Data Evaluation Report on the Acute Toxicity of AE 0317309 02 SE06 A102 to Terrestrial Vascular Plants: Vegetative Vigor

<u>PMRA Submission Number 2006-2446</u>   <u>EPA MRID Number 468019-27</u>

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 02 SE06 A102   **Purity:** 4.53% w/w
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   **Signature:**
Staff Scientist, Cambridge Environmental Inc.   **Date:** 5/11/06

Secondary Reviewer: Teri S. Myers   **Signature:**
Senior Scientist, Cambridge Environmental Inc.   **Date:** 5/27/06

Primary Reviewer: Melissa Panger   **Date:** 9/29/06
EPA

Secondary Reviewer: J.D. Whall (Officer No. 1268)   **Date:** 11/17/06
 PMRA

Secondary Reviewer: David McAdam   **Date:** 9 Nov 2006
Australian Gvernment Department of the Environment and Heritage (DEH)

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

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

Date Evaluation Completed: 12-01-2006

<u>**CITATION**</u>: Pallet, K. and H. Gosch. 2006. Non-target terrestrial plants: Vegetative vigor test (Tier 2) AE 0317309 + Mefenpyr di-ethyl (AE F107892); Suspo-emulsion: 50+12.5 g/L (Code: AE 0317309 02 SE06 A102). Unpublished study performed by Bayer CropScience GmbH, Ecotoxicology, Frankfurt am Main, Germany. Laboratory report number VV04/005. Study sponsored by Bayer CropScience GmbH, Ecotoxicology, Frankfurt am Main, Germany. Study complete on January 10, 2006.

<u>**DISCLAIMER**</u>: 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

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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.

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EXECUTIVE SUMMARY:

The effect of AE 0317309 02 SE06 A102 (formulation containing the active ingredient AE 0317309; pyrasulfotole) on the vegetative vigor of monocot (corn, *Zea mays*; oat, *Avena sativa*; barley, *Hordeum vulgare*; ryegrass, *Lolium perenne*) and dicot (cucumber, *Cucumis sativus*; oilseed rape, *Brassica napus*; soybean, *Glycine max*; sugar beet, *Beta vulgaris*; sunflower, *Helianthus annuus*; tomato, *Lycopersicon esculentum*) crops was studied at varying nominal application rates. AE 0317309 02 SE06 A 102 is proposed for use on selected cereal crops at a one time application rate 1 L product/ha (or, 50 g a.i./ha). Ryegrass and oat were treated with nominal application rates of 0 (negative control), 0.00622, 0.0125, 0.0249, 0.0498 and 0.0994 lbs ai/A (or, 0, 7.1, 14.2, 28.3, 56.6 and 113 g a.i./ha). Onion and corn were treated with nominal application rates of 0 (negative control), 0.00311, 0.00622, 0.0125, 0.0249, 0.0498 and 0.0994 lbs ai/A (or, 0, 3.5, 7.1, 14.2, 28.3, 56.6 and 113 g a.i./ha). Cucumber, sunflower, soybean, oilseed rape, sugar beet and tomato were treated with nominal application rates of 0 (negative control), 0.000199, 0.000399, 0.000797, 0.00156, 0.00311 and 0.00622 lbs ai/A (or, 0, 0.23, 0.45, 0.89, 1.8, 3.5 and 7.1 g a.i./ha). Measured concentrations in the highest treatment rate were 95.7% of nominal values. 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. Plant height results could not be statistically verified by the reviewer because appropriate replicate data were not provided.

With the exception of ryegrass, the plant dry weight was significantly affected by AE 0317309 02 SE06 A102 treatment in all species. The most sensitive monocot species, based on dry weight, in the vegetative vigor test was onion with an EC_{25} of 0.017 lbs ai/A and a NOAEC of 0.0125 lbs ai/A. The most sensitive dicot species, based on dry weight, was tomato with an EC_{25} of 0.00081 lbs ai/A and a NOAEC 0.000797 lbs ai/A.

Observed phytotoxic effects included bleaching, chlorosis, necrosis and growth suspension. At test termination all species were observed with phytotoxic symptoms, with the exception of ryegrass, which had recovered from the effects observed on Day 7.

Maximum Labeled Rate: Not reported

Results Synopsis

<u>Monocot</u>
    <u>Monocot</u>
    EC_{05}/IC_{05}: 0.0041 lbs ai/A (4.6 g a.i./ha)   95% C.I.: 0.0010-0.016 lbs ai/A   (1.1 – 17.9 g a.i./ha)
    EC_{25}/IC_{25}: 0.017 lbs ai/A (19.1 g a.i./ha)   95% C.I.: 0.0078-0.036 lbs ai/A   (8.7 – 40.4 g a.i./ha)
    EC_{50}/IC_{50}: 0.044 lbs ai/A (49.3 g a.i./ha)   95% C.I.: 0.029-0.068   (32.5 – 76.2 g a.i./ha)
    NOAEC: 0.0125 (14.2 g a.i./ha)
    Slope: 1.59
    Std err: 0.381
    Most sensitive monocot: Onion
    Most sensitive parameter: Dry Weight

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<u>Dicot</u>
EC_{05}/IC_{05}: 0.00023 lbs ai/A (0.26 g a.i./ha) 95% C.I.: $4.3E^{-05}$-0.0012 lbs ai/A (0.048 – 1.35 g a.i./ha)
EC_{25}/IC_{25}: 0.00081 lbs ai/A (0.91 g a.i./ha) 95% C.I.: 0.00029-0.0022 lbs ai/A (0.33 – 2.5 g a.i./ha)
EC_{50}/IC_{50}: 0.0019 lbs ai/A (2.1 g a.i./ha) 95% C.I.: 0.0010-0.0036 lbs ai/A (1.1 – 4.0 g a.i./ha)
NOAEC: 0.000797 lbs ai/A (0.89 g a.i./ha)
Slope: 1.78
Std err: 0.503
Most sensitive dicot: Tomato
Most sensitive parameter: Dry Weight

This toxicity study is classified as **SUPPLEMENTAL** to the **US EPA** and **ACCEPTABLE** to the **PMRA** and **DEH** 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}
Monocots					
Corn	Dry Weight	0.0249	0.020	0.042	0.072
Oat	Dry Weight	0.0249	0.015	0.050	>0.0944
Onion	**Dry Weight**	**0.0125**	**0.0041**	**0.017**	**0.044**
Ryegrass	Dry Weight	0.0944	ND	>0.0944	>0.0944
Dicots					
Cucumber	Dry Weight	0.000797	0.00066	0.0029	>0.00622
Oilseed rape	Dry Weight	0.000797	0.00068	0.0015	0.0027
Soybean	Dry Weight	0.000797	0.00056	0.0016	0.0034
Sugar beet	Dry Weight	0.000399	0.00049	0.0011	0.0020
Sunflower	Dry Weight	0.00156	0.0017	0.0029	0.0040
Tomato	**Dry Weight**	**0.000797**	**0.00023**	**0.00081**	**0.0019**

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

Species	Endpoint	NOAEC	EC_{05}	EC_{25}	EC_{50}
Monocots					
Corn	Dry Weight	28.3	22.4	47.1	80.7
Oat	Dry Weight	28.3	16.8	56.0	>113
Onion	**Dry Weight**	**14.2**	**4.6**	**19.1**	**49.3**
Ryegrass	Dry Weight	113	ND	>113	>113
Dicots					
Cucumber	Dry Weight	0.89	0.74	3.3	>7.1
Oilseed rape	Dry Weight	0.89	0.76	1.7	3.0
Soybean	Dry Weight	0.89	0.62	1.8	3.8
Sugar beet	Dry Weight	0.45	0.55	1.2	2.2
Sunflower	Dry Weight	1.8	1.9	3.3	4.5
Tomato	**Dry Weight**	**0.89**	**0.26**	**0.91**	**2.1**

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-

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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:

1. The maximum label rate of the test material was not reported.
2. The physiochemical properties of the test material were not reported.
3. Mean-measured concentrations were not determined. Only the highest application rate was measured for the presence of the active ingredient (AE 0317309).

4. The reviewer was unable to statistically analyze plant height because the study authors only reported the range of values within each replicate and the treatment mean; no replicate mean values were reported.
5. The LOQ and LOD were not reported.
6. The geographic location, CEC and moisture content at 1/3 atmospheres were not reported.
7. All species were tested under the same environmental conditions instead of testing cold-preferring species separately from warm-preferring species.
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. Glasshouse environmental control was set at 23±5°C day and 15±5°C night. Minor deviations up to 36°C and down to 10°C occurred for short periods of time and the study authors did not feel that this deleteriously impacted plant growth. The same occurred with relative humidity which ranged from 20 to 100%.

The deviations did impact the acceptability of the study for the US EPA.

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 02 SE06 A102
Description:	Light Yellow Milky Liquid
Lot No./Batch No. :	35893-VI (Batch Number)
Purity:	4.53% w/w
Stability of compound under test conditions:	Samples of the highest application rate (0.0994 lbs ai/A) were collected and analyzed on Day 0. Percent recoveries were 95.7% of nominal. The other application rates were not analyzed for the presence of the active ingredient AE 0317309. *(OECD recommends chemical stability in water and light)*

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Storage conditions of
test chemicals: Stored at 25±5°C

Table 2. Physical/chemical properties of [AE 0317309].

Parameter	Value	Comment
Molecular weight	362.3 g/mol	
Water Solubility (g/L) at 20°C	4.2 at pH 4 69.1 at pH 7 49.0 at pH 9	Very soluble
Vapor Pressure/Volatility	2.7×10^{-7} Pa at 20°C 6.8×10^{-7} Pa at 25°C	Non-volatile
UV Absorption	water $\lambda_{max} = 264$ 0.1M HCl $\lambda_{max} = 241$ 0.1M NaOH $\lambda_{max} = 216$	Not likely to undergo photolysis.
Pka	4.2 ± 0.15	
log K_{ow} at 23°C	0.276 at pH 4 -1.362 at pH 7 -1.58 at pH 9	Not likely to bioaccumulate
Stability of compound at room temperature, if provided		No significant degradation over 12 months at ambient temperatures.

Data obtained from pyrasulfatole chemistry review of Submission 2006-2445.

2. Test organism:

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

Dicotyledonous species: Cucumber (*Cucumis sativus*, Family Curcubitaceae, Delikatess), Oilseed rape (*Brassica napus*, Family Brassicaceae, Liratop), Soybean (*Glycine max*, Family Fabaceae, Trail), 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.

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

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B. STUDY DESIGN:

1. Experimental Conditions

a. Limit test: A limit test was not conducted.

b. Range-finding study: A range-finding study was not conducted.

c. Definitive Study

Table 3: Experimental Parameters - Vegetative Vigor

Parameters	Vegetative Vigor	
	Details	**Remarks**
		Criteria
Duration of the test	21 Days	*Recommended test duration is 14-21 days.*
Number of seeds/plants replicate	<u>Cucumber, Sunflower and Tomato:</u> 4 plants/rep <u>Oilseed rape, Soybean, Sugar beet, Corn, Oat, Onion and Ryegrass:</u> 5 plants/rep	*Five plants per replicate are recommended.*
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.
<u>Number of replicates</u> Control: Adjuvant control: Treated:	<u>Cucumber, Sunflower and Tomato:</u> 10 reps/control and treatment <u>Oilseed rape, Soybean, Sugar beet, Corn, Oat, Onion and Ryegrass:</u> 8 reps/control and treatment	A solvent control was not used. *Four replicates per dose are recommended*

Parameters	Vegetative Vigor	
	Details	**Remarks**
		Criteria
Test concentrations (mg ai/kg soil and g ai/ha) Nominal:	Ryegrass and Oat: 0 (negative control), 0.00622, 0.0125, 0.0249, 0.0498 and 0.0994 lbs ai/A or	Mean-measured concentrations were not determined. Only the highest application rate was measured for the presence of the active ingredient (AE 0317309).
	0 (negative control), 7.1, 14.2, 28.3, 56.6 and 113 g a.i./ha.	*Five test concentrations should be used with a dose range of 2X or 3X progression*
Nominal:	Onion and Corn: 0 (negative control), 0.00311, 0.00622, 0.0125, 0.0249, 0.0498 and 0.0994 lbs ai/A, or	
	0 (negative control), 3.5, 7.1, 14.2, 28.3, 56.6 and 113 g a.i./ha.	
Nominal:	Cucumber, Oilseed rape, Soybean, Sunflower, Sugar beet and Tomato: 0 (negative control), 0.000199, 0.000399, 0.000797, 0.00156, 0.00311 and 0.00622 lbs ai/A, or	
	0 (negative control), 0.23, 0.45, 0.89, 1.8, 3.5 and 7.1 g a.i./ha.	
Measured:	Samples of the highest application rate (0.0994 lbs ai/A) were analyzed and yielded a percent recovery of 95.7% of nominal.	
Method and interval of analytical verification LOQ: LOD:	The highest application rate was analyzed on Day 0 using HPLC. Not reported Not reported	
Adjuvant (type, percentage, if used)	N/A; an adjuvant was not used.	
Test container (pot)	Onion:	Pots were commercial plastic flower pots.

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Parameters	Vegetative Vigor	
	Details	**Remarks**
		Criteria
Size/Volume	10 cm diameter x 9 cm high All Other Species: 13 cm diameter x 10 cm high	*Non-porous containers should be used.* *OECD recommends that non-porous plastic or glazed pots be used.*
Material: (glass/polystyrene)	Plastic	
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 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 16-37 days prior to testing.	
Test material application Application time including the plant growth stage Number of application Application interval Method of application	Test material was applied to all plants at the 2-4 true leaf stage. 1 N/A; single application Spray booth equipped with a laboratory track sprayer	
Details of soil used Geographic location Depth of soil collection Soil texture % sand	Not reported 2 mm Silty loam 14.2%	Soil was obtained from Bayer CropScience GmbH, Global Biology Herbicides, Horticulture, H 872, Industriepark Hoechst, 65926 Frankfurt am Main.

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Parameters	Vegetative Vigor	
	Details	**Remarks**
		Criteria
% silt % clay pH: % organic carbon CEC Moisture at 1/3 atm (%)	65.1% 20.7% 7.4 1.19% Not reported Not reported	*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..* *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.*
Details of nutrient medium, if used	A solution of 0.1% liquid fertilizer (Wurax super) was given April 30 and May 05, 2004.	
Watering regime and schedules 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.	*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.*
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.
Test conditions Temperature: Photoperiod: Light intensity and quality: Relative humidity:	10-36°C 16L:8D 4076-25880 lux 20-100%	Glasshouse environmental control was set at 23±5°C day and 15±5°C night. Minor deviations up to 36°C and down to 10°C occurred for short periods of time and the study authors did not feel that this deleteriously impacted plant growth. 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.

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Parameters	Vegetative Vigor	
	Details	**Remarks**
		Criteria
		EPA prefers that the cold vs warm loving plants be tested in two separate groups to optimize plant growth. *OECD prefers that the temperature, humidity and light conditions be suitable for maintaining normal growth of each species for the test period.*
Reference chemical (if used) Name: Concentrations:	N/A N/A	A reference chemical was not used.
Other parameters, if any	None	

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	

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Were raw data included?	Raw data for survival, dry weight and phytotoxicity were included. While replicate data for shoot length were provided, values represented a range, rather than a replicate mean; individual shoot length data were not provided to calculate replicate means.	
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 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	Any plant considered dead was not rated for phytotoxicity.

II. RESULTS and DISCUSSION:

A. INHIBITORY EFFECTS:

Vegetative Vigor:

Ryegrass was the only species which did not exhibit significant reductions relative to the negative control for any of the endpoints analyzed (survival, plant height and biomass). Onion, sugar beet and tomato were the only species that exhibited reductions of ≥25% in percent survival, relative to the negative control. All dicot species and onion (a monocot) exhibited reductions of ≥25% in plant height, relative to the negative control. Ryegrass was the only species that did not exhibit a reduction of ≥25% in dry weight, relative to the negative control. All other species exhibited a reduction of ≥25% in dry weight, however, cucumber was the only species, with the exception of ryegrass, in which the reduction was <25%. All observed effects appeared to be dose-dependent, although not always in a linear fashion. The most sensitive monocot, based on dry weight, was onion with NOAEC and EC$_{25}$ values of 0.0125 and 0.0254 lbs ai/A, respectively. The most sensitive dicot, based on dry weight, was tomato with NOAEC and EC$_{25}$ values of 0.000797 and 0.00108 lbs ai/A, respectively.

No phytotoxic effects were observed in the controls for any of the species tested. By test termination, ryegrass was the only species which was not observed with phytotoxic symptoms. Slight symptoms (10-

20%) were observed on Day 7, yet full recovery occurred by Day 14 and persisted throughout the remainder
of the test. Symptoms were observed in the two highest treatment levels for oat on Day 7 (0.0498 and
0.0994 lbs ai/A), but by test termination, plants in the 0.0498 lbs ai/A treatment level had fully recovered
and the severity of the effects in the 0.0994 lbs ai/A decreased from 30-40% on Day 7 to 10-20% on Day
21. All other species exhibited symptoms in two or more treatment levels and a dose-dependent
relationship was apparent in that the severity and frequency of symptoms increased with application rate.
Observed phytotoxic effects included bleaching, chlorosis, necrosis and growth suspension. 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). The study authors did
not report analyzing plant height; however, NOAEC and ECx values for plant height were provided by the study
authors.

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Table 5: Reported effect of AE 0317309 02 SE06 A102 on Vegetative Vigor

Species	Results summary for biomass (lbs ai/A)									
	Dry weight (g)*	NOAEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI	slope	std err
Corn	1.620-4.450	0.0249	NR	NR	0.0396	0.0207-0.0523	0.0694	0.0526-ND	NR	NR
Oat	1.279-2.309	0.0249	NR	NR	0.0506	0.0420-0.0587	>0.0994	N/A	NR	NR
Onion	0.022-0.063	0.0125	NR	NR	0.0254	0.00474-0.0423	0.0625	0.0368-ND	NR	NR
Ryegrass	0.559-0.751	0.0994	NR	NR	>0.0994	N/A	>0.0994	N/A	NR	NR
Cucumber	1.835-3.452	0.00311	NR	NR	>0.00622	N/A	>0.00622	N/A	NR	NR
Oilseed Rape	0.626-3.698	0.000797	NR	NR	0.00151	0.00124-0.00175	0.00267	0.00235-0.00303	NR	NR
Soybean	0.621-2.054	0.000797	NR	NR	0.00171	0.00144-0.00195	0.00347	0.00307-0.00395	NR	NR
Sugar beet	0.218-2.209	0.000399	NR	NR	0.00124	0.00112-0.00132	0.00207	0.00199-0.00219	NR	NR
Sunflower	0.252-1.273	0.00156	NR	NR	0.00291	0.00271-0.00307	0.00407	0.00387-0.00427	NR	NR
Tomato	0.149-1.061	0.000797	NR	NR	0.00108	ND	0.00215	ND	NR	NR

* 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 02 SE06 A102 to Terrestrial Vascular Plants: Vegetative Vigor

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Table 5a: Reported effect of AE 0317309 02 SE06 A102 on Vegetative Vigor

Species	Results summary for height (lbs ai/A)									
	Plant height (cm)*	NOAEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI	slope	std err
Corn	75.1-96.4	0.0249	NR	NR	>0.0994	N/A	>0.0994	N/A	NR	NR
Oat	75.4-80.4	0.0498	NR	NR	>0.0994	N/A	>0.0994	N/A	NR	NR
Onion	6.2-11.6	0.0249	NR	NR	0.0491	0.0224-0.0725	>0.0994	N/A	NR	NR
Ryegrass	26.1-33.8	0.0125	NR	NR	>0.0994	N/A	>0.0994	N/A	NR	NR
Cucumber	25.3-39.0	0.000399	NR	NR	0.00399	0.00144-ND	>0.00622	N/A	NR	NR
Oilseed Rape	10.1-22.5	0.000399	NR	NR	0.00247	0.00124-0.00347	0.00566	0.00407-0.0122	NR	NR
Soybean	29.0-39.8	0.000797	NR	NR	0.00562	0.00454-0.00757	>0.00622	N/A	NR	NR
Sugar beet	6.0-23.0	0.000399	NR	NR	0.00171	0.0024-0.00211	0.00351	0.00291-0.00435	NR	NR
Sunflower	4.4-10.9	0.000797	NR	NR	0.00355	ND	0.00542	ND	NR	NR
Tomato	2.5-13.6	0.000797	NR	NR	0.00140	0.000598-0.00199	0.00247	0.00171-0.00371	NR	NR

* 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 02 SE06 A102 to Terrestrial Vascular Plants: Vegetative Vigor

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Table 5b: Reported effect of AE 0317309 02 SE06 A102 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	0.0994	NR	NR	>0.0994	N/A	>0.0994	N/A	NR	NR
Oat	100	0.0994	NR	NR	>0.0994	N/A	>0.0994	N/A	NR	NR
Onion	25-100	0.0498	NR	NR	0.0507	0.0140-0.0929	0.0643	0.0299-ND	NR	NR
Ryegrass	100	0.0994	NR	NR	>0.0994	N/A	>0.0994	N/A	NR	NR
Cucumber	100	0.00622	NR	NR	>0.00622	N/A	>0.0622	N/A	NR	NR
Oilseed Rape	95-100	0.00622	NR	NR	>0.00622	N/A	>0.0622	N/A	NR	NR
Soybean	98-100	0.00622	NR	NR	>0.00622	N/A.	>0.0622	N/A	NR	NR
Sugar beet	55-100	0.00311	NR	NR	0.00327	0.000518-0.00861	0.00423	0.00171-0.0308	NR	NR
Sunflower	97.5-100	0.00622	NR	NR	>0.00622	N/A	>0.0622	N/A	NR	NR
Tomato	45-100	0.00156	NR	NR	0.00339	0.00271-0.00423	0.00546	0.00431-0.00694	NR	NR

* range provided represents the range of the treatment means
N/A- Not applicable
ND- Not determined
NR- Not reported

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Plant Injury Index*											
Control	Corn	Oat	Onion	Ryegrass	Cucumber	Oilseed rape	Soybean	Sugar beet	Sunflower	Tomato	Adjuvant control
0%	0-80%	0-40%	0-80%	0-20%	0-60%	0-80%	0-60%	0-100%	0-80%	0-100%	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 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. Plant height was not able to be analyzed because replicate mean values were not reported (only the range within each replicate was reported). 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 nominal application rates, which the reviewer converted to lbs ai/A

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Table 6: Reviewer-calculated effect of AE 0317309 02 SE06 A102 on Vegetative Vigor

Species	Results summary for biomass (lbs ai/A)									
	Dry weight (g)*	NOAEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI	slope	std err
Corn	1.620-4.450	0.0249	0.020	0.012-0.032	0.042	0.033-0.054	0.072	0.063-0.082	2.96	0.493
Oat	1.279-2.309	0.0249	0.015	0.0070-0.034	0.050	0.036-0.069	>0.0944	N/A	1.91	0.424
Onion	0.022-0.063	0.0125	0.0041	0.0010-0.016	0.017	0.0078-0.036	0.044	0.029-0.068	1.59	0.381
Ryegrass	0.559-0.751	0.0944	ND	ND	>0.0944	N/A	>0.0944	N/A	ND	ND
Cucumber	1.835-3.452	0.000797	0.00066	0.00024-0.0018	0.0029	0.0020-0.0044	>0.00622	N/A	1.49	0.341
Oilseed Rape	0.626-3.698	0.000797	0.00068	0.00045-0.0010	0.0015	0.0012-0.0020	0.0027	0.0023-0.0032	2.73	0.292
Soybean	0.621-2.054	0.000797	0.00056	0.00039-0.00078	0.0016	0.0013-0.0020	0.0034	0.0031-0.0038	2.09	0.160
Sugar beet	0.218-2.209	0.000399	0.00049	0.00037-0.00065	0.0011	0.00094-0.0013	0.0020	0.0018-0.0022	2.68	0.183
Sunflower	0.252-1.273	0.00156	0.0017	0.0013-0.0023	0.0029	0.0024-0.0034	0.0040	0.0036-0.0045	4.47	0.549
Tomato	0.149-1.061	0.000797	0.00023	$4.3E^{-05}$-0.0012	0.00081	0.00029-0.0022	0.0019	0.0010-0.0036	1.78	0.503

* range provided represents the range of the treatment means
N/A- Not applicable
ND- Not determined
NR- Not reported

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Table 6a: Reported effect of AE 0317309 02 SE06 A102 on Seedling Emergence

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	0.0944	>0.0944	N/A	>0.0944	N/A	>0.0944	N/A	N/A	N/A
Oat	100	0.0944	>0.0944	N/A	>0.0944	N/A	>0.0944	N/A	N/A	N/A
Onion	25-100	0.0498	ND	ND	ND	ND	ND	ND	ND	ND
Ryegrass	100	0.0944	>0.0944	N/A	>0.0944	N/A	>0.0944	N/A	N/A	N/A
Cucumber	100	0.00622	>0.00622	N/A	>0.00622	N/A	>0.00622	N/A	N/A	N/A
Oilseed Rape	95-100	0.00622	ND	ND	>0.00622	N/A	>0.00622	N/A	N/A	N/A
Soybean	98-100	0.00622	>0.00622	N/A	>0.00622	N/A	>0.00622	N/A	N/A	N/A
Sugar beet	55-100	0.00311	ND	ND	ND	ND	>0.00622	N/A	ND	ND
Sunflower	97.5-100	0.00622	>0.00622	N/A	>0.00622	N/A	>0.00622	N/A	N/A	N/A
Tomato	45-100	0.00156	0.0013	0.00069-0.0025	0.0030	0.0022-0.0041	0.0054	0.0045-0.0064	2.67	0.574

* range provided represents the range of the treatment means
N/A- Not applicable
ND- Not determined
NR- Not reported

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Plant Injury Index*											
Control	Corn	Oat	Onion	Ryegrass	Cucumber	Oilseed rape	Soybean	Sugar beet	Sunflower	Tomato	Adjuvant control
0%	0-80%	0-40%	0-80%	0-20%	0-60%	0-80%	0-60%	0-100%	0-80%	0-100%	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

EC_{05}/IC_{05}: 0.0041 lbs ai/A (4.6 g a.i./ha)   95% C.I.: 0.0010-0.016 lbs ai/A   (1.1 – 17.9 g a.i./ha)
EC_{25}/IC_{25}: 0.017 lbs ai/A (19.1 g a.i./ha)   95% C.I.: 0.0078-0.036 lbs ai/A   (8.7 – 40.4 g a.i./ha)
EC_{50}/IC_{50}: 0.044 lbs ai/A (49.3 g a.i./ha)   95% C.I.: 0.029-0.068   (32.5 – 76.2 g a.i./ha)
NOAEC: 0.0125   (14.2 g a.i./ha)
Slope: 1.59
Std err: 0.381
Most sensitive monocot: Onion
Most sensitive parameter: Dry Weight

Dicot

EC_{05}/IC_{05}: 0.00023 lbs ai/A   (0.26 g a.i./ha)   95% C.I.: $4.3E^{-05}$-0.0012 lbs ai/A   (0.048 – 1.35 g a.i./ha)
EC_{25}/IC_{25}: 0.00081 lbs ai/A   (0.91 g a.i./ha)   95% C.I.: 0.00029-0.0022 lbs ai/A   (0.33 – 2.5 g a.i./ha)
EC_{50}/IC_{50}: 0.0019 lbs ai/A   (2.1 g a.i./ha)   95% C.I.: 0.0010-0.0036 lbs ai/A   (1.1 – 4.0 g a.i./ha)
NOAEC: 0.000797 lbs ai/A   (0.89 g a.i./ha)
Slope: 1.78
Std err: 0.503
Most sensitive dicot: Tomato
Most sensitive parameter: Dry Weight

D. STUDY DEFICIENCIES:

Because EC_{25} values could not be determined for onion and sugar beet survival, the reviewer is unsure whether dry weight was in fact the most sensitive endpoint for both of the species. Additionally, the reviewer was unable to statistically analyze plant height because the study authors only reported the range of values within each replicate and the treatment mean; no replicate mean values were reported.

E. REVIEWERS' COMMENTS:

The reviewers' conclusions were identical to the study authors', in that onion and tomato were the most sensitive species based on dry weight; the NOAEC estimates were identical, but EC_x values differed slightly. The reviewers' statistical analysis provided more reliable 95% confidence intervals, EC_{05} values and probit slopes (when applicable); therefore, the reviewers' results for the most sensitive monocot and dicot are provided in the Executive Summary and Conclusions sections of this DER.

The percent inhibitions for ryegrass dry weight were -18, -5, 7, -20 and 11% at the nominal 0.00622, 0.0125, 0.0249, 0.0498 and 0.0944 lbs ai/A treatment levels, respectively, relative to the negative control. Because the response was non-linear and did not appear to be dose-dependent, the reviewer agrees with the statistical output

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that the NOAEC value is 0.0944 lbs ai/A, despite the 11% reduction at this level. The reviewer's statistical software was unable to determine the EC_{05} value for ryegrass dry weight; however, because a reliable NOAEC was determined and the EC_{25} and EC_{50} values were visually determined to be greater than the highest treatment level (0.0944 lbs ai/A), the reviewer does not feel the lack of an EC_{05} negatively impacts the acceptability or scientific validity of the study.

The percent inhibitions for sunflower dry weight were -2, 0, 0, 2, 30 and 80% at the nominal 0.000199, 0.000399, 0.000797, 0.00156, 0.00311 and 0.00622 lbs ai/A treatment levels, respectively, relative to the negative control. Because the of the non-linear response of the data, the reviewer had to analyze the data using a non-parametric test; consequently, the reviewer's analysis did not detect a significant difference at the 0.00311 lbs ai/A treatment level despite the 30% inhibition at this level. The reviewer visually determined the NOAEC value to be 0.00156 lbs ai/A.

The percent inhibitions for tomato dry weight were -8, -41, 1, 47, 80 and 64% at the nominal 0.000199, 0.000399, 0.000797, 0.00156, 0.00311 and 0.00622 lbs ai/A treatment levels, respectively, relative to the negative control. Because the of the non-linear response of the data, the reviewer had to analyze the data using a non-parametric test; consequently, the reviewer's analysis did not detect a significant difference at the 0.00156 lbs ai/A treatment level despite the 47% inhibition at this level, which the reviewer felt to be significant. The reviewer visually determined the NOAEC value to be 0.000797 lbs ai/A.

The highest treatment level for onion, 0.0994 lbs ai/A, was the only treatment level which exhibited a reduction in survival relative to the negative control; a reduction of 75% was observed. As a reduction was only observed at this one treatment level, a non-linear response of the data was observed. Because only two distinct isotone means were observed where three or more are necessary, probit analysis was unable to accurately determine ECx values based on onion survival data. The PMRA reviewer-calculated EC_{25} estimate for onion survival was 75.4 g a.i./ha (95% CI: 71.44 – 80.10 g a.i./ha) using the Norberg-King (1993) ICp model. This model can be used to provide a non-parametric endpoint estimation for continuous survival data (ToxStat 1996).

A 5% reduction in oilseed rape percent survival was observed at the highest treatment level, 0.00622 lbs ai/A; reductions were not observed in any of the other treatment levels. As only two distinct isotone means existed where three or more are necessary, the probit analysis was unable to determine an EC_{05} value; however, a reliable NOAEC value was determined.

The highest treatment level for sugar beet, 0.00622 lbs ai/A, was the only treatment level which exhibited a reduction in survival relative to the negative control; a reduction of 45% was observed. As a reduction was only observed at this one treatment level, a non-linear response of the data was observed. Because only two distinct isotone means were observed where three or more are necessary, probit analysis was unable to accurately determine EC_{05} and EC_{25} values based on sugar beet survival data. The PMRA reviewer-calculated EC_{25} estimate for sugar beet survival was 5.5 g a.i./ha (95% CI: N/A) using the Norberg-King (1993) ICp model.

The percent inhibitions for tomato percent survival were 0% at the nominal 0.000199-0.00156 lbs ai/A treatment levels, and 30 and 55% in the nominal 0.00311 and 0.00622 lbs ai/A treatment levels, respectively, relative to the negative control. Because the of the non-linear response of the data, the reviewer had to analyze the data using a non-parametric test; consequently, the reviewer's analysis did not detect a significant difference at the 0.00311 lbs ai/A treatment level despite the 30% inhibition at this level, which the reviewer felt to be significant. The reviewer visually determined the NOAEC value to be 0.00156 lbs ai/A.

Based on EC_{25} values for onion and sugar beet survival determined using ICp analysis, it appears that dry weight is the most sensitive endpoint for these species. The reviewer-reported NOAEC and EC_{25} values for dry weight for both species are reported in Table 1 (Summary of most sensitive parameters by species) in this DER.

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The reviewer was unable to statistically analyze plant height because the study authors only reported the range of values within each replicate and the treatment mean; no replicate mean values were reported. Based on the treatment mean values, the reviewer was able to calculate the percent reductions at each treatment level, relative to the negative control, for each species. Onion was the only monocot species to exhibit a reduction of >25% relative to the negative control. The reductions for oat and ryegrass were ≤10% at all treatment levels relative to the negative control. Corn exhibited reductions of 17.5 and 20.2% at the nominal 0.0498 and 0.0944 lbs ai/A treatment levels, respectively, and the dose-response relationship appeared to be dose dependent. All dicot species exhibited reductions of >25% in plant height at one or more treatment levels, relative to each species' negative control. All dose-responses relationships appeared both linear and dose-dependent; however, the lack of plant height raw data precludes the statistical verification of the study authors' results.

The study authors report that only the highest application rate was analytically verified for the presence of the material. Percent recovery was 95.7% of nominal. Because only the highest application rate was analytically verified and not all species received the same range of doses, the reviewer did not use the one mean-measured application in the statistical analyses.

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.

The test material, AE 0317309 02 SE06 A102, was a formulation containing the active ingredients AE 0317309 (purity of 4.53% w/w) and AE F107892 (purity of 1.17% w/w). The reviewer corrected all nominal application rates for the purity of AE 0317309 and converted theses rates into lbs ai/A.

The DEH reviewer notes that while tomatoes had the lowest EC25 in the plant biomass (dry shoot weight), sugar beet had the lowest LOEC and NOEC of 0.02 and 0.01 kg product/ha, corresponding to 0.91 and 0.45 g ac/ha.

The dates of experimental work for the definitive seedling emergence study were April 13-May 18, 2004.

F. CONCLUSIONS:

The study is considered **SUPPLEMENTAL** to the US EPA and **ACCEPTABLE** to the PMRA and DEH. The most sensitive monocot, based on dry weight, was onion with NOAEC and EC_{25} values of 0.0125 and 0.017 lbs ai/A, respectively. The most sensitive dicot, based on dry weight, was tomato with NOAEC and EC_{25} values of 0.000797 and 0.00081 lbs ai/A, respectively.

Most sensitive monocot and EC_{25}: Onion (Dry Weight), 0.017 lbs ai/A (or, 19.1 g a.i./ha)
Most sensitive dicot and EC_{25}: Tomato (Dry Weight), 0.00081 lbs ai/A (or, 0.91 g a.i./ha)

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III. REFERENCES:

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APPENDIX I. OUTPUT OF REVIEWER'S STATISTICAL VERIFICATION:

```
Corn dry weight (g), lbs ai/A; Day 21
File: 1927cw        Transform: NO TRANSFORMATION


                          ANOVA TABLE
--------------------------------------------------------------------

SOURCE              DF            SS              MS              F
--------------------------------------------------------------------
Between              6          55.089          9.181          21.860

Within (Error)      49          20.558          0.420

--------------------------------------------------------------------
Total               55          75.647
--------------------------------------------------------------------


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



Corn dry weight (g), lbs ai/A; Day 21
File: 1927cw        Transform: NO TRANSFORMATION

       DUNNETTS TEST    -    TABLE 1 OF 2              Ho:Control<Treatment
--------------------------------------------------------------------
                        TRANSFORMED    MEAN CALCULATED IN
GROUP    IDENTIFICATION     MEAN        ORIGINAL UNITS      T STAT  SIG
--------------------------------------------------------------------
  1         neg control    4.075            4.075
  2            0.00311      4.108            4.108          -0.104
  3            0.00622      4.362            4.362          -0.886
  4            0.0125       4.323            4.323          -0.766
  5            0.0249       4.262            4.262          -0.577
  6            0.0498       2.628            2.628           4.465   *
  7            0.0944       1.620            1.620           7.576   *
--------------------------------------------------------------------
Dunnett table value =  2.37     (1 Tailed Value, P=0.05,  df=40,6)



Corn dry weight (g), lbs ai/A; Day 21
File: 1927cw        Transform: NO TRANSFORMATION

       DUNNETTS TEST    -    TABLE 2 OF 2              Ho:Control<Treatment
--------------------------------------------------------------------
                        NUM OF  Minimum Sig Diff  % of    DIFFERENCE
GROUP    IDENTIFICATION  REPS   (IN ORIG. UNITS)  CONTROL  FROM CONTROL
--------------------------------------------------------------------
  1         neg control   8
  2            0.00311     8        0.768          18.8      -0.034
  3            0.00622     8        0.768          18.8      -0.287
  4            0.0125      8        0.768          18.8      -0.248
  5            0.0249      8        0.768          18.8      -0.187
  6            0.0498      8        0.768          18.8       1.447
  7            0.0944      8        0.768          18.8       2.455
--------------------------------------------------------------------



Corn dry weight (g), lbs ai/A; Day 21
File: 1927cw        Transform: NO TRANSFORMATION
```

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```
        WILLIAMS TEST  (Isotonic regression model)    TABLE 1 OF 2
-----------------------------------------------------------------------------
GROUP                            ORIGINAL    TRANSFORMED    ISOTONIZED
           IDENTIFICATION   N      MEAN         MEAN          MEAN
------   --------------------  ---  --------   -----------   ----------
   1         neg control    8     4.075        4.075         4.226
   2            0.00311     8     4.108        4.108         4.226
   3            0.00622     8     4.362        4.362         4.226
   4            0.0125      8     4.323        4.323         4.226
   5            0.0249      8     4.262        4.262         4.226
   6            0.0498      8     2.628        2.628         2.628
   7            0.0944      8     1.620        1.620         1.620
-----------------------------------------------------------------------------



Corn dry weight (g), lbs ai/A; Day 21
File: 1927cw        Transform: NO TRANSFORMATION

        WILLIAMS TEST  (Isotonic regression model)    TABLE 2 OF 2
-----------------------------------------------------------------------------
                    ISOTONIZED   CALC.      SIG     TABLE      DEGREES OF
      IDENTIFICATION   MEAN      WILLIAMS   P=.05   WILLIAMS    FREEDOM
   --------------------  ----------  ----------  -----  ----------  ------------
        neg control    4.226
           0.00311     4.226      0.467              1.68       k= 1, v=49
           0.00622     4.226      0.467              1.76       k= 2, v=49
           0.0125      4.226      0.467              1.79       k= 3, v=49
           0.0249      4.226      0.467              1.80       k= 4, v=49
           0.0498      2.628      4.467       *      1.80       k= 5, v=49
           0.0944      1.620      7.580       *      1.81       k= 6, v=49
-----------------------------------------------------------------------------
s =    0.648
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          0.020      0.012     0.032        0.10       0.62
EC10         0.026      0.018     0.039        0.085      0.68
EC25         0.042      0.033     0.054        0.054      0.78
EC50         0.072      0.063     0.082        0.030      0.87

        Slope =    2.96  Std.Err. =    0.493


Goodness of fit: p =      0.21  based on DF=       4.0        49.
-----------------------------------------------------------------------------
1927CW : Corn dry weight (g), lbs ai/A; Day 21
-----------------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
-----------------------------------------------------------------------------
    Dose     #Reps.    Obs.     Pred.     Obs.     Pred.    %Change
                       Mean     Mean     -Pred.   %Control

    0.00      8.00     4.07     4.27     -0.196    100.       0.00
 0.00311      8.00     4.11     4.27     -0.163    100.     0.00272
 0.00622      8.00     4.36     4.27      0.0944    99.9    0.0832
 0.0125       8.00     4.32     4.22      0.104     98.8    1.23
 0.0249       8.00     4.26     3.90      0.362     91.3    8.69
```

Data Evaluation Report on the Acute Toxicity of AE 0317309 02 SE06 A102 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2446   **EPA MRID Number 468019-27**

```
      0.0498       8.00       2.63       2.91     -0.277      68.0       32.0
      0.0944       8.00       1.62       1.54      0.0758     36.1       63.9
```

Oat dry weight (g), lbs ai/A; Day 21
```
File: 1927ow          Transform: NO TRANSFORMATION
```

```
                              ANOVA TABLE
-------------------------------------------------------------------------

SOURCE               DF              SS                MS              F
-------------------------------------------------------------------------
Between               5            6.504             1.301         15.866

Within (Error)       42            3.440             0.082
-------------------------------------------------------------------------
Total                47            9.944
-------------------------------------------------------------------------


   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: 1927ow          Transform: NO TRANSFORMATION

      DUNNETTS TEST    -    TABLE 1 OF 2              Ho:Control<Treatment
-------------------------------------------------------------------------
                          TRANSFORMED     MEAN CALCULATED IN
GROUP    IDENTIFICATION      MEAN            ORIGINAL UNITS    T STAT  SIG
----- --------------      -----------    ------------------   ------  ---
  1         neg control     2.302              2.302
  2            0.00622      2.309              2.309           -0.051
  3            0.0125       2.174              2.174            0.892
  4            0.0249       2.075              2.075            1.581
  5            0.0498       1.729              1.729            3.997   *
  6            0.0944       1.279              1.279            7.145   *
-------------------------------------------------------------------------
Dunnett table value =   2.31      (1 Tailed Value, P=0.05,   df=40,5)
```

```
Oat dry weight (g), lbs ai/A; Day 21
File: 1927ow          Transform: NO TRANSFORMATION

      DUNNETTS TEST    -    TABLE 2 OF 2              Ho:Control<Treatment
-------------------------------------------------------------------------
                        NUM OF   Minimum Sig Diff   % of      DIFFERENCE
GROUP    IDENTIFICATION  REPS    (IN ORIG. UNITS)   CONTROL   FROM CONTROL
----- --------------    ------   ----------------   -------   -----------
  1         neg control   8
  2            0.00622    8           0.331           14.4       -0.007
  3            0.0125     8           0.331           14.4        0.128
  4            0.0249     8           0.331           14.4        0.226
  5            0.0498     8           0.331           14.4        0.572
  6            0.0944     8           0.331           14.4        1.023
-------------------------------------------------------------------------
```

```
Oat dry weight (g), lbs ai/A; Day 21
File: 1927ow          Transform: NO TRANSFORMATION
```

Data Evaluation Report on the Acute Toxicity of AE 0317309 02 SE06 A102 to Terrestrial Vascular Plants: Vegetative Vigor

```
            WILLIAMS TEST  (Isotonic regression model)    TABLE 1 OF 2
-----------------------------------------------------------------------------
GROUP                                  ORIGINAL     TRANSFORMED     ISOTONIZED
           IDENTIFICATION       N        MEAN          MEAN           MEAN
------    ----------------     ---    ----------    -----------    -----------
   1           neg control      8       2.302          2.302          2.305
   2               0.00622      8       2.309          2.309          2.305
   3               0.0125       8       2.174          2.174          2.174
   4               0.0249       8       2.075          2.075          2.075
   5               0.0498       8       1.729          1.729          1.729
   6               0.0944       8       1.279          1.279          1.279
-----------------------------------------------------------------------------


Oat dry weight (g), lbs ai/A; Day 21
File: 1927ow          Transform: NO TRANSFORMATION

          WILLIAMS TEST  (Isotonic regression model)    TABLE 2 OF 2
-----------------------------------------------------------------------------
                    ISOTONIZED   CALC.     SIG      TABLE       DEGREES OF
     IDENTIFICATION    MEAN     WILLIAMS   P=.05   WILLIAMS      FREEDOM
   ----------------- ---------- --------- ------- ----------- --------------
        neg control    2.305
            0.00622    2.305      0.025              1.68      k= 1, v=42
            0.0125     2.174      0.893              1.76      k= 2, v=42
            0.0249     2.075      1.582              1.79      k= 3, v=42
            0.0498     1.729      3.999      *       1.80      k= 4, v=42
            0.0944     1.279      7.149      *       1.80      k= 5, v=42
-----------------------------------------------------------------------------
s =     0.286
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           0.015      0.0070     0.034        0.17        0.45
EC10          0.024      0.013      0.044        0.13        0.54
EC25          0.050      0.036      0.069        0.071       0.72
EC50          0.11       0.088      0.14         0.053       0.78

        Slope =     1.91  Std.Err. =     0.424


Goodness of fit: p =      0.96  based on DF=      3.0        42.
-----------------------------------------------------------------------------
1927OW : Oat dry weight (g), lbs ai/A; Day 21
-----------------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
-----------------------------------------------------------------------------
    Dose      #Reps.     Obs.      Pred.      Obs.      Pred.    %Change
                         Mean      Mean      -Pred.    %Control

     0.00      8.00      2.30      2.30     0.00157     100.      0.00
  0.00622      8.00      2.31      2.28      0.0275      99.2     0.813
   0.0125      8.00      2.17      2.22     -0.0477      96.6     3.41
   0.0249      8.00      2.08      2.06      0.0178      89.5     10.5
   0.0498      8.00      1.73      1.73     0.00384      75.0     25.0
   0.0944      8.00      1.28      1.28    -0.00301      55.7     44.3
```

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

Data Evaluation Report on the Acute Toxicity of AE 0317309 02 SE06 A102 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2446   EPA MRID Number 468019-27

```
Onion dry weight (g), lbs ai/A; Day 21
File: 1927nw        Transform: NO TRANSFORMATION

                              ANOVA TABLE
------------------------------------------------------------------------

SOURCE              DF              SS              MS              F
------------------------------------------------------------------------
Between              6            0.0118          0.0020          10.000

Within (Error)      45            0.0075          0.0002

------------------------------------------------------------------------
Total               51            0.0193
------------------------------------------------------------------------


   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: 1927nw        Transform: NO TRANSFORMATION

      BONFERRONI T-TEST    -    TABLE 1 OF 2              Ho:Control<Treatment
------------------------------------------------------------------------
                         TRANSFORMED   MEAN CALCULATED IN
GROUP    IDENTIFICATION      MEAN        ORIGINAL UNITS    T STAT   SIG
-----  ------------------  -----------  ------------------  ------  ---
   1         neg control     0.050            0.050
   2            0.00311      0.067            0.067         -2.316
   3            0.00622      0.057            0.057         -1.008
   4            0.0125       0.051            0.051         -0.035
   5            0.0249       0.033            0.033          2.386
   6            0.0498       0.025            0.025          3.411    *
   7            0.0944       0.022            0.022          3.479    *
------------------------------------------------------------------------
Bonferroni T table value =  2.50     (1 Tailed Value, P=0.05,  df=40,6)



Onion dry weight (g), lbs ai/A; Day 21
File: 1927nw        Transform: NO TRANSFORMATION

      BONFERRONI T-TEST .  -    TABLE 2 OF 2              Ho:Control<Treatment
------------------------------------------------------------------------
                         NUM OF  Minimum Sig Diff  % of      DIFFERENCE
GROUP    IDENTIFICATION   REPS   (IN ORIG. UNITS)  CONTROL  FROM CONTROL
-----  ------------------  ------  ----------------  -------  ------------
   1         neg control    8
   2            0.00311     8           0.018         35.2      -0.016
   3            0.00622     8           0.018         35.2      -0.007
   4            0.0125      8           0.018         35.2      -0.000
   5            0.0249      8           0.018         35.2       0.017
   6            0.0498      7           0.018         36.4       0.025
   7            0.0944      5           0.020         40.1       0.028
------------------------------------------------------------------------



Onion dry weight (g), lbs ai/A; Day 21
File: 1927nw        Transform: NO TRANSFORMATION
```

```
           WILLIAMS TEST   (Isotonic regression model)    TABLE 1 OF 2
------------------------------------------------------------------------------
GROUP                               ORIGINAL     TRANSFORMED     ISOTONIZED
           IDENTIFICATION      N      MEAN          MEAN            MEAN
------     --------------     ---   --------     -----------     ----------
   1            neg control    8     0.050         0.050           0.058
   2                0.00311    8     0.067         0.067           0.058
   3                0.00622    8     0.057         0.057           0.057
   4                0.0125     8     0.051         0.051           0.051
   5                0.0249     8     0.033         0.033           0.033
   6                0.0498     7     0.025         0.025           0.025
   7                0.0944     5     0.022         0.022           0.022
------------------------------------------------------------------------------
```

```
Onion dry weight (g), lbs ai/A; Day 21
File: 1927nw          Transform: NO TRANSFORMATION

           WILLIAMS TEST   (Isotonic regression model)    TABLE 2 OF 2
------------------------------------------------------------------------------
                      ISOTONIZED   CALC.     SIG     TABLE      DEGREES OF
     IDENTIFICATION      MEAN     WILLIAMS  P=.05   WILLIAMS     FREEDOM
   ----------------   ----------  --------  -----  ----------  ------------
        neg control     0.058
            0.00311     0.058      1.256             1.68       k= 1, v=45
            0.00622     0.057      1.093             1.76       k= 2, v=45
            0.0125      0.051      0.038             1.79       k= 3, v=45
            0.0249      0.033      2.589      *       1.80       k= 4, v=45
            0.0498      0.025      3.700      *       1.80       k= 5, v=45
            0.0944      0.022      3.774      *       1.81       k= 6, v=45
------------------------------------------------------------------------------
s =    0.013
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           0.0041     0.0010    0.016         0.30       0.25
EC10          0.0069     0.0022    0.022         0.25       0.32
EC25          0.017      0.0078    0.036         0.16       0.47
EC50          0.044      0.029     0.068         0.092      0.65

        Slope =    1.59  Std.Err. =    0.381


!!!Poor fit: p =     0.034  based on DF=       4.0        45.
-----------------------------------------------------------------------
1927NW : Onion dry weight (g), lbs ai/A; Day 21
-----------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
-----------------------------------------------------------------------
    Dose      #Reps.     Obs.     Pred.      Obs.      Pred.    %Change
                         Mean     Mean      -Pred.    %Control

    0.00       8.00     0.0502   0.0595   -0.00928    100.       0.00
 0.00311       8.00     0.0666   0.0575    0.00909     96.7      3.34
 0.00622       8.00     0.0574   0.0543    0.00307     91.2      8.78
  0.0125       8.00     0.0505   0.0481    0.00235     80.9     19.1
  0.0249       8.00     0.0334   0.0390   -0.00561     65.5     34.5
  0.0498       7.00     0.0253   0.0279   -0.00261     46.9     53.1
```

Data Evaluation Report on the Acute Toxicity of AE 0317309 02 SE06 A102 to Terrestrial Vascular Plants: Vegetative Vigor

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```
     0.0944       5.00     0.0222      0.0180    0.00424        30.2        69.8
```

Onion % survival, lbs ai/A; Day 21
File: 1927ns   . Transform: NO TRANSFORMATION

```
                  KRUSKAL-WALLIS ANOVA BY RANKS   -   TABLE 1 OF 2
---------------------------------------------------------------------------
                              TRANSFORMED   MEAN CALCULATED IN      RANK
GROUP      IDENTIFICATION        MEAN         ORIGINAL UNITS         SUM
-----  --------------------   -----------   -------------------   ----------
   1           neg control    100.000               100.000       260.000
   2              0.00311     100.000               100.000       260.000
   3              0.00622     100.000               100.000       260.000
   4               0.0125     100.000               100.000       260.000
   5               0.0249     100.000               100.000       260.000
   6               0.0498     100.000               100.000       260.000
   7               0.0944      25.000                25.000        36.000
---------------------------------------------------------------------------

  Calculated H Value = 765.092       Critical H Value Table =  12.590
  Since  Calc H > Crit H   REJECT Ho:All groups are equal.
```

Onion % survival, lbs ai/A; Day 21
File: 1927ns   Transform: NO TRANSFORMATION

```
 DUNNS MULTIPLE COMPARISON -  KRUSKAL-WALLIS   -  TABLE 2 OF 2
-----------------------------------------------------------------------
                                                   GROUP
                      TRANSFORMED   ORIGINAL   0 0 0 0 0 0 0
GROUP   IDENTIFICATION    MEAN        MEAN     7 2 3 4 5 6 1
-----  ---------------  -----------  ---------  - - - - - - -
   7           0.0944      25.000      25.000   \
   2          0.00311     100.000     100.000   * \
   3          0.00622     100.000     100.000   * . \
   4           0.0125     100.000     100.000   * . . \
   5           0.0249     100.000     100.000   * . . . \
   6           0.0498     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 =    8.618
```

Ryegrass dry weight (g), lbs ai/A; Day 21
File: 1927gw   Transform: NO TRANSFORMATION

```
                              ANOVA TABLE
----------------------------------------------------------------------------

SOURCE           DF              SS                 MS              F
----------------------------------------------------------------------------
Between           5            0.252              0.050           4.167

Within (Error)   42            0.506              0.012

----------------------------------------------------------------------------
Total            47            0.758
----------------------------------------------------------------------------

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

Data Evaluation Report on the Acute Toxicity of AE 0317309 02 SE06 A102 to Terrestrial Vascular Plants: Vegetative Vigor

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```
Ryegrass dry weight (g), lbs ai/A; Day 21
File: 1927gw          Transform: NO TRANSFORMATION

        DUNNETTS TEST    -    TABLE 1 OF 2              Ho:Control<Treatment
------------------------------------------------------------------------------
                              TRANSFORMED    MEAN CALCULATED IN
GROUP     IDENTIFICATION        MEAN           ORIGINAL UNITS    T STAT   SIG
-----   ----------------     -----------    ------------------  ------   ---
  1           neg control      0.626              0.626
  2               0.00622      0.740              0.740         -2.084
  3               0.0125       0.656              0.656         -0.539
  4               0.0249       0.585              0.585          0.758
  5               0.0498       0.751              0.751         -2.287
  6               0.0944       0.559              0.559          1.221
------------------------------------------------------------------------------
Dunnett table value =  2.31      (1 Tailed Value, P=0.05,  df=40,5)
```

```
Ryegrass dry weight (g), lbs ai/A; Day 21
File: 1927gw          Transform: NO TRANSFORMATION

        DUNNETTS TEST    -    TABLE 2 OF 2              Ho:Control<Treatment
------------------------------------------------------------------------------
                             NUM OF   Minimum Sig Diff  % of     DIFFERENCE
GROUP     IDENTIFICATION     REPS     (IN ORIG. UNITS)  CONTROL  FROM CONTROL
-----   ----------------     ------   ----------------  -------  ------------
  1           neg control      8
  2               0.00622      8          0.127          20.2       -0.114
  3               0.0125       8          0.127          20.2       -0.029
  4               0.0249       8          0.127          20.2        0.042
  5               0.0498       8          0.127          20.2       -0.125
  6               0.0944       8          0.127          20.2        0.067
------------------------------------------------------------------------------
```

```
Ryegrass dry weight (g), lbs ai/A; Day 21
File: 1927gw          Transform: NO TRANSFORMATION

        WILLIAMS TEST   (Isotonic regression model)    TABLE 1 OF 2
------------------------------------------------------------------------------
GROUP                                ORIGINAL     TRANSFORMED   ISOTONIZED
          IDENTIFICATION      N       MEAN          MEAN          MEAN
------   ----------------    ---    ---------    -----------   -----------
  1           neg control      8      0.626         0.626         0.683
  2               0.00622      8      0.740         0.740         0.683
  3               0.0125       8      0.656         0.656         0.664
  4               0.0249       8      0.585         0.585         0.664
  5               0.0498       8      0.751         0.751         0.664
  6               0.0944       8      0.559         0.559         0.559
------------------------------------------------------------------------------
```

```
Ryegrass dry weight (g), lbs ai/A; Day 21
File: 1927gw          Transform: NO TRANSFORMATION

        WILLIAMS TEST   (Isotonic regression model)    TABLE 2 OF 2
------------------------------------------------------------------------------
                      ISOTONIZED    CALC.     SIG      TABLE     DEGREES OF
```

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IDENTIFICATION	MEAN	WILLIAMS	P=.05	WILLIAMS	FREEDOM
neg control	0.683				
0.00622	0.683	1.040		1.68	k= 1, v=42
0.0125	0.664	0.688		1.76	k= 2, v=42
0.0249	0.664	0.688		1.79	k= 3, v=42
0.0498	0.664	0.688		1.80	k= 4, v=42
0.0944	**0.559**	**1.218**		**1.80**	**k= 5, v=42**

s =   0.110
Note: df used for table values are approximate when v > 20.

Cucumber dry weight (g), lbs ai/A; Day 21
File: 1927uw   Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	17.927	2.988	15.402
Within (Error)	63	12.200	0.194	
Total	69	30.127		

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: 1927uw   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	2.991	2.991		
2	0.000199	3.452	3.452	-2.339	
3	0.000399	3.257	3.257	-1.350	
4	0.000797	3.047	3.047	-0.280	
5	0.00156	2.550	2.550	2.239	
6	0.00311	2.537	2.537	2.305	
7	0.00622	1.836	1.836	5.868	*

Dunnett table value = 2.35   (1 Tailed Value, P=0.05, df=60,6)

Cucumber dry weight (g), lbs ai/A; Day 21
File: 1927uw   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	10			
2	0.000199	10	0.463	15.5	-0.461
3	0.000399	10	0.463	15.5	-0.266

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```
    4               0.000797    10          0.463     15.5      -0.055
    5               0.00156     10          0.463     15.5       0.441
    6               0.00311     10          0.463     15.5       0.454
    7               0.00622     10          0.463     15.5       1.156
----------------------------------------------------------------------------
```

```
Cucumber dry weight (g), lbs ai/A; Day 21
File: 1927uw          Transform: NO TRANSFORMATION

            WILLIAMS TEST   (Isotonic regression model)    TABLE 1 OF 2
    ------------------------------------------------------------------------
    GROUP                             ORIGINAL    TRANSFORMED   ISOTONIZED
            IDENTIFICATION      N       MEAN        MEAN          MEAN
    ------  --------------     ---   ----------  -----------   ----------
      1           neg control  10      2.991        2.991        3.234
      2              0.000199  10      3.452        3.452        3.234
      3              0.000399  10      3.257        3.257        3.234
      4              0.000797  10      3.047        3.047        3.047
      5              0.00156   10      2.550        2.550        2.550
      6              0.00311   10      2.537        2.537        2.537
      7              0.00622   10      1.836        1.836        1.836
    ------------------------------------------------------------------------
```

```
Cucumber dry weight (g), lbs ai/A; Day 21
File: 1927uw          Transform: NO TRANSFORMATION

            WILLIAMS TEST   (Isotonic regression model)    TABLE 2 OF 2
    ------------------------------------------------------------------------
                     ISOTONIZED   CALC.      SIG     TABLE      DEGREES OF
        IDENTIFICATION    MEAN    WILLIAMS   P=.05   WILLIAMS    FREEDOM
    -------------------  --------- --------- ------  ---------  -----------
          neg control    3.234
             0.000199    3.234     1.231               1.67     k= 1, v=63
             0.000399    3.234     1.231               1.75     k= 2, v=63
             0.000797    3.047     0.280               1.77     k= 3, v=63
             0.00156     2.550     2.241      *         1.78     k= 4, v=63
             0.00311     2.537     2.307      *         1.79     k= 5, v=63
             0.00622     1.836     5.873      *         1.79     k= 6, v=63
    ------------------------------------------------------------------------
s =    0.440
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          0.00066   0.00024   0.0018       0.22        0.36
    EC10         0.0012    0.00053   0.0025       0.17        0.46
    EC25         0.0029    0.0020    0.0044       0.088       0.67
    EC50         0.0083    0.0059    0.012        0.074       0.71

          Slope =    1.49  Std.Err. =    0.341


!!!Poor fit: p =     0.047  based on DF=      4.0        63.
    ------------------------------------------------------------------------
1927UW : Cucumber dry weight (g), lbs ai/A; Day 21
    ------------------------------------------------------------------------
```

```
Observed vs. Predicted Treatment Group Means
-----------------------------------------------------------------------
    Dose      #Reps.     Obs.     Pred.     Obs.     Pred.    %Change
                         Mean     Mean     -Pred.   %Control

    0.00       10.0      2.99     3.24     -0.245    100.      0.00
 0.000199      10.0      3.45     3.21      0.241    99.2      0.774
 0.000399      10.0      3.26     3.16      0.100    97.6      2.44
 0.000797      10.0      3.05     3.03      0.0180   93.6      6.41
 0.00156       10.0      2.55     2.79     -0.237    86.1      13.9
 0.00311       10.0      2.54     2.39      0.147    73.9      26.1
 0.00622       10.0      1.84     1.86     -0.0258   57.5      42.5
```

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

Oilseed rape dry weight (g), lbs ai/A; Day 21
File: 1927dw   Transform: NO TRANSFORMATION

```
                           ANOVA TABLE
-----------------------------------------------------------------------

SOURCE            DF            SS            MS            F
-----------------------------------------------------------------------
Between            6          69.268        11.545        43.566

Within (Error)    49          13.002         0.265
-----------------------------------------------------------------------
Total             55          82.270
-----------------------------------------------------------------------
```

```
  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: 1927dw   Transform: NO TRANSFORMATION

```
       DUNNETTS TEST   -   TABLE 1 OF 2            Ho:Control<Treatment
-----------------------------------------------------------------------
                            TRANSFORMED   MEAN CALCULATED IN
GROUP    IDENTIFICATION        MEAN        ORIGINAL UNITS    T STAT  SIG
-----    --------------     -----------   -----------------  ------  ---
  1         neg control        3.698          3.698
  2            0.000199        3.632          3.632          0.254
  3            0.000399        3.459          3.459          0.925
  4            0.000797        3.426          3.426          1.054
  5            0.00156         2.793          2.793          3.517   *
  6            0.00311         1.521          1.521          8.457   *
  7            0.00622         0.626          0.626         11.932   *
-----------------------------------------------------------------------
Dunnett table value =  2.37     (1 Tailed Value, P=0.05,  df=40,6)
```

Oilseed rape dry weight (g), lbs ai/A; Day 21
File: 1927dw   Transform: NO TRANSFORMATION

```
       DUNNETTS TEST   -   TABLE 2 OF 2            Ho:Control<Treatment
-----------------------------------------------------------------------
                         NUM OF   Minimum Sig Diff   % of     DIFFERENCE
GROUP    IDENTIFICATION  REPS     (IN ORIG. UNITS)  CONTROL  FROM CONTROL
-----    --------------  ------   ----------------  -------  ------------
```

Data Evaluation Report on the Acute Toxicity of AE 0317309 02 SE06 A102 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2446   **EPA MRID Number 468019-27**

```
   1         neg control     8
   2            0.000199     8       0.610     16.5      0.065
   3            0.000399     8       0.610     16.5      0.238
   4            0.000797     8       0.610     16.5      0.271
   5            0.00156      8       0.610     16.5      0.905
   6            0.00311      8       0.610     16.5      2.177
   7            0.00622      8       0.610     16.5      3.071
   --------------------------------------------------------------------------
```

```
Oilseed rape dry weight (g), lbs ai/A; Day 21
File: 1927dw          Transform: NO TRANSFORMATION

        WILLIAMS TEST   (Isotonic regression model)    TABLE 1 OF 2
   ------------------------------------------------------------------------
   GROUP                              ORIGINAL    TRANSFORMED    ISOTONIZED
            IDENTIFICATION     N       MEAN         MEAN           MEAN
   ------   ------------------ ---   ----------   -----------   ----------
      1          neg control   8       3.698        3.698         3.698
      2             0.000199   8       3.632        3.632         3.632
      3             0.000399   8       3.459        3.459         3.459
      4             0.000797   8       3.426        3.426         3.426
      5             0.00156    8       2.793        2.793         2.793
      6             0.00311    8       1.521        1.521         1.521
      7             0.00622    8       0.626        0.626         0.626
   ------------------------------------------------------------------------
```

```
Oilseed rape dry weight (g), lbs ai/A; Day 21
File: 1927dw          Transform: NO TRANSFORMATION

        WILLIAMS TEST   (Isotonic regression model)    TABLE 2 OF 2
   ------------------------------------------------------------------------
                      ISOTONIZED   CALC.      SIG      TABLE      DEGREES OF
       IDENTIFICATION    MEAN      WILLIAMS   P=.05    WILLIAMS    FREEDOM
   ------------------  ----------  --------   -----    --------   ----------
          neg control   3.698
             0.000199   3.632      0.253                1.68      k= 1, v=49
             0.000399   3.459      0.925                1.76      k= 2, v=49
             0.000797   3.426      1.053                1.79      k= 3, v=49
             0.00156    2.793      3.514        *       1.80      k= 4, v=49
             0.00311    1.521      8.451        *       1.80      k= 5, v=49
             0.00622    0.626     11.924        *       1.81      k= 6, v=49
   ------------------------------------------------------------------------
s =    0.515
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         0.00068   0.00045   0.0010       0.089       0.66
EC10        0.00093   0.00065   0.0013       0.076       0.71
EC25        0.0015    0.0012    0.0020       0.054       0.78
EC50        0.0027    0.0023    0.0032       0.033       0.86

        Slope =     2.73  Std.Err. =    0.292


Goodness of fit: p =      0.89  based on DF=        4.0        49.
```

Data Evaluation Report on the Acute Toxicity of AE 0317309 02 SE06 A102 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2446   EPA MRID Number 468019-27

```
-----------------------------------------------------------------------
1927DW : Oilseed rape dry weight (g), lbs ai/A; Day 21
-----------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
-----------------------------------------------------------------------
      Dose      #Reps.      Obs.     Pred.      Obs.      Pred.     %Change
                            Mean     Mean      -Pred.    %Control

      0.00      8.00        3.70     3.64      0.0623    100.       0.00
   0.000199     8.00        3.63     3.63      0.000531   99.9      0.0955
   0.000399     8.00        3.46     3.59     -0.135      98.9      1.13
   0.000797     8.00        3.43     3.37      0.0526     92.8      7.20
    0.00156     8.00        2.79     2.72      0.0754     74.7      25.3
    0.00311     8.00        1.52     1.60     -0.0796     44.0      56.0
    0.00622     8.00        0.626    0.603     0.0236     16.6      83.4
```

Soybean dry weight (g), lbs ai/A; Day 21
File: 1927sw   Transform: NO TRANSFORMATION

ANOVA TABLE

```
---------------------------------------------------------------------------

SOURCE              DF              SS                MS              F
---------------------------------------------------------------------------

Between             6               15.232            2.539           90.679

Within (Error)     49               1.348             0.028
---------------------------------------------------------------------------

Total              55               16.580
---------------------------------------------------------------------------
```

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

Soybean dry weight (g), lbs ai/A; Day 21
File: 1927sw   Transform: NO TRANSFORMATION

```
        DUNNETTS TEST    -    TABLE 1 OF 2              Ho:Control<Treatment
---------------------------------------------------------------------------
                            TRANSFORMED    MEAN CALCULATED IN
GROUP      IDENTIFICATION       MEAN         ORIGINAL UNITS     T STAT    SIG
-----  --------------------  -----------  -------------------   ------    ---
  1           neg control       2.028           2.028
  2             0.000199        2.054           2.054          -0.315
  3             0.000399        1.989           1.989           0.459
  4             0.000797        1.909           1.909           1.416
  5              0.00156        1.583           1.583           5.317     *
  6              0.00311        1.045           1.045          11.751     *
  7              0.00622        0.621           0.621          16.817     *
---------------------------------------------------------------------------
Dunnett table value =  2.37      (1 Tailed Value, P=0.05,  df=40,6)
```

Soybean dry weight (g), lbs ai/A; Day 21
File: 1927sw   Transform: NO TRANSFORMATION

```
        DUNNETTS TEST    -    TABLE 2 OF 2              Ho:Control<Treatment
---------------------------------------------------------------------------
                            NUM OF    Minimum Sig Diff  % of      DIFFERENCE
GROUP      IDENTIFICATION    REPS     (IN ORIG. UNITS)  CONTROL   FROM CONTROL
```

Data Evaluation Report on the Acute Toxicity of AE 0317309 02 SE06 A102 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2446   EPA MRID Number 468019-27

```
----- -------------------- ------- ------------------ ------- ------------
 1           neg control    8
 2              0.000199    8           0.198          9.8       -0.026
 3              0.000399    8           0.198          9.8        0.038
 4              0.000797    8           0.198          9.8        0.119
 5              0.00156     8           0.198          9.8        0.445
 6              0.00311     8           0.198          9.8        0.983
 7              0.00622     8           0.198          9.8        1.407
----------------------------------------------------------------------------
```

```
Soybean dry weight (g), lbs ai/A; Day 21
File: 1927sw          Transform: NO TRANSFORMATION

        WILLIAMS TEST   (Isotonic regression model)    TABLE 1 OF 2
--------------------------------------------------------------------------
GROUP                                ORIGINAL    TRANSFORMED    ISOTONIZED
          IDENTIFICATION      N       MEAN          MEAN          MEAN
------- -------------------- --- ----------- ----------- -----------
 1           neg control     8      2.028        2.028         2.041
 2              0.000199     8      2.054        2.054         2.041
 3              0.000399     8      1.989        1.989         1.989
 4              0.000797     8      1.909        1.909         1.909
 5              0.00156      8      1.583        1.583         1.583
 6              0.00311      8      1.045        1.045         1.045
 7              0.00622      8      0.621        0.621         0.621
--------------------------------------------------------------------------
```

```
Soybean dry weight (g), lbs ai/A; Day 21
File: 1927sw          Transform: NO TRANSFORMATION

        WILLIAMS TEST   (Isotonic regression model)    TABLE 2 OF 2
--------------------------------------------------------------------------
                  ISOTONIZED   CALC.      SIG      TABLE      DEGREES OF
     IDENTIFICATION    MEAN     WILLIAMS  P=.05    WILLIAMS    FREEDOM
-------------------- ----------- --------- ----- ----------- -------------
     neg control      2.041
        0.000199      2.041      0.159               1.68     k= 1, v=49
        0.000399      1.989      0.463               1.76     k= 2, v=49
        0.000797      1.909      1.429               1.79     k= 3, v=49
        0.00156       1.583      5.363       *       1.80     k= 4, v=49
        0.00311       1.045     11.853       *       1.80     k= 5, v=49
        0.00622       0.621     16.963       *       1.81     k= 6, v=49
--------------------------------------------------------------------------
s =    0.166
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         0.00056   0.00039   0.00078        0.074      0.71
EC10        0.00083   0.00063   0.0011         0.061      0.75
EC25        0.0016    0.0013    0.0020         0.041      0.83
EC50        0.0034    0.0031    0.0038         0.023      0.90

        Slope =    2.09  Std.Err. =    0.160
```

Data Evaluation Report on the Acute Toxicity of AE 0317309 02 SE06 A102 to Terrestrial Vascular Plants: Vegetative Vigor

```
Goodness of fit: p =      0.69  based on DF=       4.0        49.
----------------------------------------------------------------------
1927SW : Soybean dry weight (g), lbs ai/A; Day 21
----------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
----------------------------------------------------------------------
    Dose      #Reps.     Obs.     Pred.     Obs.      Pred.    %Change
                         Mean     Mean     -Pred.    %Control

    0.00       8.00      2.03     2.06    -0.0283    100.       0.00
 0.000199      8.00      2.05     2.05     0.00839    99.5      0.500
 0.000399      8.00      1.99     2.00    -0.0134     97.4      2.59
 0.000797      8.00      1.91     1.86     0.0462     90.6      9.39
 0.00156       8.00      1.58     1.56     0.0190     76.1     23.9
 0.00311       8.00      1.04     1.10    -0.0511     53.3     46.7
 0.00622       8.00      0.621    0.601    0.0192     29.3     70.7
```

Sugar beet dry weight (g), lbs ai/A; Day 21
File: 1927bw   Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	29.541	4.924	153.875
Within (Error)	48	1.533	0.032	
Total	54	31.074		

```
  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: 1927bw   Transform: NO TRANSFORMATION

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

		TRANSFORMED	MEAN CALCULATED IN		
GROUP	IDENTIFICATION	MEAN	ORIGINAL UNITS	T STAT	SIG
1	neg control	2.111	2.111		
2	0.000199	2.209	2.209	-1.090	
3	0.000399	2.184	2.184	-0.818	
4	0.000797	1.881	1.881	2.577	*
5	0.00156	1.360	1.360	8.394	*
6	0.00311	0.630	0.630	16.558	*
7	0.00622	0.218	0.218	20.443	*

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

Sugar beet dry weight (g), lbs ai/A; Day 21
File: 1927bw   Transform: NO TRANSFORMATION

```
      BONFERRONI T-TEST    -    TABLE 2 OF 2            Ho:Control<Treatment
```
```
                        NUM OF   Minimum Sig Diff  % of    DIFFERENCE
```

```
GROUP    IDENTIFICATION    REPS    (IN ORIG. UNITS)  CONTROL  FROM CONTROL
-----   --------------------  -------  ----------------   -------  ------------
  1        neg control      8
  2          0.000199       8           0.224     10.6      -0.097
  3          0.000399       8           0.224     10.6      -0.073
  4          0.000797       8           0.224     10.6       0.231
  5          0.00156        8           0.224     10.6       0.751
  6          0.00311        8           0.224     10.6       1.481
  7          0.00622        7           0.231     11.0       1.893
-------------------------------------------------------------------------------
```

Sugar beet dry weight (g), lbs ai/A; Day 21
File: 1927bw   Transform: NO TRANSFORMATION

```
           WILLIAMS TEST  (Isotonic regression model)    TABLE 1 OF 2
-------------------------------------------------------------------------------
GROUP                              ORIGINAL    TRANSFORMED   ISOTONIZED
           IDENTIFICATION    N      MEAN         MEAN          MEAN
-------   --------------------  ---  -----------  -----------  -----------
  1        neg control      8      2.111        2.111        2.168
  2          0.000199       8      2.209        2.209        2.168
  3          0.000399       8      2.184        2.184        2.168
  4          0.000797       8      1.881        1.881        1.881
  5          0.00156        8      1.360        1.360        1.360
  6          0.00311        8      0.630        0.630        0.630
  7          0.00622        7      0.218        0.218        0.218
-------------------------------------------------------------------------------
```

Sugar beet dry weight (g), lbs ai/A; Day 21
File: 1927bw   Transform: NO TRANSFORMATION

```
           WILLIAMS TEST  (Isotonic regression model)    TABLE 2 OF 2
-------------------------------------------------------------------------------
                 ISOTONIZED   CALC.      SIG     TABLE       DEGREES OF
    IDENTIFICATION    MEAN      WILLIAMS   P=.05   WILLIAMS    FREEDOM
-------------------  -----------  -----------  -----  -----------  -----------
      neg control     2.168
        0.000199      2.168       0.636                1.68        k= 1, v=48
        0.000399      2.168       0.636                1.76        k= 2, v=48
        0.000797      1.881       2.579       *        1.79        k= 3, v=48
        0.00156       1.360       8.402       *        1.80        k= 4, v=48
        0.00311       0.630      16.574       *        1.80        k= 5, v=48
        0.00622       0.218      20.463       *        1.81        k= 6, v=48
-------------------------------------------------------------------------------
s =    0.179
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         0.00049   0.00037   0.00065     0.061       0.75
EC10        0.00067   0.00052   0.00085     0.053       0.78
EC25        0.0011    0.00094   0.0013      0.039       0.84
EC50        0.0020    0.0018    0.0022      0.025       0.89

        Slope =    2.68  Std.Err. =    0.183
```

Data Evaluation Report on the Acute Toxicity of AE 0317309 02 SE06 A102 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2446   **EPA MRID Number 468019-27**

```
Goodness of fit: p =        0.74  based on DF=        4.0         48.
------------------------------------------------------------------------
1927BW : Sugar beet dry weight (g), lbs ai/A; Day 21
------------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
------------------------------------------------------------------------
     Dose      #Reps.    Obs.    Pred.     Obs.     Pred.    %Change
                         Mean    Mean    -Pred.    %Control

     0.00      8.00      2.11    2.19   -0.0805    100.      0.00
  0.000199     8.00      2.21    2.18    0.0249    99.6      0.360
  0.000399     8.00      2.18    2.13    0.0589    97.0      3.03
  0.000797     8.00      1.88    1.88  0.000602    85.8      14.2
  0.00156      8.00      1.36    1.34    0.0164    61.3      38.7
  0.00311      8.00      0.630   0.664  -0.0335    30.3      69.7
  0.00622      7.00      0.218   0.203   0.0152    9.27      90.7
```

Sugar beet % survival, lbs ai/A; Day 21
File: 1927bs   Transform: NO TRANSFORMATION

```
              KRUSKAL-WALLIS ANOVA BY RANKS   -   TABLE 1 OF 2
-----------------------------------------------------------------------
                         TRANSFORMED    MEAN CALCULATED IN      RANK
GROUP    IDENTIFICATION     MEAN         ORIGINAL UNITS          SUM
-----  --------------   -----------   -------------------   -----------
  1       neg control    100.000            100.000          252.000
  2         0.000199     100.000            100.000          252.000
  3         0.000399     100.000            100.000          252.000
  4         0.000797     100.000            100.000          252.000
  5         0.00156      100.000            100.000          252.000
  6         0.00311      100.000            100.000          252.000
  7         0.00622       55.000             55.000           84.000
-----------------------------------------------------------------------

  Calculated H Value = 16.018       Critical H Value Table = 12.590
  Since  Calc H > Crit H  REJECT Ho:All groups are equal.
```

Sugar beet % survival, lbs ai/A; Day 21
File: 1927bs   Transform: NO TRANSFORMATION

```
DUNNS MULTIPLE COMPARISON -  KRUSKAL-WALLIS  -  TABLE 2 OF 2
-----------------------------------------------------------------------
                                              GROUP
                    TRANSFORMED  ORIGINAL   0 0 0 0 0 0 0
GROUP  IDENTIFICATION   MEAN       MEAN     7 2 3 4 5 6 1
-----  --------------  ----------- --------- - - - - - - -
  7        0.00622      55.000     55.000  \
  2        0.000199    100.000    100.000  . \
  3        0.000399    100.000    100.000  . . \
  4        0.000797    100.000    100.000  . . . \
  5        0.00156     100.000    100.000  . . . . \
  6        0.00311     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 =    8.295
```

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

Data Evaluation Report on the Acute Toxicity of AE 0317309 02 SE06 A102 to Terrestrial Vascular Plants: Vegetative Vigor

```
File: 1927fw        Transform: NO TRANSFORMATION

            KRUSKAL-WALLIS ANOVA BY RANKS  -  TABLE 1 OF 2
-----------------------------------------------------------------------
                            TRANSFORMED  MEAN CALCULATED IN     RANK
GROUP      IDENTIFICATION      MEAN        ORIGINAL UNITS        SUM
-----      --------------    ----------  -----------------   ----------
  1           neg control      1.243               1.243      432.000
  2             0.000199       1.273               1.273      477.500
  3             0.000399       1.247               1.247      430.000
  4             0.000797       1.238               1.238      442.000
  5             0.00156        1.222               1.222      419.500
  6             0.00311        0.866               0.866      229.000
  7             0.00622        0.251               0.251       55.000
-----------------------------------------------------------------------


  Calculated H Value =  34.836        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
File: 1927fw        Transform: NO TRANSFORMATION

 DUNNS MULTIPLE COMPARISON -  KRUSKAL-WALLIS  -  TABLE 2 OF 2
-----------------------------------------------------------------------
                                            GROUP
                  TRANSFORMED  ORIGINAL  0 0 0 0 0 0 0
GROUP  IDENTIFICATION  MEAN      MEAN    7 6 5 4 1 3 2
-----  --------------  --------  ------  - - - - - - -
  7         0.00622     0.251     0.251  \
  6         0.00311     0.866     0.866  . \
  5         0.00156     1.222     1.222  * . \
  4         0.000797    1.238     1.238  * . . \
  1       neg control   1.243     1.243  * . . . \
  3         0.000399    1.247     1.247  * . . . . \
  2         0.000199    1.273     1.273  * . . . . . \
-----------------------------------------------------------------------

* = significant difference (p=0.05)        . = no significant difference
Table q value (0.05,7) =   3.038           SE =     9.101

Estimates of EC%
-----------------------------------------------------------------------
Parameter   Estimate     95% Bounds       Std.Err.  Lower Bound
                       Lower    Upper                /Estimate
EC5          0.0017    0.0013   0.0023     0.061       0.75
EC10         0.0021    0.0016   0.0026     0.052       0.79
EC25         0.0029    0.0024   0.0034     0.037       0.84
EC50         0.0040    0.0036   0.0045     0.023       0.90

       Slope =    4.47  Std.Err. =    0.549


Goodness of fit: p =      1.0  based on DF=       4.0        63.
-----------------------------------------------------------------------
1927FW : Sunflower dry weight (g), lbs ai/A; Day 21
-----------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
-----------------------------------------------------------------------
    Dose      #Reps.    Obs.     Pred.      Obs.     Pred.    %Change
                        Mean     Mean      -Pred.   %Control
```

Data Evaluation Report on the Acute Toxicity of AE 0317309 02 SE06 A102 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2446   **EPA MRID Number 468019-27**

```
      0.00      10.0      1.24      1.25  -0.00980    100.       0.00
  0.000199      10.0      1.27      1.25   0.0208     100.    2.58e-07
  0.000399      10.0      1.25      1.25  -0.00530    100.    0.000354
  0.000797      10.0      1.24      1.25  -0.0138      99.9    0.0821
   0.00156      10.0      1.22      1.21   0.0104      96.7    3.25
   0.00311      10.0      0.865     0.868 -0.00287     69.3   30.7
   0.00622      10.0      0.251     0.251  0.000504    20.0   80.0
```

Tomato dry weight (g), lbs ai/A; Day 21
File: 1927tw   Transform: NO TRANSFORMATION

```
            KRUSKAL-WALLIS ANOVA BY RANKS   -   TABLE 1 OF 2
-------------------------------------------------------------------------
                            TRANSFORMED    MEAN CALCULATED IN     RANK
GROUP    IDENTIFICATION       MEAN          ORIGINAL UNITS        SUM
-----    --------------     -----------    -----------------    --------
  1         neg control      0.751              0.751           414.500
  2           0.000199       0.813              0.813           445.000
  3           0.000399       1.061              1.061           557.000
  4           0.000797       0.743              0.743           454.000
  5           0.00156        0.399              0.399           248.000
  6           0.00311        0.149              0.149            79.500
  7           0.00622        0.268              0.268           148.000
-------------------------------------------------------------------------

  Calculated H Value =  43.342      Critical H Value Table =  12.590
  Since  Calc H > Crit H  REJECT Ho:All groups are equal.
```

Tomato dry weight (g), lbs ai/A; Day 21
File: 1927tw   Transform: NO TRANSFORMATION

```
  DUNNS MULTIPLE COMPARISON -  KRUSKAL-WALLIS  -  TABLE 2 OF 2
---------------------------------------------------------------------
                                            GROUP
                    TRANSFORMED   ORIGINAL  0 0 0 0 0 0 0
GROUP   IDENTIFICATION  MEAN        MEAN    6 7 5 4 1 2 3
-----   --------------  ---------   -------- - - - - - - -
  6          0.00311     0.149       0.149   \
  7          0.00622     0.268       0.268   . \
  5          0.00156     0.399       0.399   . . \
  4          0.000797    0.743       0.743   * * . \
  1       neg control    0.751       0.751   * . . . \
  2          0.000199    0.813       0.813   * * . . . \
  3          0.000399    1.061       1.061   * * * . . . \
---------------------------------------------------------------------

* = 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
		Lower	Upper		/Estimate
EC5	0.00023	4.3E-05	0.0012	0.36	0.19
EC10	0.00037	8.9E-05	0.0015	0.31	0.24
EC25	0.00081	0.00029	0.0022	0.22	0.36
EC50	0.0019	0.0010	0.0036	0.14	0.54

Slope =   1.78 Std.Err. =   0.503

Data Evaluation Report on the Acute Toxicity of AE 0317309 02 SE06 A102 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2446   EPA MRID Number 468019-27

```
!!!Poor fit: p =    0.0022  based on DF=        4.0        61.
------------------------------------------------------------------------
1927TW : Tomato dry weight (g), lbs ai/A; Day 21
------------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
------------------------------------------------------------------------
     Dose       #Reps.      Obs.      Pred.      Obs.     Pred.   %Change
                            Mean      Mean      -Pred.   %Control

       0.00      10.0      0.751     0.890     -0.139    100.      0.00
   0.000199      10.0      0.813     0.855    -0.0417     96.1     3.94
   0.000399      10.0       1.06     0.791      0.271     88.8    11.2
   0.000797      10.0      0.743     0.670     0.0733     75.3    24.7
    0.00156      10.0      0.399     0.502     -0.103     56.4    43.6
    0.00311       9.00     0.149     0.316     -0.167     35.5    64.5
    0.00622       9.00     0.268     0.162      0.107     18.2    81.8
```

Tomato % survival, lbs ai/A; Day 21
File: 1927ts   Transform: NO TRANSFORMATION

```
              KRUSKAL-WALLIS ANOVA BY RANKS   -   TABLE 1 OF 2
----------------------------------------------------------------------
                               TRANSFORMED    MEAN CALCULATED IN    RANK
GROUP      IDENTIFICATION         MEAN         ORIGINAL UNITS        SUM
-----  --------------------    -----------    ------------------  ----------
  1             neg control    100.000            100.000         435.000
  2                0.000199    100.000            100.000         435.000
  3                0.000399    100.000            100.000         435.000
  4                0.000797    100.000            100.000         435.000
  5                 0.00156    100.000            100.000         435.000
  6                 0.00311     70.000             70.000         229.000
  7                 0.00622     45.000             45.000          81.000
----------------------------------------------------------------------

   Calculated H Value = -39.546        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: 1927ts   Transform: NO TRANSFORMATION

```
 DUNNS MULTIPLE COMPARISON -  KRUSKAL-WALLIS  -  TABLE 2 OF 2
----------------------------------------------------------------------
                                                     GROUP
                         TRANSFORMED   ORIGINAL   0 0 0 0 0 0 0
GROUP   IDENTIFICATION      MEAN         MEAN     7 6 3 4 5 1 2
-----  ---------------   -----------   --------   - - - - - - -
  7             0.00622     45.000      45.000    \
  6             0.00311     70.000      70.000    . \
  3            0.000399    100.000     100.000    * . \
  4            0.000797    100.000     100.000    * . . \
  5             0.00156    100.000     100.000    * . . . \
  1          neg control  100.000     100.000    * . . . . \
  2            0.000199    100.000     100.000    * . . . . . \
----------------------------------------------------------------------

* = significant difference (p=0.05)           . = no significant difference
Table q value (0.05,7) =   3.038              SE =    8.740

Estimates of EC%
```

Data Evaluation Report on the Acute Toxicity of AE 0317309 02 SE06 A102 to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number 2006-2446   **EPA MRID Number 468019-27**

```
---------------------------------------------------------------------
Parameter    Estimate     95% Bounds          Std.Err.  Lower Bound
                         Lower     Upper                 /Estimate
EC5            0.0013    0.00069   0.0025        0.14       0.53
EC10           0.0018    0.0011    0.0030        0.11       0.60
EC25           0.0030    0.0022    0.0041        0.066      0.74
EC50           0.0054    0.0045    0.0064        0.038      0.84

        Slope =    2.67  Std.Err. =    0.574


Goodness of fit: p =      0.76  based on DF=        4.0        63.
---------------------------------------------------------------------
1927TS : Tomato % survival, lbs ai/A; Day 21
---------------------------------------------------------------------
Observed vs. Predicted Treatment Group Means
---------------------------------------------------------------------
    Dose      #Reps.     Obs.     Pred.     Obs.      Pred.    %Change
                         Mean     Mean     -Pred.   %Control

     0.00      10.0      100.     101.     -1.12      100.      0.00
  0.000199     10.0      100.     101.     -1.12      100.      0.00654
  0.000399     10.0      100.     101.     -0.993     99.9      0.127
  0.000797     10.0      100.      99.8     0.228     98.7      1.34
  0.00156      10.0      100.      93.5     6.50      92.5      7.53
  0.00311      10.0       70.0     74.6    -4.62      73.8     26.2
  0.00622      10.0       45.0     43.9     1.13      43.4     56.6
```

Conversion of Study Authors' Toxicity Values

Oilseed Rape	kg product/ha	g ai/ha	lbs ai/A
EC25	0.038	1.7214	0.00151
Lower 95% C.I.	0.031	1.4043	0.00124
Upper 95% C.I.	0.044	1.9932	0.00175
EC50	0.067	3.0351	0.00267
Lower 95% C.I.	0.059	2.6727	0.00235
Upper 95% C.I.	0.076	3.4428	0.00303
Soybean			
EC25	0.043	1.9479	0.00171
Lower 95% C.I.	0.036	1.6308	0.00144
Upper 95% C.I.	0.049	2.2197	0.00195
EC50	0.087	3.9411	0.00347
Lower 95% C.I.	0.077	3.4881	0.00307
Upper 95% C.I.	0.099	4.4847	0.00395
Sugar beet			
EC25	0.031	1.4043	0.00124
Lower 95% C.I.	0.028	1.2684	0.00112
Upper 95% C.I.	0.033	1.4949	0.00132
EC50	0.052	2.3556	0.00207
Lower 95% C.I.	0.05	2.265	0.00199
Upper 95% C.I.	0.055	2.4915	0.00219
Sunflower			
EC25	0.073	3.3069	0.00291
Lower 95% C.I.	0.068	3.0804	0.00271
Upper 95% C.I.	0.077	3.4881	0.00307
EC50	0.102	4.6206	0.00407
Lower 95% C.I.	0.097	4.3941	0.00387
Upper 95% C.I.	0.107	4.8471	0.00427
Tomato			
EC25	0.027	1.2231	0.00108
Lower 95% C.I.	ND	ND	ND
Upper 95% C.I.	ND	ND	ND
EC50	0.054	2.4462	0.00215
Lower 95% C.I.	ND	ND	ND
Upper 95% C.I.	ND	ND	ND

Corn

EC25	0.994	45.0282	0.0396
Lower 95% C.I.	0.519	23.5107	0.0207
Upper 95% C.I.	1.313	59.4789	0.0523
EC50	1.742	78.9126	0.0694
Lower 95% C.I.	1.32	59.796	0.0526
Upper 95% C.I.	ND	ND	ND

Oat

EC25	1.269	57.4857	0.0506
Lower 95% C.I.	1.054	47.7462	0.0420
Upper 95% C.I.	1.472	66.6816	0.0587

Onion

EC25	0.637	28.8561	0.0254
Lower 95% C.I.	0.119	5.3907	0.00474
Upper 95% C.I.	1.061	48.0633	0.0423
EC50	1.567	70.9851	0.0625
Lower 95% C.I.	0.924	41.8572	0.0368
Upper 95% C.I.	ND	ND	ND

Corn Dry Weight (g)

	Negative Control	0.00311	0.00622	0.0125
Rep 1	4.641	4.491	3.719	4.140
Rep 2	1.025	4.881	4.105	5.137
Rep 3	3.987	4.231	4.955	4.127
Rep 4	4.708	3.834	4.575	4.262
Rep 5	4.490	3.965	4.072	4.264
Rep 6	4.962	4.382	4.549	4.190
Rep 7	3.907	3.360	4.099	4.578
Rep 8	4.877	3.722	4.821	3.884
Mean	4.075	4.108	4.362	4.323
% Reduction	N/A	-1	-7	-6

0.0249	0.0498	0.0944
4.626	2.150	1.917
3.815	2.978	2.025
4.149	2.633	1.765
4.999	2.351	1.610
3.337	2.281	1.502
3.468	2.584	1.209
4.542	2.918	1.063
5.157	3.128	1.867
4.262	*2.628*	*1.620*
-5	*36*	*60*

```
Corn dry weight (g), lbs ai/A; Day 21
7
8
8
8
8
8
8
8
neg control
4.64100000
1.02500000
3.98700000
4.70800000
4.49000000
4.96200000
3.90700000
4.87700000
0.00311
4.49100000
4.88100000
4.23100000
3.83400000
3.96500000
4.38200000
3.36000000
3.72200000
0.00622
3.71900000
4.10500000
4.95500000
4.57500000
4.07200000
4.54900000
4.09900000
4.82100000
0.0125
4.14000000
5.13700000
4.12700000
4.26200000
4.26400000
4.19000000
4.57800000
3.88400000
0.0249
4.62600000
3.81500000
4.14900000
4.99900000
3.33700000
3.468
4.54200000
5.15700000
0.0498
2.15000000
2.97800000
```

2.63300000
2.35100000
2.28100000
2.58400000
2.91800000
3.12800000
0.0944
1.91700000
2.02500000
1.76500000
1.61000000
1.50200000
1.20900000
1.06300000
1.86700000

Cucumber Percent Survival

Application Rate (lbs ai/A)

	# Survived	% Survival	Survival % Red.
Negative Control			
Rep 1	4	100	
Rep 2	4	100	
Rep 3	4	100	
Rep 4	4	100	
Rep 5	4	100	
Rep 6	4	100	
Rep 7	4	100	
Rep 8	4	100	
Rep 9	4	100	
Rep 10	4	100	
Mean		*100*	*N/A*
0.000199			
Rep 1	4	100	
Rep 2	4	100	
Rep 3	4	100	
Rep 4	4	100	
Rep 5	4	100	
Rep 6	4	100	
Rep 7	4	100	
Rep 8	4	100	
Rep 9	4	100	
Rep 10	4	100	
Mean		*100*	*0*
0.000399			
Rep 1	4	100	
Rep 2	4	100	
Rep 3	4	100	
Rep 4	4	100	
Rep 5	4	100	
Rep 6	4	100	
Rep 7	4	100	
Rep 8	4	100	
Rep 9	4	100	
Rep 10	4	100	
Mean		*100*	*0*
0.000797			
Rep 1	4	100	
Rep 2	4	100	
Rep 3	4	100	
Rep 4	4	100	
Rep 5	4	100	
Rep 6	4	100	
Rep 7	4	100	
Rep 8	4	100	
Rep 9	4	100	

Rep 10	4	100	
Mean		*100*	*0*
0.00156			
Rep 1	4	100	
Rep 2	4	100	
Rep 3	4	100	
Rep 4	4	100	
Rep 5	4	100	
Rep 6	4	100	
Rep 7	4	100	
Rep 8	4	100	
Rep 9	4	100	
Rep 10	4	100	
Mean		*100*	*0*
0.00311			
Rep 1	4	100	
Rep 2	4	100	
Rep 3	4	100	
Rep 4	4	100	
Rep 5	4	100	
Rep 6	4	100	
Rep 7	4	100	
Rep 8	4	100	
Rep 9	4	100	
Rep 10	4	100	
Mean		*100*	*0*
0.00622			
Rep 1	4	100	
Rep 2	4	100	
Rep 3	4	100	
Rep 4	4	100	
Rep 5	4	100	
Rep 6	4	100	
Rep 7	4	100	
Rep 8	4	100	
Rep 9	4	100	
Rep 10	4	100	
Mean		*100*	*0*

Cucumber dry weight (g), lbs ai/A; Day 21
7
10
10
10
10
10
10
10
neg control
3.654
3.456
3.397
3.276
3.282
2.922
2.106
3.121
3.232
1.467
0.000199
2.952
3.694
3.864
3.439
2.957
3.720
3.808
3.982
2.615
3.490
0.000399
3.683
2.726
3.986
2.197
3.229
3.269
3.577
3.394
3.481
3.031
0.000797
3.364
2.962
2.891
3.154
2.640
3.091
2.899
3.266
2.945
3.253
0.00156
2.329
2.286
2.928

2.784
2.607
2.904
2.107
2.336
2.979
2.243
0.00311
2.199
2.669
2.178
2.087
2.320
2.672
2.838
2.601
2.717
3.091
0.00622
1.082
2.303
1.871
2.093
1.708
2.023
1.393
2.326
1.589
1.967

Nominal Application Rates

kg product/ha	g ai/ha	
Negative Control	Negative Control	x 0.0022 lb/g
0.005	0.227	x 0.0022 lb/g
0.010	0.453	x 0.0022 lb/g
0.020	0.906	x 0.0022 lb/g
0.039	1.77	x 0.0022 lb/g
0.078	3.53	x 0.0022 lb/g
0.156	7.07	x 0.0022 lb/g
0.313	14.2	x 0.0022 lb/g
0.625	28.3	x 0.0022 lb/g
1.25	56.6	x 0.0022 lb/g
2.5	113	x 0.0022 lb/g

		lbs ai/A
0	x 0.4 ha/A	0
0.000498	x 0.4 ha/A	**0.000199**
0.000997	x 0.4 ha/A	**0.000399**
0.00199	x 0.4 ha/A	**0.000797**
0.00389	x 0.4 ha/A	**0.00156**
0.00777	x 0.4 ha/A	**0.00311**
0.0156	x 0.4 ha/A	**0.00622**
0.0312	x 0.4 ha/A	**0.0125**
0.0623	x 0.4 ha/A	**0.0249**
0.125	x 0.4 ha/A	**0.0498**
0.249	x 0.4 ha/A	**0.0994**

Oat Dry Weight (g)

	Negative Control	0.00622	0.0125	0.0249	0.0498
Rep 1	2.361	2.218	2.224	1.974	2.032
Rep 2	1.720	2.417	2.689	2.189	2.096
Rep 3	2.643	2.353	2.400	1.423	1.568
Rep 4	2.173	2.456	1.775	2.358	1.153
Rep 5	2.637	2.430	2.213	2.590	2.048
Rep 6	2.330	2.280	2.214	1.917	1.724
Rep 7	2.598	2.306	2.123	2.003	1.686
Rep 8	1.952	2.012	1.754	2.149	1.529
Mean	2.302	2.309	2.174	2.075	1.730
% Reduction	N/A	0	6	10	25

0.0944
1.204
1.190
1.413
1.149
1.433
1.055
1.139
1.647
1.279
44

```
Oat dry weight (g), lbs ai/A; Day 21
6
8
8
8
8
8
8
neg control
2.361
1.720
2.643
2.173
2.637
2.330
2.598
1.952
0.00622
2.218
2.417
2.353
2.456
2.430
2.280
2.306
2.012
0.0125
2.224
2.689
2.400
1.775
2.213
2.214
2.123
1.754
0.0249
1.974
2.189
1.423
2.358
2.590
1.917
2.003
2.149
0.0498
2.032
2.096
1.568
1.153
2.048
1.724
1.686
1.529
0.0944
1.204
1.190
1.413
```

1.149
1.433
1.055
1.139
1.647

Oilseed rape dry weight (g), lbs ai/A; Day 21
7
8
8
8
8
8
8
8
neg control
3.70000000
3.07400000
3.71300000
4.24000000
4.09600000
2.91600000
3.93800000
3.90400000
0.000199
3.98200000
1.56300000
3.71900000
4.05500000
3.90100000
4.15400000
3.59200000
4.09300000
0.000399
3.639
3.84400000
3.46300000
3.21900000
3.36800000
3.30700000
3.10700000
3.72900000
0.000797
3.37700000
2.69800000
3.34400000
3.76500000
4.16600000
3.96900000
3.89100000
2.20100000
0.00156
2.22500000
3.45300000
2.81900000
3.00700000
2.90700000
2.67200000
2.88000000
2.37700000
0.00311
1.39900000
1.45500000

```
1.68000000
1.67000000
1.87700000
0.69200000
1.79100000
1.60300000
0.00622
0.83000000
0.72800000
1.24000000
0.35400000
0.53600000
0.29500000
0.48700000
0.54100000
```

Oilsee rape Percent Emergence and
Survival

Application Rate (lbs ai/A)

	# Survived	% Survival	Survival % Red.
Negative Control			
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*	*N/A*
0.000199			
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*
0.000399			
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*
0.000797			
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*
0.00156			
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
0.00311			
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
0.00622			
Rep 1	5	100	
Rep 2	3	60	
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		95	5

Onion Percent Survival

Application Rate (lbs ai/A)

	# Survived	% Survival	Survival % Red.
Negative Control			
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*	*N/A*
0.00311			
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*
0.00622			
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*
0.0125			
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*
0.0249			
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
0.0498			
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
0.0994			
Rep 1	3	60	
Rep 2	0	0	
Rep 3	0	0	
Rep 4	2	40	
Rep 5	1	20	
Rep 6	0	0	
Rep 7	3	60	
Rep 8	1	20	
Mean		25	75

Onion % survival, lbs ai/A; Day 21
7
8
8
8
8
8
8
8
neg control
100
100
100
100
100
100
100
100
0.00311
100
100
100
100
100
100
100
100
0.00622
100
100
100
100
100
100
100
100
0.0125
100
100
100
100
100
100
100
100
0.0249
100
100
100
100
100
100
100
100
0.0498
100
100

100
100
100
100
100
100
0.0944
60
0
0
40
20
0
60
20

Onion dry weight (g), lbs ai/A; Day 21
7
8
8
8
8
8
7
5
neg control
0.048
0.053
0.049
0.074
0.055
0.043
0.043
0.037
0.00311
0.064
0.058
0.072
0.058
0.050
0.049
0.091
0.091
0.00622
0.093
0.058
0.053
0.062
0.053
0.045
0.043
0.052
0.0125
0.038
0.091
0.035
0.045
0.050
0.054
0.048
0.043
0.0249
0.031
0.034
0.029
0.036
0.023
0.039
0.032
0.043
0.0498
0.024
0.020

0.022
0.042
0.031
0.017
0.021
0.0944
0.023
0.022
0.029
0.020
0.017

Ryegrass Percent Survival

Application Rate (lbs ai/A)

	# Survived	% Survival	Survival % Red.
Negative Control			
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*	*N/A*
0.00622			
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*
0.0125			
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*
0.0249			
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*
0.0498			
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*
0.0994			
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*

Ryegrass dry weight (g), lbs ai/A; Day 21
6
8
8
8
8
8
8
neg control
0.541
0.572
0.555
0.694
0.846
0.500
0.499
0.802
0.00622
0.681
0.883
0.665
0.509
0.767
0.954
0.795
0.668
0.0125
0.762
0.770
0.566
0.629
0.609
0.620
0.650
0.639
0.0249
0.570
0.428
0.599
0.558
0.706
0.560
0.486
0.770
0.0498
0.660
0.930
0.666
0.700
0.750
0.720
0.792
0.793
0.0944
0.495
0.536
0.513

0.477
0.592
0.768
0.514
0.579

Soybean Percent Emergence and
Survival

Application Rate (lbs ai/A)

	# Survived	% Survival	Survival % Red.
Negative Control			
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*	*N/A*
0.000199			
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*
0.000399			
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*
0.000797			
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*
0.00156			
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*
0.00311			
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*
0.00622			
Rep 1	5	100	
Rep 2	5	100	
Rep 3	5	100	
Rep 4	4	80	
Rep 5	5	100	
Rep 6	5	100	
Rep 7	5	100	
Rep 8	5	100	
Mean		*98*	*3*

Soybean dry weight (g), lbs ai/A; Day 21
7
8
8
8
8
8
8
8

neg control
1.840
1.926
2.304
2.137
2.104
1.863
2.195
1.852
0.000199
1.727
2.011
2.178
2.233
2.172
2.189
1.867
2.055
0.000399
1.965
2.281
1.997
1.590
2.214
2.039
1.946
1.882
0.000797
1.787
1.815
2.023
1.689
1.728
1.948
2.107
2.176
0.00156
1.524
1.711
1.670
1.353
1.349
1.821
1.552
1.682
0.00311
1.004
0.972

```
1.001
1.120
0.926
1.203
1.111
1.019
0.00622
0.615
0.580
0.447
0.757
0.745
0.513
0.746
0.562
```

Sugar beet Dry Weight (g)

	Negative Control	0.000199	0.000399	0.000797
Rep 1	2.136	2.156	2.026	1.853
Rep 2	1.882	2.139	1.935	1.606
Rep 3	2.079	2.146	2.259	1.886
Rep 4	2.066	2.242	2.162	2.140
Rep 5	2.266	2.356	2.227	1.804
Rep 6	2.187	2.215	2.229	1.912
Rep 7	1.896	2.199	2.419	1.905
Rep 8	2.377	2.216	2.217	1.939
Mean	2.111	2.209	2.184	1.881
% Reduction	N/A	-5	-3	11

0.00156	0.00311	0.00622
1.176	0.639	0.207
1.828	0.410	0.343
1.192	0.901	0.196
1.253	0.254	0.102
1.251	0.800	0.089
1.240	0.857	0.328
1.129	0.556	
1.814	0.624	0.264
1.360	*0.630*	*0.218*
36	*70*	*90*

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
0.000199
100
100
100
100
100
100
100
100
0.000399
100
100
100
100
100
100
100
100
0.000797
100
100
100
100
100
100
100
100
0.00156
100
100
100
100
100
100
100
100
0.00311
100
100

```
100
100
100
100
100
100
0.00622
80
100
80
20
20
40
0
100
```

Sugar beet dry weight (g), lbs ai/A; Day 21
7
8
8
8
8
8
8
7

neg control
2.136
1.882
2.079
2.066
2.266
2.187
1.896
2.377
0.000199
2.156
2.139
2.146
2.242
2.356
2.215
2.199
2.216
0.000399
2.026
1.935
2.259
2.162
2.227
2.229
2.419
2.217
0.000797
1.853
1.606
1.886
2.140
1.804
1.912
1.905
1.939
0.00156
1.176
1.828
1.192
1.253
1.251
1.240
1.129
1.814
0.00311
0.639
0.410

0.901
0.254
0.800
0.857
0.556
0.624
0.00622
0.207
0.343
0.196
0.102
0.089
0.328
0.264

Sunflower Dry Weight (g)

	Negative Control	0.000199	0.000399	0.000797
Rep 1	0.965	1.113	1.208	0.834
Rep 2	1.627	1.278	1.067	1.499
Rep 3	1.608	1.242	1.367	1.606
Rep 4	1.195	1.318	0.812	1.271
Rep 5	1.077	1.303	1.192	1.356
Rep 6	1.269	1.241	1.297	1.151
Rep 7	0.939	1.275	1.222	0.822
Rep 8	1.012	1.323	1.613	1.137
Rep 9	1.385	1.303	1.668	1.246
Rep 10	1.349	1.336	1.025	1.454
Mean	1.243	1.273	1.247	1.238
% Reduction	N/A	-2	0	0
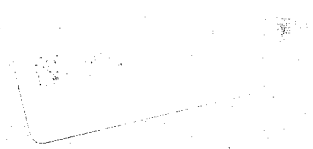
0.00156	0.00311	0.00622
1.322	0.860	0.221
0.796	0.594	0.223
1.449	1.210	0.246
1.097	0.829	0.238
1.172	0.714	0.379
1.241	0.709	0.375
1.179	0.485	0.203
1.453	0.779	0.197
1.503	1.199	0.142
1.009	1.276	0.296
1.222	*0.866*	*0.252*
2	*30*	*80*

Sunflower dry weight (g), lbs ai/A; Day 21
7
10
10
10
10
10
10
10
neg control
0.965
1.627
1.608
1.195
1.077
1.269
0.939
1.012
1.385
1.349
0.000199
1.113
1.278
1.242
1.318
1.303
1.241
1.275
1.323
1.303
1.336
0.000399
1.208
1.067
1.367
0.812
1.192
1.297
1.222
1.613
1.668
1.025
0.000797
0.834
1.499
1.606
1.271
1.356
1.151
0.822
1.137
1.246
1.454
0.00156
1.322
0.796
1.449

1.097
1.172
1.241
1.179
1.453
1.503
1.009
0.00311
0.860
0.594
1.210
0.829
0.714
0.709
0.485
0.779
1.199
1.276
0.00622
0.221
0.223
0.246
0.238
0.374
0.375
0.203
0.197
0.142
0.296

Tomato Percent Survival

Application Rate (lbs ai/A)

	# Survived	% Survival	Survival % Red.
Negative Control			
Rep 1	4	100	
Rep 2	4	100	
Rep 3	4	100	
Rep 4	4	100	
Rep 5	4	100	
Rep 6	4	100	
Rep 7	4	100	
Rep 8	4	100	
Rep 9	4	100	
Rep 10	4	100	
Mean		*100*	*N/A*
0.000199			
Rep 1	4	100	
Rep 2	4	100	
Rep 3	4	100	
Rep 4	4	100	
Rep 5	4	100	
Rep 6	4	100	
Rep 7	4	100	
Rep 8	4	100	
Rep 9	4	100	
Rep 10	4	100	
Mean		*100*	*0*
0.000399			
Rep 1	4	100	
Rep 2	4	100	
Rep 3	4	100	
Rep 4	4	100	
Rep 5	4	100	
Rep 6	4	100	
Rep 7	4	100	
Rep 8	4	100	
Rep 9	4	100	
Rep 10	4	100	
Mean		*100*	*0*
0.000797			
Rep 1	4	100	
Rep 2	4	100	
Rep 3	4	100	
Rep 4	4	100	
Rep 5	4	100	
Rep 6	4	100	
Rep 7	4	100	
Rep 8	4	100	
Rep 9	4	100	

Rep 10	4	100	
Mean		*100*	*0*
0.00156			
Rep 1	4	100	
Rep 2	4	100	
Rep 3	4	100	
Rep 4	4	100	
Rep 5	4	100	
Rep 6	4	100	
Rep 7	4	100	
Rep 8	4	100	
Rep 9	4	100	
Rep 10	4	100	
Mean		*100*	*0*
0.00311			
Rep 1	2	50	
Rep 2	3	75	
Rep 3	2	50	
Rep 4	0	0	
Rep 5	2	50	
Rep 6	4	100	
Rep 7	3	75	
Rep 8	4	100	
Rep 9	4	100	
Rep 10	4	100	
Mean		*70*	*30*
0.00622			
Rep 1	2	50	
Rep 2	2	50	
Rep 3	3	75	
Rep 4	3	75	
Rep 5	0	0	
Rep 6	1	25	
Rep 7	2	50	
Rep 8	1	25	
Rep 9	1	25	
Rep 10	3	75	
Mean		*45*	*55*

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
0.000199
100
100
100
100
100
100
100
100
100
100
0.000399
100
100
100
100
100
100
100
100
100
100
0.000797
100
100
100
100
100
100
100
100
100
100
0.00156
100
100
100

```
100
100
100
100
100
100
100
0.00311
50
75
50
0
50
100
75
100
100
100
0.00622
50
50
75
75
0
25
50
25
25
75
```

Tomato dry weight (g), lbs ai/A; Day 21
7
10
10
10
10
10
9
9
neg control
0.818
0.565
0.567
0.587
0.630
0.468
0.843
2.039
0.257
0.733
0.000199
1.108
0.440
0.683
0.377
0.352
0.877
1.841
1.002
0.681
0.770
0.000399
1.152
1.079
1.719
1.424
0.956
0.698
0.824
1.440
0.640
0.680
0.000797
0.501
0.460
0.663
0.885
0.483
0.980
1.041
0.747
1.033
0.636
0.00156
0.453
0.378
0.468

0.492
0.570
0.503
0.396
0.207
0.106
0.416
0.00311
0.207
0.103
0.132
0.135
0.099
0.093
0.132
0.202
0.236
0.00622
0.130
0.020
0.115
0.136
0.709
0.192
0.400
0.318
0.394