

Critical F value = 2.34 (0.05,6,40)

Since F > Critical F REJECT Ho:All groups equal

Sugar beet plant height (cm), lbs ai/A; Day 21

File: 1937bl Transform: NO TRANSFORMATION

BONFERRONI T-TEST

TABLE 1 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	19.750	19.750		
2	0.00012	19.075	19.075	0.713	
3	0.00023	19.800	19.800	-0.053	
4	0.00047	19.575	19.575	0.185	
5	0.00094	12.375	12.375	7.786	*
6	0.0019	13.042	13.042	5.782	*

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

7 0.0037 12.083 12.083 6.609 *

Bonferroni T table value = 2.50 (1 Tailed Value, P=0.05, df=40,6)

Sugar beet plant height (cm), lbs ai/A; Day 21
File: 1937b1 Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 2 OF 2			Ho:Control<Treatment		
GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	8			
2	0.00012	8	2.367	12.0	0.675
3	0.00023	8	2.367	12.0	-0.050
4	0.00047	8	2.367	12.0	0.175
5	0.00094	8	2.367	12.0	7.375
6	0.0019	4	2.899	14.7	6.708
7	0.0037	4	2.899	14.7	7.667

Sugar beet plant height (cm), lbs ai/A; Day 21
File: 1937b1 Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2					
GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	8	19.750	19.750	19.750
2	0.00012	8	19.075	19.075	19.483
3	0.00023	8	19.800	19.800	19.483
4	0.00047	8	19.575	19.575	19.483
5	0.00094	8	12.375	12.375	12.597
6	0.0019	4	13.042	13.042	12.597
7	0.0037	4	12.083	12.083	12.083

Sugar beet plant height (cm), lbs ai/A; Day 21
File: 1937b1 Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2					
IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	19.750				
0.00012	19.483	0.282		1.68	k= 1, v=41
0.00023	19.483	0.282		1.76	k= 2, v=41
0.00047	19.483	0.282		1.79	k= 3, v=41
0.00094	12.597	7.551	*	1.80	k= 4, v=41
0.0019	12.597	6.165	*	1.80	k= 5, v=41
0.0037	12.083	6.608	*	1.81	k= 6, v=41

s = 1.895

Note: df used for table values are approximate when v > 20.

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.00012	2.8E-05	0.00055	0.32	0.23
EC10	0.00027	8.6E-05	0.00086	0.25	0.32
EC25	0.0010	0.00052	0.0019	0.14	0.52
EC50	0.0043	0.0025	0.0072	0.11	0.60

Slope = 1.07 Std.Err. = 0.242

!!!Poor fit: p < 0.001 based on DF= 4.00 41.0

1937BL : Sugar beet plant height (cm), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	8.00	19.8	20.4	-0.641	100.	0.00
0.000120	8.00	19.1	19.4	-0.331	95.2	4.83
0.000230	8.00	19.8	18.6	1.18	91.3	8.71
0.000470	8.00	19.6	17.3	2.29	84.8	15.2
0.000940	8.00	12.4	15.5	-3.11	75.9	24.1
0.00190	4.00	13.0	13.2	-0.144	64.7	35.3
0.00370	4.00	12.1	10.7	1.35	52.6	47.4

!!!Warning: EC50 not bracketed by doses evaluated.

Sugar beet % survival, lbs ai/A; Day 21

File: 1937bs Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	100.000	100.000	312.000
2	0.00012	100.000	100.000	312.000
3	0.00023	100.000	100.000	312.000
4	0.00047	100.000	100.000	312.000
5	0.00094	75.000	75.000	204.000
6	0.0019	17.500	17.500	74.000
7	0.0037	15.000	15.000	70.000

Calculated H Value = -853.400 Critical H Value Table = 12.590

Since Calc H < Crit H FAIL TO REJECT Ho: All groups are equal.

Sugar beet % survival, lbs ai/A; Day 21

File: 1937bs Transform: NO TRANSFORMATION

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP							
				0	0	0	0	0	0	0	0
7	0.0037	15.000	15.000	7	6	5	4	1	2	3	

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

6	0.0019	17.500	17.500	. \
5	0.00094	75.000	75.000	. . \
4	0.00047	100.000	100.000	* * . \
1	neg control	100.000	100.000	* * . . \
2	0.00012	100.000	100.000	* * . . . \
3	0.00023	100.000	100.000	* * \

* = significant difference (p=0.05)
Table q value (0.05,7) = 3.038

. = no significant difference
SE = 8.649

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.00032	0.00015	0.00069	0.17	0.46
EC10	0.00043	0.00022	0.00084	0.14	0.52
EC25	0.00072	0.00044	0.0012	0.11	0.62
EC50	0.0013	0.00091	0.0017	0.068	0.73

Slope = 2.79 Std.Err. = 0.526

Goodness of fit: p = 0.082 based on DF= 4.0 49.

1937BS : Sugar beet % survival, lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	8.00	100.	104.	-3.62	100.	0.00
0.000120	8.00	100.	103.	-3.38	99.8	0.228
0.000230	8.00	100.	102.	-1.53	98.0	2.02
0.000470	8.00	100.	91.4	8.61	88.2	11.8
0.000940	8.00	75.0	65.9	9.14	63.6	36.4
0.00190	8.00	17.5	31.8	-14.3	30.7	69.3
0.00370	8.00	15.0	9.84	5.16	9.50	90.5

Sunflower dry weight (g), lbs ai/A; Day 21

File: 1937fw Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	1.423	1.423	374.500
2	0.00012	1.321	1.321	336.000
3	0.00023	1.309	1.309	300.500
4	0.00047	1.434	1.434	406.000
5	0.00094	0.289	0.289	71.000
6	0.0019	0.238	0.238	23.000
7	0.0037	0.513	0.513	29.000

Calculated H Value = 34.081 Critical H Value Table = 12.590
Since Calc H > Crit H REJECT Ho: All groups are equal.

Sunflower dry weight (g), lbs ai/A; Day 21

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

File: 1937fw

Transform: NO TRANSFORMATION

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP							
				0	0	0	0	0	0	0	0
6	0.0019	0.238	0.238	\							
5	0.00094	0.289	0.289	.	\						
7	0.0037	0.513	0.513	.	.	\					
3	0.00023	1.309	1.309	.	.	.	\				
2	0.00012	1.321	1.321	.	*	.	.	\			
1	neg control	1.423	1.423	*	*	.	.	.	\		
4	0.00047	1.434	1.434	*	*	.	.	.	.	\	

* = significant difference (p=0.05)

. = no significant difference

Table q value (0.05,7) = 3.038

Unequal reps - multiple SE values

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.00010	2.6E-05	0.00042	0.30	0.25
EC10	0.00017	5.1E-05	0.00054	0.25	0.31
EC25	0.00037	0.00016	0.00085	0.18	0.43
EC50	0.00089	0.00053	0.0015	0.11	0.59

Slope = 1.76 Std.Err. = 0.428

!!!Poor fit: p < 0.001 based on DF= 4.00 48.0

1937FW : Sunflower dry weight (g), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	10.0	1.42	1.48	-0.0586	100.	0.00
0.000120	10.0	1.32	1.39	-0.0668	93.7	6.31
0.000230	10.0	1.31	1.26	0.0512	84.9	15.1
0.000470	10.0	1.43	1.02	0.417	68.7	31.3
0.000940	8.00	0.289	0.715	-0.426	48.3	51.7
0.00190	4.00	0.238	0.416	-0.178	28.1	71.9
0.00370	3.00	0.513	0.205	0.308	13.8	86.2

!!!Warning: EC5 not bracketed by doses evaluated.

Sunflower plant height (cm), lbs ai/A; Day 21

File: 1937f1

Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	11.175	11.175	424.500
2	0.00012	10.600	10.600	378.500
3	0.00023	10.100	10.100	342.500
4	0.00047	9.900	9.900	274.500

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

5	0.00094	3.917	3.917	67.500
6	0.0019	4.000	4.000	32.500
7	0.0037	4.333	4.333	20.000

Calculated H Value = 35.563 Critical H Value Table = 12.590
 Since Calc H > Crit H REJECT Ho: All groups are equal.

Sunflower plant height (cm), lbs ai/A; Day 21
 File: 1937fl Transform: NO TRANSFORMATION

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP							
				0	0	0	0	0	0	0	0
5	0.00094	3.917	3.917	\							
6	0.0019	4.000	4.000	.	\						
7	0.0037	4.333	4.333	.	.	\					
4	0.00047	9.900	9.900	.	.	.	\				
3	0.00023	10.100	10.100	*	.	.	.	\			
2	0.00012	10.600	10.600	*	*	.	.	.	\		
1	neg control	11.175	11.175	*	*	*	.	.	.	\	

* = significant difference (p=0.05) . = no significant difference
 Table q value (0.05,7) = 3.038 Unequal reps - multiple SE values

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	7.6E-05	2.7E-05	0.00021	0.22	0.36
EC10	0.00014	5.9E-05	0.00032	0.18	0.43
EC25	0.00037	0.00021	0.00067	0.12	0.56
EC50	0.0011	0.00080	0.0016	0.077	0.70

Slope = 1.40 Std.Err. = 0.216

!!!Poor fit: p < 0.001 based on DF= 4.00 48.0

1937FL : Sunflower plant height (cm), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	10.0	11.2	11.6	-0.454	100.	0.00
0.000120	10.0	10.6	10.6	-0.0272	91.4	8.61
0.000230	10.0	10.1	9.70	0.401	83.4	16.6
0.000470	10.0	9.90	8.19	1.71	70.4	29.6
0.000940	8.00	3.92	6.35	-2.44	54.6	45.4
0.00190	4.00	4.00	4.40	-0.399	37.8	62.2
0.00370	3.00	4.33	2.76	1.57	23.8	76.2

!!!Warning: EC5 not bracketed by doses evaluated.

Sunflower % survival, lbs ai/A; Day 21

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

File: 1937fs

Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	100.000	100.000	490.000
2	0.00012	100.000	100.000	490.000
3	0.00023	100.000	100.000	490.000
4	0.00047	100.000	100.000	490.000
5	0.00094	55.000	55.000	284.500
6	0.0019	10.000	10.000	126.000
7	0.0037	7.500	7.500	114.500

Calculated H Value = -269.989 Critical H Value Table = 12.590
Since Calc H < Crit H FAIL TO REJECT Ho: All groups are equal.

Sunflower % survival, lbs ai/A; Day 21

File: 1937fs

Transform: NO TRANSFORMATION

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP						
				0	0	0	0	0	0	0
				7	6	5	4	1	2	3
7	0.0037	7.500	7.500	\						
6	0.0019	10.000	10.000	.	\					
5	0.00094	55.000	55.000	.	.	\				
4	0.00047	100.000	100.000	*	*	.	\			
1	neg control	100.000	100.000	*	*	.	.	\		
2	0.00012	100.000	100.000	*	*	.	.	.	\	
3	0.00023	100.000	100.000	*	*	.	.	.	.	\

* = significant difference (p=0.05)

. = no significant difference

Table q value (0.05,7) = 3.038

SE = 8.862

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.00029	0.00016	0.00052	0.13	0.56
EC10	0.00038	0.00023	0.00063	0.11	0.60
EC25	0.00059	0.00040	0.00087	0.084	0.68
EC50	0.00097	0.00075	0.0013	0.057	0.77

Slope = 3.11 Std.Err. = 0.472

Goodness of fit: p = 0.059 based on DF= 4.0 63.

1937FS : Sunflower % survival, lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
------	--------	--------------	---------------	----------------	-------------------	---------

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

0.00	10.0	100.	104.	-3.98	100.	0.00
0.000120	10.0	100.	104.	-3.73	99.8	0.235
0.000230	10.0	100.	101.	-1.30	97.4	2.58
0.000470	10.0	100.	87.0	13.0	83.7	16.3
0.000940	10.0	55.0	53.8	1.16	51.8	48.2
0.00190	10.0	10.0	19.0	-8.96	18.2	81.8
0.00370	10.0	7.50	3.68	3.82	3.54	96.5

Tomato dry weight (g), lbs ai/A; Day 21

File: 1937tw Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	10.571	1.762	22.025
Within (Error)	62	4.959	0.080	
Total	68	15.530		

Critical F value = 2.25 (0.05,6,60)

Since F > Critical F REJECT Ho:All groups equal

Tomato dry weight (g), lbs ai/A; Day 21

File: 1937tw Transform: NO TRANSFORMATION

BONFERRONI T-TEST

TABLE 1 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	1.434	1.434		
2	0.000063	1.779	1.779	-2.725	
3	0.00012	1.585	1.585	-1.191	
4	0.00023	1.434	1.434	0.006	
5	0.00047	1.590	1.590	-1.229	
6	0.00094	1.346	1.346	0.703	
7	0.0019	0.434	0.434	7.695	*

Bonferroni T table value = 2.46 (1 Tailed Value, P=0.05, df=60,6)

Tomato dry weight (g), lbs ai/A; Day 21

File: 1937tw Transform: NO TRANSFORMATION

BONFERRONI T-TEST

TABLE 2 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	10			
2	0.000063	10	0.312	21.7	-0.345
3	0.00012	10	0.312	21.7	-0.151
4	0.00023	10	0.312	21.7	0.001
5	0.00047	10	0.312	21.7	-0.155
6	0.00094	10	0.312	21.7	0.089
7	0.0019	9	0.320	22.3	1.000

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Tomato dry weight (g), lbs ai/A; Day 21
File: 1937tw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)				TABLE 1 OF 2	
GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	10	1.434	1.434	1.607
2	0.000063	10	1.779	1.779	1.607
3	0.00012	10	1.585	1.585	1.585
4	0.00023	10	1.434	1.434	1.512
5	0.00047	10	1.590	1.590	1.512
6	0.00094	10	1.346	1.346	1.346
7	0.0019	9	0.434	0.434	0.434

Tomato dry weight (g), lbs ai/A; Day 21
File: 1937tw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)				TABLE 2 OF 2	
IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	1.607				
0.000063	1.607	1.363		1.67	k= 1, v=62
0.00012	1.585	1.191		1.75	k= 2, v=62
0.00023	1.512	0.612		1.77	k= 3, v=62
0.00047	1.512	0.612		1.78	k= 4, v=62
0.00094	1.346	0.703		1.79	k= 5, v=62
0.0019	0.434	7.696	*	1.79	k= 6, v=62

s = 0.283

Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound
		Lower	Upper		/Estimate
EC5	0.00074	0.00052	0.0011	0.080	0.69
EC10	0.00087	0.00064	0.0012	0.067	0.74
EC25	0.0011	0.00090	0.0014	0.046	0.81
EC50	0.0015	0.0013	0.0017	0.027	0.89

Slope = 5.48 Std.Err. = 1.11

Goodness of fit: p = 0.16 based on DF= 4.0 62.

1937TW : Tomato dry weight (g), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
------	--------	-----------	------------	-------------	----------------	---------

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

0.00	10.0	1.43	1.57	-0.131	100.	0.00
6.30e-05	10.0	1.78	1.57	0.214	100.	2.70e-12
0.000120	10.0	1.59	1.57	0.0201	100.	1.07e-07
0.000230	10.0	1.43	1.57	-0.131	100.	0.000454
0.000470	10.0	1.59	1.56	0.0297	99.7	0.311
0.000940	10.0	1.35	1.35	-0.00214	86.1	13.9
0.00190	9.00	0.434	0.434	0.000249	27.7	72.3

Tomato plant height (cm), lbs ai/A; Day 21
File: 1937t1 Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	702.243	117.041	23.784
Within (Error)	62	305.074	4.921	
Total	68	1007.318		

Critical F value = 2.25 (0.05,6,60)
Since F > Critical F REJECT Ho:All groups equal

Tomato plant height (cm), lbs ai/A; Day 21
File: 1937t1 Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	19.725	19.725		
2	0.000063	20.575	20.575	-0.857	
3	0.00012	19.725	19.725	0.000	
4	0.00023	19.775	19.775	-0.050	
5	0.00047	21.025	21.025	-1.310	
6	0.00094	18.375	18.375	1.361	
7	0.0019	10.676	10.676	8.878	*

Bonferroni T table value = 2.46 (1 Tailed Value, P=0.05, df=60,6)

Tomato plant height (cm), lbs ai/A; Day 21
File: 1937t1 Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	10			
2	0.000063	10	2.443	12.4	-0.850
3	0.00012	10	2.443	12.4	0.000
4	0.00023	10	2.443	12.4	-0.050
5	0.00047	10	2.443	12.4	-1.300
6	0.00094	10	2.443	12.4	1.350
7	0.0019	9	2.510	12.7	9.049

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

Tomato plant height (cm), lbs ai/A; Day 21
File: 1937tl Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	10	19.725	19.725	20.165
2	0.000063	10	20.575	20.575	20.165
3	0.00012	10	19.725	19.725	20.165
4	0.00023	10	19.775	19.775	20.165
5	0.00047	10	21.025	21.025	20.165
6	0.00094	10	18.375	18.375	18.375
7	0.0019	9	10.676	10.676	10.676

Tomato plant height (cm), lbs ai/A; Day 21
File: 1937tl Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	20.165				
0.000063	20.165	0.444		1.67	k= 1, v=62
0.00012	20.165	0.444		1.75	k= 2, v=62
0.00023	20.165	0.444		1.77	k= 3, v=62
0.00047	20.165	0.444		1.78	k= 4, v=62
0.00094	18.375	1.361		1.79	k= 5, v=62
0.0019	10.676	8.879	*	1.79	k= 6, v=62

s = 2.218

Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.00082	0.00058	0.0012	0.076	0.71
EC10	0.0010	0.00076	0.0013	0.059	0.76
EC25	0.0014	0.0012	0.0016	0.032	0.86
EC50	0.0020	0.0018	0.0022	0.019	0.92

Slope = 4.31 Std.Err. = 0.899

Goodness of fit: p = 0.65 based on DF= 4.0 62.

1937TL : Tomato plant height (cm), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
------	--------	--------------	---------------	----------------	-------------------	---------

Data Evaluation Report on the Acute Toxicity of AE 0317309 03 EC23 A8 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2447

EPA MRID Number 468019-37

0.00	10.0	19.7	20.2	-0.433	100.	0.00
6.30e-05	10.0	20.6	20.2	0.417	100.	5.80e-09
0.000120	10.0	19.7	20.2	-0.433	100.	8.06e-06
0.000230	10.0	19.8	20.2	-0.383	100.	0.00288
0.000470	10.0	21.0	20.1	0.940	99.6	0.362
0.000940	10.0	18.4	18.5	-0.121	91.8	8.24
0.00190	9.00	10.7	10.7	0.0147	52.9	47.1

!!!Warning: EC50 not bracketed by doses evaluated.

Tomato % survival, lbs ai/A; Day 21

File: 1937ts Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	100.000	100.000	385.000
2	0.000063	100.000	100.000	385.000
3	0.00012	100.000	100.000	385.000
4	0.00023	100.000	100.000	385.000
5	0.00047	100.000	100.000	385.000
6	0.00094	100.000	100.000	385.000
7	0.0019	67.500	67.500	175.000

Calculated H Value = 9.096 Critical H Value Table = 12.590

Since Calc H < Crit H FAIL TO REJECT Ho: All groups are equal.

Tomato % survival, lbs ai/A; Day 21

File: 1937ts Transform: NO TRANSFORMATION

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP						
				0	0	0	0	0	0	0
7	0.0019	67.500	67.500	\						
2	0.000063	100.000	100.000	.	\					
3	0.00012	100.000	100.000	.	.	\				
4	0.00023	100.000	100.000	.	.	.	\			
5	0.00047	100.000	100.000	.	.	.	.	\		
6	0.00094	100.000	100.000	.	.	.	.	.	\	
1	neg control	100.000	100.000	.	.	.	.	.	.	\

* = significant difference (p=0.05)

Table q value (0.05,7) = 3.038

. = no significant difference

SE = 9.102

Conversion of Study Authors' Toxicity Values

Cucumber	L product/ha	g ai/ha	lbs ai/A
EC25	0.078	2.925	0.00257
Lower 95% C.I.	0.046	1.725	0.00152
Upper 95% C.I.	0.136	5.1	0.00449
EC50	0.109	4.0875	0.00360
Lower 95% C.I.	0.072	2.7	0.00238
Upper 95% C.I.	0.280	10.5	0.00924
Oilseed Rape			
EC25	0.028	1.05	0.00092
Lower 95% C.I.	0.024	0.9	0.000792
Upper 95% C.I.	0.032	1.2	0.00106
EC50	0.039	1.4625	0.00129
Lower 95% C.I.	0.034	1.275	0.00112
Upper 95% C.I.	0.045	1.6875	0.00149
Soybean			
EC25	0.071	2.6625	0.00234
Lower 95% C.I.	0.008	0.3	0.000264
Upper 95% C.I.	>0.125	>4.6875	>0.0041
EC50	0.096	3.6	0.00317
Lower 95% C.I.	0.040	1.5	0.00132
Upper 95% C.I.	>0.125	>4.6875	>0.0041
Sugar beet			
EC25	0.032	1.2	0.00106
Lower 95% C.I.	0.015	0.5625	0.00050
Upper 95% C.I.	0.046	1.725	0.00152
EC50	0.048	1.8	0.00158
Lower 95% C.I.	0.031	1.1625	0.00102
Upper 95% C.I.	0.078	2.925	0.00257
Sunflower			
EC25	0.026	0.975	0.000858
Lower 95% C.I.	0.011	0.4125	0.00036
Upper 95% C.I.	0.038	1.425	0.00125
EC50	0.038	1.425	0.00125
Lower 95% C.I.	0.024	0.9	0.00079
Upper 95% C.I.	0.062	2.325	0.00205

Tomato			
EC25	0.035	1.3125	0.00116
Lower 95% C.I.	0.002	0.075	0.00007
Upper 95% C.I.	ND	ND	ND
 EC50	 0.047	 1.7625	 0.00155
Lower 95% C.I.	ND	ND	ND
Upper 95% C.I.	ND	ND	ND

Corn Dry Weight (g)

	Negative Control	0.0019	0.0037	0.0075
Rep 1	3.331	2.821	3.730	2.635
Rep 2	3.563	2.261	3.614	2.726
Rep 3	2.558	2.729	3.240	3.908
Rep 4	3.061	3.158	3.571	3.077
Rep 5	3.957	3.413	2.611	3.035
Rep 6	3.221	3.826	3.767	3.759
Rep 7	3.467	3.758	3.670	3.210
Rep 8	3.464	2.949	2.435	3.742
Mean	3.328	3.114	3.330	3.262
% Reduction	N/A	6	0	2

0.015	0.030
2.412	2.974
3.271	3.013
3.738	3.129
2.515	3.725
2.872	3.739
2.954	3.202
3.112	3.346
2.348	2.304
2.903	3.179
13	4

Corn dry weight (g), lbs ai/A; Day 21

6

8

8

8

8

8

8

neg control

3.331

3.563

2.558

3.061

3.957

3.221

3.467

3.464

0.0019

2.821

2.261

2.729

3.158

3.413

3.826

3.758

2.949

0.0037

3.730

3.614

3.240

3.571

2.611

3.767

3.670

2.435

0.0075

2.635

2.726

3.908

3.077

3.035

3.759

3.210

3.742

0.015

2.412

3.271

3.738

2.515

2.872

2.954

3.112

2.348

0.030

2.974

3.013

3.129

3.725
3.739
3.202
3.346
2.304

Cucumber Dry Weight (g)

	Negative Control	0.00012	0.00023	0.00047
Rep 1	2.450	3.177	2.660	1.002
Rep 2	3.200	3.019	3.219	1.883
Rep 3	2.927	2.977	2.452	1.279
Rep 4	2.129	2.534	2.238	0.586
Rep 5	3.012	2.543	1.876	2.642
Rep 6	2.350	1.634	1.211	1.751
Rep 7	2.819	2.213	3.103	1.627
Rep 8	2.974	1.580	1.973	2.279
Rep 9	3.627	2.006	1.399	1.294
Rep 10	2.924	1.658	2.066	1.936
<i>Mean</i>	<i>2.841</i>	<i>2.334</i>	<i>2.220</i>	<i>1.628</i>
<i>% Reduction</i>	<i>N/A</i>	<i>18</i>	<i>22</i>	<i>43</i>

0.00094	0.0019	0.0037
1.308	1.384	1.606
1.497	0.872	0.493
0.874	2.351	
1.310	2.202	0.645
0.717	1.002	0.922
0.945	0.874	1.462
1.843	1.566	0.386
1.555	1.762	0.267
0.823	0.871	0.509
0.497	0.459	0.667
1.137	1.334	0.773
60	53	73

Cucumber Dry Weight (g)

	Negative Control	0.00012	0.00023	0.00047
Rep 1	2.450	3.177	2.660	1.002
Rep 2	3.200	3.019	3.219	1.883
Rep 3	2.927	2.977	2.452	1.279
Rep 4	2.129	2.534	2.238	0.586
Rep 5	3.012	2.543	1.876	2.642
Rep 6	2.350	1.634	1.211	1.751
Rep 7	2.819	2.213	3.103	1.627
Rep 8	2.974	1.580	1.973	2.279
Rep 9	3.627	2.006	1.399	1.294
Rep 10	2.924	1.658	2.066	1.936
Mean	2.841	2.334	2.220	1.628
% Reduction	N/A	18	22	43

0.00094	0.0019	0.0037
1.308	1.384	1.606
1.497	0.872	0.493
0.874	2.351	
1.310	2.202	0.645
0.717	1.002	0.922
0.945	0.874	1.462
1.843	1.566	0.386
1.555	1.762	0.267
0.823	0.871	0.509
0.497	0.459	0.667
1.137	1.334	0.773
60	53	73

Cucumber % survival, lbs ai/A; Day 21

7

10

10

10

10

10

10

10

neg control

100

100

100

100

100

100

100

100

100

100

0.00012

100

100

100

100

100

100

100

100

100

100

0.00023

100

100

100

100

100

100

100

100

100

100

0.00047

100

100

100

100

100

100

100

100

100

100

0.00094

100

100

100

C

100
100
100
100
100
100
100
0.0019
100
100
100
100
100
100
75
100
100
100
100
0.0037
75
100
0
25
50
25
50
75
25
25

Cucumber dry weight (g), lbs ai/A; Day 21

7

10

10

10

10

10

10

9

neg control

2.45000000

3.20000000

2.92700000

2.12900000

3.01200000

2.35000000

2.81900000

2.97400000

3.62700000

2.92400000

0.00012

3.17700000

3.01900000

2.97700000

2.534

2.54300000

1.63400000

2.21300000

1.58000000

2.00600000

1.65800000

0.00023

2.66000000

3.21900000

2.45200000

2.23800000

1.87600000

1.21100000

3.10300000

1.97300000

1.39900000

2.06600000

0.00047

1.00200000

1.88300000

1.27900000

0.58600000

2.64200000

1.75100000

1.62700000

2.27900000

1.29400000

1.93600000

0.00094

1.30800000

1.49700000

0.87400000

1.31000000
0.71700000
0.94500000
1.84300000
1.55500000
0.82300000
0.49700000
0.0019
1.38400000
0.87200000
2.35100000
2.20200000
1.00200000
0.87400000
1.56600000
1.76200000
0.87100000
0.45900000
0.0037
1.60600000
0.49300000
0.64500000
0.92200000
1.46200000
0.38900000
0.26700000
0.50900000
0.66700000

Nominal Application Rates

Stock Solution #	10	9	8	7	6	5
L product/ha	0.002	0.004	0.008	0.016	0.032	0.063
g ai/ha	0.08	0.15	0.29	0.59	1.17	2.34
lbs ai/A	0.000070	0.00013	0.00026	0.00052	0.0010	0.0021
% Recovery	90.9	89.4	91.1	91.5	91.7	91.0
% Recovery	89.1	87.0	89.6	89.9	90.4	90.3
Mean Recovery	90.0	88.2	90.4	90.7	91.1	90.7
Mean-Measured Application Rates (lbs ai/A)	0.000063	0.00012	0.00023	0.00047	0.00094	0.0019

4	3	2	1
0.125	0.25	0.5	1
4.69	9.38	18.75	37.5
0.0041	0.0083	0.017	0.033
91.0			
90.4	90.6	90.7	90.2
90.7	90.6	90.7	90.2
0.0037	0.0075	0.015	0.030

Nominal Application Rates

L product/ha	g ai/ha	
Negative Control	Negative Control	
0.002	0.08	x 0.0022 lb/g
0.004	0.15	x 0.0022 lb/g
0.008	0.29	x 0.0022 lb/g
0.016	0.59	x 0.0022 lb/g
0.032	1.17	x 0.0022 lb/g
0.063	2.34	x 0.0022 lb/g
0.125	4.69	x 0.0022 lb/g
0.25	9.38	x 0.0022 lb/g
0.5	18.75	x 0.0022 lb/g
1	37.5	x 0.0022 lb/g

		lbs ai/A
0		0
0.000176	x 0.4 ha/A	0.000070
0.00033	x 0.4 ha/A	0.00013
0.00064	x 0.4 ha/A	0.00026
0.00130	x 0.4 ha/A	0.00052
0.0026	x 0.4 ha/A	0.0010
0.0051	x 0.4 ha/A	0.0021
0.0103	x 0.4 ha/A	0.0041
0.021	x 0.4 ha/A	0.0083
0.041	x 0.4 ha/A	0.017
0.0825	x 0.4 ha/A	0.033

Oat Shoot Length (cm)

	Negative Control	0.0019	0.0037
Rep 1	85.800	84.600	79.400
Rep 2	81.200	79.600	74.600
Rep 3	81.200	79.600	77.400
Rep 4	78.000	91.200	88.400
Rep 5	73.200	87.600	82.000
Rep 6	77.600	69.800	84.400
Rep 7	77.400	77.600	87.000
Rep 8	79.200	83.600	77.400
Mean	79.200	81.700	81.325
% Reduction	N/A	-3	-3

0.0075	0.015	0.030
80.400	90.400	77.800
83.200	81.200	80.200
75.800	80.800	73.600
90.600	82.600	66.400
77.600	80.000	78.000
86.200	83.400	76.400
77.600	77.600	68.400
86.800	91.200	77.800
82.275	83.400	74.825
-4	-5	6

Oat dry weight (g), lbs ai/A; Day 21

6

8

8

8

8

8

8

neg control

1.6

1.196

1.420

1.5

1.294

0.978

1.024

1.128

0.0019

1.151

1.370

1.406

1.624

1.566

0.969

1.313

1.297

0.0037

0.971

0.829

1.237

2.044

1.360

1.428

1.357

1.512

0.0075

1.245

1.288

1.090

1.485

1.190

1.571

0.976

1.593

0.015

1.632

1.383

1.496

1.093

1.208

1.518

1.377

1.662

0.030

1.051

1.086

1.047

0.850

0.981

0.843

1

1.262

Oat plant height (cm), lbs ai/A; Day 21

6

8

8

8

8

8

8

neg control

85.8

81.2

81.2

78

73.2

77.6

77.4

79.2

0.0019

84.6

79.6

79.6

91.2

87.6

69.8

77.6

83.6

0.0037

79.4

74.6

77.4

88.4

82

84.4

87

77.4

0.0075

80.4

83.2

75.8

90.6

77.6

86.2

77.6

86.8

0.015

90.4

81.2

80.8

82.6

80

83.4

77.6

91.2

0.030

77.8

80.2

73.6

66.4

78

76.4

68.4

77.8

Oilseed rape Percent Emergence and
Survival

Application Rate (lbs ai/A)

Negative Control

	# Survived	% Survival	Survival % Red.
Rep 1	5	100	N/A
Rep 2	5	100	
Rep 3	5	100	
Rep 4	5	100	
Rep 5	5	100	
Rep 6	5	100	
Rep 7	5	100	
Rep 8	5	100	
Mean		100	
0.000063			
Rep 1	5	100	0
Rep 2	5	100	
Rep 3	5	100	
Rep 4	5	100	
Rep 5	5	100	
Rep 6	5	100	
Rep 7	5	100	
Rep 8	5	100	
Mean		100	
0.00012			
Rep 1	5	100	0
Rep 2	5	100	
Rep 3	5	100	
Rep 4	5	100	
Rep 5	5	100	
Rep 6	5	100	
Rep 7	5	100	
Rep 8	5	100	
Mean		100	
0.00023			
Rep 1	5	100	0
Rep 2	5	100	
Rep 3	5	100	
Rep 4	5	100	
Rep 5	5	100	
Rep 6	5	100	
Rep 7	5	100	
Rep 8	5	100	
Mean		100	
0.00047			
Rep 1	5	100	
Rep 2	5	100	
Rep 3	5	100	
Rep 4	5	100	
Rep 5	5	100	

Rep 6	5	100	
Rep 7	5	100	
Rep 8	5	100	
Mean		100	0

0.00094

Rep 1	4	80	
Rep 2	4	80	
Rep 3	4	80	
Rep 4	4	80	
Rep 5	2	40	
Rep 6	2	40	
Rep 7	4	80	
Rep 8	2	40	
Mean		65	35

0.0019

Rep 1	2	40	
Rep 2	0	0	
Rep 3	0	0	
Rep 4	0	0	
Rep 5	0	0	
Rep 6	0	0	
Rep 7	2	40	
Rep 8	1	20	
Mean		13	88

Oilseed rape % survival, lbs ai/A; Day 21

7

8

8

8

8

8

8

8

neg control

100

100

100

100

100

100

100

100

0.000063 .

100

100

100

100

100

100

100

100

0.00012

100

100

100

100

100

100

100

100

0.00023

100

100

100

100

100

100

100

100

0.00047

100

100

100

100

100

100

100

100

0.00094

80

80

80
80
40
40
80
40
0.0019
40
0
0
0
0
0
40
20

Oilseed rape dry weight (g), lbs ai/A; Day 21

7

8

8

8

8

8

8

3

neg control

2.897

2.841

2.595

2.332

2.523

3.031

2.8

2.674

0.000063

2.621

2.445

2.804

2.628

2.214

1.625

2.315

2.033

0.00012

2.591

2.380

1.903

2.699

1.780

2.081

2.850

2.344

0.00023

2.550

1.996

2.352

2.810

1.889

2.454

2.360

2.544

0.00047

2.301

2.259

2.293

2.751

2.101

2.540

1.917

2.224

0.00094

0.542

0.763

2.143
0.232
0.239
0.270
0.842
0.639
0.0019
0.155
0.198
0.572

Onion Dry Weight (g)

	Negative Control	0.00094	0.0019	0.0037
Rep 1	0.085	0.135	0.180	0.078
Rep 2	0.087	0.135	0.116	0.131
Rep 3	0.087	0.117	0.095	0.099
Rep 4	0.196	0.119	0.109	0.200
Rep 5	0.137	0.129	0.129	0.047
Rep 6	0.130	0.137	0.109	0.108
Rep 7	0.105	0.155	0.160	0.112
Rep 8	0.173	0.144	0.182	0.034
<i>Mean</i>	<i>0.125</i>	<i>0.134</i>	<i>0.135</i>	<i>0.101</i>
<i>% Reduction</i>	<i>N/A</i>	<i>-7</i>	<i>-8</i>	<i>19</i>

0.0075	0.015	0.030
0.099	0.168	0.118
0.108	0.171	0.165
0.087	0.193	0.033
0.137	0.157	0.050
0.113	0.164	0.133
0.154	0.131	0.127
0.141	0.162	0.141
0.118	0.147	0.126
0.120	0.162	0.112
4	-29	11

Onion dry weight (g), lbs ai/A; Day 21

7

8

8

8

8

8

8

8

neg control

0.085

0.087

0.087

0.193

0.137

0.130

0.105

0.173

0.00094

0.135

0.135

0.117

0.119

0.129

0.137

0.155

0.144

0.0019

0.180

0.116

0.095

0.109

0.129

0.109

0.160

0.182

0.0037

0.078

0.131

0.099

0.2

0.047

0.108

0.112

0.034

0.0075

0.099

0.108

0.087

0.137

0.113

0.154

0.141

0.118

0.015

0.168

0.171

0.193
0.157
0.164
0.131
0.162
0.147
0.030
0.118
0.165
0.033
0.050
0.133
0.127
0.141
0.126

Onion plant height (cm), lbs ai/A; Day 21

7

8

8

8

8

8

8

8

neg control

22.0000000

25.0000000

20.4000000

29.2000000

27.6000000

28.0000000

26.2500000

33.2000000

0.00094

25.6000000

24.8000000

25.4000000

29.4000000

28.0000000

30.2000000

27.4000000

26.8000000

0.0019

29.4000000

26.0000000

23.0000000

26.2000000

25.6000000

25.8000000

24.8000000

30.0000000

0.0037

23.6000000

30.4000000

23.4000000

28.4000000

16.6000000

25.2000000

28.6000000

23.6000000

0.0075

24.8000000

23.0000000

20.8000000

28.2000000

23.8000000

28.4000000

20.6000000

24.2000000

0.015

27.0000000

30.0000000

29.2000000
32.8000000
23.8000000
25.8000000
27.4000000
26.6000000
0.030
24.0000000
27.8000000
15.4000000
18.8
23.7500000
25.8000000
22.0000000
27.0000000

Ryegrass Dry Weight (g)

	Negative Control	0.00094	0.0019	0.0037
Rep 1	0.669	0.625	0.749	0.838
Rep 2	0.446	0.582	0.668	0.784
Rep 3	0.728	0.732	0.755	0.686
Rep 4	0.902	0.592	0.680	0.739
Rep 5	0.472	0.563	0.699	0.622
Rep 6	0.713	0.606	0.668	0.825
Rep 7	0.790	0.686	0.635	0.730
Rep 8	0.537	0.527	0.588	0.631
Mean	0.657	0.614	0.680	0.732
% Reduction	N/A	7	-4	-11

0.0075	0.015	0.030
0.507	0.575	0.519
0.662	0.399	0.564
0.596	0.668	0.623
0.663	0.680	0.520
0.483	0.821	0.581
0.465	0.614	0.420
0.653	0.631	0.512
0.780	0.613	0.430
0.601	0.625	0.521
9	5	21

Ryegrass dry weight (g), lbs ai/A; Day 21

7

8

8

8

8

8

8

8

neg control

0.669

0.446

0.728

0.902

0.472

0.713

0.790

0.537

0.00094

0.625

0.582

0.732

0.592

0.563

0.606

0.686

0.527

0.0019

0.749

0.668

0.755

0.680

0.699

0.668

0.635

0.588

0.0037

0.838

0.784

0.686

0.739

0.622

0.825

0.730

0.631

0.0075

0.507

0.662

0.596

0.663

0.483

0.465

0.653

0.780

0.015

0.575

0.399

0.668
0.680
0.821
0.614
0.631
0.613
0.030
0.519
0.564
0.623
0.520
0.581
0.420
0.512
0.430

Ryegrass plant height (cm), lbs ai/A; Day 21

7

8

8

8

8

8

8

8

neg control

45

40.6

48.6

40.8

42.2

45

47

37

0.00094

41

45.2

43

45.4

46.2

43.6

43

37.4

0.0019

44

47.2

49.6

47

44.2

40.6

45.6

39.6

0.0037

43.6

45.8

46.4

45.2

38.6

44.8

39

41.2

0.0075

47.6

39.2

41.2

40

40.2

41.6

42.2

44.6

0.015

41

40.2

41.4

43

41.6

43.8

49.6

44

0.030

39.2

37.8

38

39.8

44.2

32.4

37.2

34.6

Soybean Dry Weight (g)

	Negative Control	0.00012	0.00023	0.00047
Rep 1	2.009	1.331	1.607	1.569
Rep 2	1.531	0.845	1.253	1.657
Rep 3	1.792	1.200	0.707	1.543
Rep 4	1.444	1.058	1.183	1.694
Rep 5	0.872	1.723	1.346	1.513
Rep 6	1.533	1.672	1.300	1.508
Rep 7	1.010	1.158	1.652	1.523
Rep 8	1.636	1.128	1.212	0.711
Rep 9	1.910	1.420	1.742	1.405
Rep 10	1.109	1.128	1.002	1.016
Mean	1.485	1.266	1.300	1.414
% Reduction	N/A	15	12	5

0.00094	0.0019	0.0037
0.640	1.026	0.204
1.169	1.311	0.123
0.897	1.042	0.206
1.136	1.537	0.211
0.658	1.224	0.136
0.527	0.946	
0.771	1.118	0.167
0.870	0.758	0.193
1.201	1.041	0.248
0.857	0.920	0.030
0.873	1.092	0.169
41	26	89

Soybean % survival, lbs ai/A; Day 21

7

8

8

8

8

8

8

8

neg control

100

100

100

100

100

100

100

100

0.00012

100

100

100

100

100

100

100

100

0.00023

100

100

100

100

100

100

100

100

0.00047

100

100

100

100

100

100

100

100

0.00094

100

100

100

100

100

100

100

100

0.0019

100

100

100
100
100
100
100
100
0.0037
75
75
100
100
100
0
50
50

Soybean dry weight (g), lbs ai/A; Day 21

7

10

10

10

10

10

10

9

neg control

2.009

1.531

1.792

1.444

0.872

1.533

1.010

1.636

1.910

1.109

0.00012

1.331

0.845

1.200

1.058

1.723

1.672

1.158

1.128

1.420

1.128

0.00023

1.607

1.253

0.707

1.183

1.346

1.3

1.652

1.212

1.742

1.002

0.00047

1.569

1.657

1.543

1.694

1.513

1.508

1.523

0.711

1.405

1.016

0.00094

0.640

1.169

0.897

1.136
0.658
0.527
0.771
0.870
1.201
0.857
0.0019
1.026
1.311
1.042
1.537
1.224
0.946
1.118
0.758
1.041
0.920
0.0037
0.204
0.123
0.206
0.211
0.136
0.167
0.193
0.248
0.030

Soybean plant height (cm), lbs ai/A; Day 21

7

10

10

10

10

10

10

9

neg control

30.5

27.5

30.75

27.5

25.5

24.5

23.75

27.5

28.25

25.25

0.00012

26.75

22

23.25

21

34.25

31

22.250

23.75

30.5

26

0.00023

31

27.75

27

27.25

27.75

24.5

30.75

28.5

29

24.5

0.00047

26.25

28.75

31.25

30.75

29.25

27.75

27

19.25

27

21.75

0.00094

19.5

23.75

21.75

23.5
18.75
20.5
22
22.75
24.25
23.75
0.0019
21.75
27.5
22.5
26.25
23.5
20.75
27.75
24
27.25
24.75
0.0037
15.333
12.667
16.75
16.5
16.75
14
14.5
14.5
15

Sugar beet Dry Weight (g)

	Negative Control	0.00012	0.00023	0.00047
Rep 1	1.568	1.364	1.613	1.081
Rep 2	1.643	1.664	1.369	1.223
Rep 3	1.622	1.369	1.224	1.450
Rep 4	1.770	1.214	1.257	1.653
Rep 5	1.360	1.132	1.523	1.325
Rep 6	1.675	1.593	1.445	1.158
Rep 7	1.362	1.503	1.096	1.516
Rep 8	1.186	1.427	1.192	0.360
Mean	1.523	1.408	1.340	1.221
% Reduction	N/A	8	12	20

0.00094	0.0019	0.0037
0.762	0.944	0.499
0.439		
0.657	0.324	0.728
0.471		
0.298		
0.651	1.021	
0.072	0.404	0.361
0.602		1.077
0.494	0.673	0.666
68	56	56

Sugar beet % survival, lbs ai/A; Day 21

7

8

8

8

8

8

8

8

neg control

100

100

100

100

100

100

100

100

0.00012

100

100

100

100

100

100

100

100

0.00023

100

100

100

100

100

100

100

100

0.00047

100

100

100

100

100

100

100

100

0.00094

100

100

80

80

100

40

80

20

0.0019

20

0

60
0
0
20
0
40
0.0037
60
0
20
0
0
0
20
20

Sugar beet dry weight (g), lbs ai/A; Day 21

7

8

8

8

8

8

4

4

neg control

1.568

1.643

1.622

1.770

1.360

1.675

1.362

1.186

0.00012

1.364

1.664

1.369

1.214

1.132

1.593

1.503

1.427

0.00023

1.613

1.369

1.224

1.257

1.523

1.445

1.096

1.192

0.00047

1.081

1.223

1.450

1.653

1.325

1.158

1.516

0.360

0.00094

0.762

0.439

0.657

0.471

0.298

0.651

0.072

0.602

0.0019

0.944

0.324

1.021
0.404
0.0037
0.499
0.728
0.361
1.077

Sugar beet plant height (cm), lbs ai/A; Day 21

7

8

8

8

8

8

4

4

neg control

18.4

21.6

17

21.2

17.8

21

21.2

19.8

0.00012

19.2

16.8

18.8

19.8

18.2

18.8

19.4

21.6

0.00023

20

19.2

20.6

18

20.2

23.8

20

16.6

0.00047

19.2

18.6

19

20

20.4

20.4

18.6

20.4

0.00094

11.6

14.8

11.25

13

11.6

15.5

10.25

11

0.0019

14

12.667

17
8.5
0.0037
12.333
11
10
15

Sunflower Dry Weight (g)

	Negative Control	0.00012	0.00023	0.00047
Rep 1	1.360	1.558	1.486	1.632
Rep 2	1.186	1.503	1.259	1.341
Rep 3	1.176	1.435	1.171	1.512
Rep 4	1.674	1.445	1.255	1.607
Rep 5	1.564	1.465	1.433	0.918
Rep 6	1.249	1.190	1.257	1.384
Rep 7	1.758	1.158	1.292	1.461
Rep 8	1.486	1.590	1.171	1.505
Rep 9	1.436	1.058	1.450	1.621
Rep 10	1.338	0.808	1.316	1.358
Mean	1.423	1.321	1.309	1.434
% Reduction	N/A	7	8	-1

0.00094	0.0019	0.0037
0.163		1.107
0.258		0.215
0.209	0.463	0.217
0.272	0.152	
0.234	0.231	
0.362	0.107	
0.494		
0.321		
0.289	0.238	0.513
80	83	64

Sunflower % survival, lbs ai/A; Day 21

7

10

10

10

10

10

10

10

neg control

100

100

100

100

100

100

100

100

100

100

0.00012

100

100

100

100

100

100

100

100

100

100

0.00023

100

100

100

100

100

100

100

100

100

100

0.00047

100

100

100

100

100

100

100

100

100

100

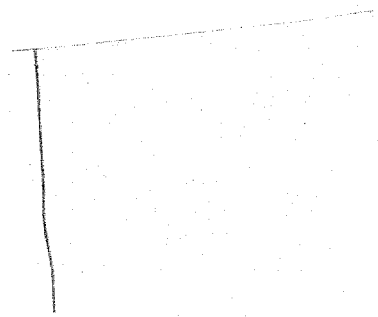
0.00094

100

0

50

25
0
50
100
100
50
75
0.0019
0
0
0
0
25
25
25
25
0
0
0.0037
0
25
0
25
0
0
25
0
0
0
0



Sunflower dry weight (g), lbs ai/A; Day 21

7

10

10

10

10

8

4

3

neg control

1.360

1.186

1.176

1.674

1.564

1.249

1.758

1.486

1.436

1.338

0.00012

1.558

1.503

1.435

1.445

1.465

1.190

1.158

1.590

1.058

0.808

0.00023

1.486

1.259

1.171

1.255

1.433

1.257

1.292

1.171

1.450

1.316

0.00047

1.632

1.341

1.512

1.607

0.918

1.384

1.461

1.505

1.621

1.358

0.00094

0.163

0.258

0.209

0.272
0.234
0.362
0.494
0.321
0.0019
0.463
0.152
0.231
0.107
0.0037
1.107
0.215
0.217

Sunflower plant height (cm), lbs ai/A; Day 21

7
10
10
10
10
8
4
3
neg control
10.5
9.75
10
11.5
12.5
12
13.5
11.25
9.5
11.25
0.00012
10
11
10.25
11
11.75
10.25
9.75
12.75
9.25
10
0.00023
10
10
10
10.25
10.5
10.25
10.5
9.75
10.25
9.5
0.00047
10.25
9.75
9.75
11.5
9.5
9.5
9.5
10
9.75
9.5
0.00094
3.25
3.5
3

4
4.25
4.5
4.5
4.333
0.0019
5
4
4
3
0.0037
7
3
3

Tomato Dry Weight (g)

	Negative Control	0.000063	0.00012	0.00023
Rep 1	1.332	1.553	1.876	1.133
Rep 2	1.329	1.524	1.692	1.198
Rep 3	1.228	1.829	1.373	1.569
Rep 4	1.613	1.642	1.737	1.266
Rep 5	1.804	1.796	1.266	1.426
Rep 6	1.277	2.090	1.347	1.154
Rep 7	1.761	2.066	1.699	1.563
Rep 8	1.707	2.127	1.646	1.949
Rep 9	1.279	1.602	1.343	1.753
Rep 10	1.014	1.562	1.872	1.326
Mean	1.434	1.779	1.585	1.434
% Reduction	N/A	-24	-11	0

0.00047	0.00094	0.0019
1.464	1.374	0.328
1.198	1.700	0.171
1.995	1.178	1.290
1.237	0.770	0.473
1.903	1.511	0.363
1.626	1.728	0.389
1.446	1.012	0.281
1.561	1.384	0.379
1.528	1.021	0.235
1.940	1.777	
1.590	1.346	0.434
-11	6	70

Tomato % survival, lbs ai/A; Day 21

7

10

10

10

10

10

10

10

neg control

100

100

100

100

100

100

100

100

100

100

0.000063

100

100

100

100

100

100

100

100

100

100

0.00012

100

100

100

100

100

100

100

100

100

100

0.00023

100

100

100

100

100

100

100

100

100

100

0.00047

100

100

100

100
100
100
100
100
100
100
0.00094
100
100
100
100
100
100
100
100
100
100
100
0.0019
50
100
100
100
50
75
100
75
25
0

Tomato dry weight (g), lbs ai/A; Day 21

7

10

10

10

10

10

10

9

neg control

1.332

1.329

1.228

1.613

1.804

1.277

1.761

1.707

1.279

1.014

0.000063

1.553

1.524

1.829

1.642

1.796

2.090

2.066

2.127

1.602

1.562

0.00012

1.876

1.692

1.373

1.737

1.266

1.347

1.699

1.646

1.343

1.872

0.00023

1.133

1.198

1.569

1.266

1.426

1.154

1.563

1.949

1.753

1.326

0.00047

1.464

1.198

1.995

1.237
1.903
1.626
1.446
1.561
1.528
1.940
0.00094
1.374
1.7
1.178
0.770
1.511
1.728
1.012
1.384
1.021
1.777
0.0019
0.328
0.171
1.290
0.473
0.363
0.389
0.281
0.379
0.235

Tomato plant height (cm), lbs ai/A; Day 21

7

10

10

10

10

10

10

9

neg control

22.25

22.25

18.75

19

21

18.5

19

19.75

18.75

18

0.000063

20

23.75

21.25

21

19

21.25

18.25

20.25

18

23

0.00012

19.75

20

20.75

19.25

18.75

19.25

22

21.25

15.25

21

0.00023

18

20.25

21

16.75

22.5

19.25

18.75

22

21

18.25

0.00047

19.75

21.75

20.25

22
20.25
22.5
23
22.75
17.25
20.75
0.00094
16.75
19.5
19
12.5
17
20
17.5
20.75
18.75
22
0.0019
8
8
18.25
13
8
13
8.5
10.333
9