

Record

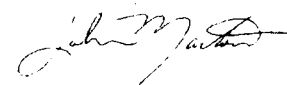
Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....} **EPA MRID Number 465789-41**

Data Requirement: PMRA Data Code: 9.8.4 (TGAI) or 9.8.6 (EP)
EPA DP Barcode: D319377
OECD Data Point: IIA 8.12 (TGAI) and IIIA 10.8.1.1 (EP)
EPA Guideline: 850.4100 and 850.4225

Test material: IR5878 50WG **Purity:** 49.96%
Common name: Orthosulfamuron
Chemical name: IUPAC: Not reported
CAS name: Not reported
CAS No.: Not reported
Synonyms: Not reported

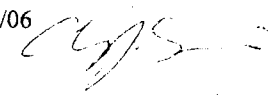
Primary Reviewer: John Marton
Staff Scientist, Cambridge Environmental, Inc.

Signature: 
Date: 3/13/06

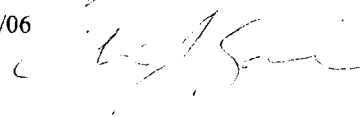
Secondary Reviewer: Teri S. Myers
Senior Scientist, Cambridge Environmental Inc.

Signature: 
Date: 3/21/06

Primary Reviewer: Christopher Salice
EPA/OPP/EFED/ERB - IV

Date: 6/30/06


Secondary Reviewer(s): Christopher J. Salice
EPA/OPP/EFED/ERB - IV

Date: 7/31/06


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

Company Code {.....} [For PMRA]
Active Code {.....} [For PMRA]
Use Site Category: {.....} [For PMRA]
EPA PC Code 108209

Date Evaluation Completed: 31-07-2006

CITATION: Porch, John R., K. H. Martin and H. O. Krueger. 2003. IR5878 50WG: A Toxicity Test to Determine the Effects on Seedling Emergence of Ten Species of Plants. Performed by Wildlife International, Ltd., Easton, MD. Laboratory study number 544-110. Sponsored by ISAGRO S.p.A., Milano, Italy. Study completed on October 27, 2003.

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



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EXECUTIVE SUMMARY:

The effects of IR5878 50WG (formulation with the active ingredient Orthosulfamuron) on seedling emergence of monocot (onion, *Allium cepa*; oat, *Avena sativa*; rice, *Oryza sativa* and corn, *Zea mays*) and dicot (carrot, *Daucus carota*; oilseed rape, *Brassica napus*; soybean, *Glycine max*; mung bean, *Phaseolus aureus*; pea, *Pisum sativum* and radish, *Raphanus sativus*) crops were studied at nominal concentrations of 0 (negative and adjuvant controls), 0.00163, 0.00489, 0.0147, 0.0440 and 0.132 lbs ai/A. Mean-measured concentrations were <0.5 ppb a.i. (controls), 0.00174, 0.00517, 0.0150, 0.0436 and 0.135 lbs ai/A. The growth medium used in the test was a sandy loam soil composed of kaolinite clay, industrial quartz sand and peat mixed in a 4:50:2 ratio (w:w:w). The pH was measured to be 7.3 and the organic matter content was determined to be 2.0%. On day 21, the surviving plants per pot were recorded and cut at soil level for measuring the plant height and dry weight. Emergence was determined on Days 7, 14 and 21.

In the seedling emergence test, dry weight and plant height were affected by treatment with IR5878 50WG (formulation with the active ingredient Orthosulfamuron) for rice, carrot, pea, and radish; dry weight was impacted to a greater extent in number of species affected and magnitude of effect, compared to plant height. The % inhibition in seedling emergence in the treated species as compared to the control ranged from 60 to 100%. There was no effect on percent survival. The most sensitive monocot species in the seedling emergence test was rice with a dry weight EC₂₅ of 0.078 lbs ai/A. The most sensitive dicot species was radish with a dry weight EC₂₅ of 0.040 lbs ai/A. The NOAEC based on radish dry weight, the most sensitive endpoint in the study, was 0.0147 lbs ai/A.

The study authors reported that the occasional signs of phytotoxicity did not appear to be dose-responsive and were generally not severe. Additionally, some mortality was observed during the test but, like the signs of phytotoxicity, there was no apparent dose-response.

Maximum Labeled Rate: Not reported

Results Synopsis

	Seedling Emergence Value:	95% C.I.
<u>Monocot:</u>		
Most sensitive monocot: Rice		
Most sensitive parameter: Dry Weight		
EC ₅₀ /IC ₅₀ :	0.15 lbs ai/A	0.083-0.28 lbs ai/A
EC ₂₅ /IC ₂₅ :	0.078 lbs ai/A	0.031-0.20 lbs ai/A
NOAEC:	0.0436 lbs ai/A	
Probit slope:	2.34±1.66	
 <u>Dicot:</u>		
Most sensitive dicot: Radish		
Most sensitive parameter: Dry Weight		
EC ₅₀ /IC ₅₀ :	0.072 lbs ai/A	0.060-0.088 lbs ai/A
EC ₂₅ /IC ₂₅ :	0.040 lbs ai/A	0.029-0.055 lbs ai/A
NOAEC:	0.0150 lbs ai/A	
Probit slope:	2.63±0.355	

This toxicity study is classified as ACCEPTABLE and satisfies the guideline requirement for a terrestrial plant seedling emergence toxicity study.

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Table 1. Endpoint summary by species, in lbs ai/A

Species	Endpoint	NOAEC	EC ₂₅	EC ₅₀
Corn	None	0.135	>0.135	>0.135
Oat	None	0.135	>0.135	>0.135
Onion	Dry Weight and Height	0.0436	>0.135	>0.135
Rice	Dry Weight	0.0150	0.078	0.15
Carrot	Dry Weight	0.0436	0.097	>0.135
Mung Bean	None	0.135	>0.135	>0.135
Oilseed Rape	None	0.135	>0.135	>0.135
Pea	Dry Weight	0.0150	0.093	>0.135
Radish	Dry Weight	0.0150	0.040	0.072
Soybean	Dry Weight	0.00517	>0.135	>0.135

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: Study procedures followed guidelines outlined in U.S. EPA Series 850-Ecological Effects Test Guidelines (draft) OPPTS Number 850.4100 and 850.4225 and OECD Guideline for Testing of Chemicals, Proposal for Updated Guideline 208: Terrestrial (Non-Target) Plant Test.

The following items were not reported: maximum label rate of the test material, the physiochemical properties of the test material, the variety of mung bean, historical % germination for mung bean, onion or rice, seed storage for any species; and geographic location, depth of collection, CEC and moisture content of the test soil.

These deviations did not affect the validity of the study.

COMPLIANCE: This study was conducted in compliance with Good Laboratory Standards as published by the U.S. EPA, 40 CFR Part 160, 17 August 1989; OECD Principles of Good Laboratory Practice (ENV/MC/CHEM (98) 17); and Japan MAFF, 59 NohSan Notification No. 3850, Agricultural Production Bureau, 10 August 1984. Signed and dated GLP, Quality Assurance and No Data Confidentiality statements were provided.

A. MATERIALS:

1. Test Material IR5878 50WG (containing the active ingredient Orthosulfamuron)

Description: Brown granular solid

Lot No./Batch No. : G038/02 (batch no.)

Purity: 49.96%

Stability of compound under test conditions: Mean-measured concentrations ranged from 98-107% of nominal. (OECD recommends chemical stability in water and light)

Storage conditions of

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test chemicals: Test material and adjuvant were stored at ambient conditions.

Table 2. Physical/chemical properties of Orthosulfamuron.

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

2. Test organism:

Monocotyledonous species: Corn (*Zea mays*, Family Poaceae, Mandan Bride), Oat (*Avena sativa*, Family Poaceae, Rodea), Onion (*Allium cepa*, Family Liliaceae, Texas Grano) and Rice (*Oryza sativa*, Family Poaceae, M202; *EPA recommends four monocots in two families, including corn.*

Dicotyledonous species: Carrot (*Daucus carota*, Family Apiaceae, Nantes), Mung Bean (*Phaseolus aureus*, Family Fabaceae, none provided), Oilseed rape (*Brassica napus*, Family Brassicaceae, Canola), Pea (*Pisum sativum*, Family Fabaceae, Laxton Progress #9), Radish (*Raphanus sativus*, Family Brassicaceae, Cherry Bell) and Soybean (*Glycine max*, Family Fabaceae, Green Envy); *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: Onion, Territorial Seed Co., Cottage Grove, OR; Oat, Corn, Oilseed Rape and Soybean, Johnny's Selected Seeds, Albion, ME; Rice, California Cooperative Rice Research Foundation, USA; Carrot, Pea and Radish, The Meyer Seed Co., Baltimore, MD; Mung Bean, Railway Market, Easton, MD

Prior seed treatment/sterilization: None

Historical % germination of seed: Not reported for mung bean, onion or rice. All other species, ≥85%.

Seed storage, if any: Not reported

B. STUDY DESIGN:

1. Experimental Conditions

- a. Limit test: N/A
- b. Range-finding study: A range-finding study was not reported.
- c. Definitive Study

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Table 3: Experimental Parameters - Seedling Emergence.

Parameters	Seedling Emergence	
	Details	Remarks <i>Criteria</i>
Duration of the test	21 Days	<p><i>Recommended test duration is 14-21 days.</i></p> <p><i>OECD recommends that the test be terminated no sooner than 14 days after 50 percent of the control seedlings have emerged</i></p>
Number of seeds/plants/species/replicate	4 reps/treatment, 10 seeds/rep, 40 seeds/treatment	<p><i>Ten seeds per replicate should be used.</i></p> <p><i>OECD recommends a minimum of five seeds planted in each replicate within 24 hours of incorporation of the test substance. All seeds of each species for each test should be of the same size class. The seed should not be imbibed.</i></p>
<u>Number of replicates</u> Control: 4 Solvent control: 4 Treated: 4		<p>An adjuvant control was used in lieu of a solvent control.</p> <p><i>Four replicates per dose should be used.</i></p> <p><i>OECD recommends a minimum of four replicates per treatment</i></p>
<u>Test concentrations (lb ai/A or g ai/ha)</u> Nominal: Measured:	0 (negative and adjuvant controls), 0.00163, 0.00489, 0.0147, 0.0440 and 0.132 lbs ai/A <0.5 ppb a.i. (negative and adjuvant controls), 0.00174, 0.00517, 0.0150, 0.0436 and 0.135 lbs ai/A	<p><i>Five test concentrations should be used with a dose range of 2X or 3X progression</i></p> <p><i>OECD recommends three concentrations, preferably with application rates equivalent to 0.0 (control), 1.0, 10.0 and 100 mg substance per kg of oven-dried soil.</i></p>
<u>Method and interval of analytical verification</u>	Samples were taken from definitive test spray mixtures and analyzed on the day of application	Triplicate samples were collected from the highest and lowest treatment groups and single samples were collected for the intermediate

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Parameters	Seedling Emergence	
	Details	Remarks
		----- <i>Criteria</i>
LOQ: LOD:	using high performance liquid chromatography (HPLC). Not reported 0.5 ppb a.i.	treatment groups and controls.
Solvent (type, percentage, if used)	ADJ1012 (adjuvant)	
<u>Test container (pot)</u> Size/Volume Material: (glass/polystyrene)	16 cm x 12 cm, 1940 cm ³ Plastic	----- <i>Non-porous containers should be used.</i> <i>OECD recommends that non-porous plastic or glazed pot be used.</i>
Growth facility	On-site glasshouse; GEM Room/ Location 1	
Method/depth of seeding	Corn, pea, rice, oat, mung bean and soybean were planted at a depth of approximately 20 mm, while all other species were planted at a depth of approximately 6 mm..	
<u>Test material application</u> Application time including the plant growth stage Number of applications Application interval Method of application	Test material was applied at test initiation to pre-emerged seeds. 1 N/A; one application at test initiation DeVries Research Track Sprayer (spray booth)	Onion, oat, corn mung bean and carrot received application of treatment material on March 12, 2003 and rice, pea, radish, soybean and oilseed rape received application of treatment on March 14, 2003.

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Parameters	Seedling Emergence	
	Details	Remarks
		----- <i>Criteria</i>
<u>Details of soil used</u> Geographic location Depth of soil collection Soil texture % sand % silt % clay pH: % organic carbon CEC Moisture at 1/3 atm (%)	Not reported Not reported Loamy sand soil 55% 26% 19% 7.3 2.0% Not reported Not reported	Crushed limestone was added to buffer the pH and a slow-release fertilizer was added to the soil to provide nutrients. The soil sample used for analysis was representative of the soil used in the definitive study, but not actually used. ----- <i>Soil mixes containing sandy loam, loam, or clay loam soil with no greater than 2% organic matter are preferable. Glass beads, rock wool, and 100% acid washed sand are not preferred.</i> <i>OECD prefers the soil to be sieved (0.5 cm) to remove coarse fragments. Carbon content should not exceed 1.5% (3% organic matter). Fine particles (under 20um) makeup should be between 10 and 20%. The recommended pH is between 5.0 and 7.5.</i>
Details of nutrient medium, if used	N/A	
<u>Watering regime and schedules</u> Water source/type: Volume applied: Interval of application: Method of application:	Well-water from glasshouse facility Not reported Water was added as needed Subirrigation	Study authors report that a predetermined amount of water was delivered to each tray on each watering occasion. ----- <i>EPA prefers that bottom watering be utilized for seedling emergence studies so that the chemical is not leached out of the soil during the test.</i>
Any pest control method/fertilization, if used	A slow-release fertilizer was added to the soil to provide nutrients.	

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<p><u>Test conditions</u></p> <p>Temperature: Photoperiod: Light intensity and quality: Relative humidity:</p> <p>Temperature: Photoperiod: Light intensity and quality: Relative humidity:</p>	<p><u>Onion, Oat, Corn, Mung Bean and Carrot:</u> 16.63-33.43°C 14L:10D 3.7-18.7 moles of PAR 10.33-80.40%</p> <p><u>Rice, Pea, Radish, Soybean and Oilseed Rape:</u> 16.63-33.43°C 14L:10D 3.7-19.2 moles of PAR 10.33-80.40%</p>	<p>-----</p> <p><i>EPA prefers that the cold vs warm loving plants be tested in two separate groups to optimize plant growth.</i></p> <p><i>OECD prefers that the temperature, humidity and light conditions be suitable for maintaining normal growth of each species for the test period.</i></p>
<p><u>Reference chemical (if used)</u></p> <p>Name: Concentrations:</p>	<p>N/A N/A</p>	
<p>Other parameters, if any</p>	<p>N/A</p>	

2. Observations:

Table 4: Observation Parameters - Seedling Emergence.

Parameters	Seedling Emergence	
	Details	Remarks
<p>Parameters measured (e.g., number of germinated seeds, emerged seedlings, plant height, dry weight or other endpoints)</p>	<p>Emergence, survival, plant height, dry weight and phytotoxicity.</p>	
<p>Measurement technique for each parameter</p>	<p>Emergence was defined as the presence of visible plant tissue at the surface of the soil. Survival and phytotoxicity were determined by visual observation. Seedling height was measured with a ruler to the nearest</p>	

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Parameters	Seedling Emergence	
	Details	Remarks
	whole centimeter from the surface of the soil to the apical meristem (soybean and mung bean), or to the tip of the tallest leaf (all other species). Seedlings were then clipped at soil level, the shoots of all living seedlings within a replicate were dried and the total dry weight of the shoots in each replicate was determined. Mean seedling height and dry weight were determined for each treatment group containing living seedlings at test termination.	
Observation intervals	Emergence was determined on Days 7, 14 and 21. Survival, plant height dry weight and phytotoxicity were determined at test termination (Day 21).	
Other observations, if any	None	
Were raw data included?	Yes	
Phytotoxicity rating system, if used	0, no effect; 10-30 slight effect (10- barely noticeable, 20- not apparently detrimental, 30- effect more pronounced); 40-60, moderate effect (40- moderate, recovery possible, 50-more lasting effect and recovery doubtful, 60- lasting effect and recovery doubtful); 70-90 severe effect (70- heavy injury w/ loss of leaves, 80- plant nearly	Rating scale adapted from: Frans, Robert E and Ronald E. Talbert. 1977. Design of Field Experiments and the Measurement and Analysis of Plant Responses. Pages 15-23 in B. Truelove, ed. Research Methods in Weed Science. Southern Weed Science Society, Auburn University, Alabama.

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Parameters	Seedling Emergence	
	Details	Remarks
	destroyed w/ few surviving leaves, 90-occasional surviving leaves); 100, complete effect	

II. RESULTS and DISCUSSION:

A. INHIBITORY EFFECTS:

1. Seedling Emergence:

There were no significant effects on the emergence, survival, plant height or dry weight of oat, corn, mung bean, oilseed rape or soybean. Emergence was not significantly reduced for any of the species tested. Survival of emerged seedlings was not significantly reduced for any of the species tested. Biomass of emerged seedling was significantly reduced for onion, rice, pea and radish. Plant height of emerged seedlings was significantly reduced for onion, rice, carrot and radish. Rice was the most sensitive monocot with a dry weight NOAEC and EC₂₅ of 0.044 and 0.0700 lbs ai/A, respectively. Radish was the most sensitive dicot with a dry weight NOAEC and EC₂₅ of 0.0147 and 0.0404 lbs ai/A, respectively

The study authors reported that the occasional signs of phytotoxicity did not appear to be dose-responsive and were generally not severe. Additionally, some mortality was observed during the test but, like the signs of phytotoxicity, there was no apparent dose-response. The rating score was as follows: 0, no noticeable effect; 10, barely noticeable effect (slight); 20, some effect, not apparently detrimental (slight); 30, effect more pronounced, not obviously detrimental (slight); 40, effect moderate, plants appear to be able to recover (moderate); 50, more lasting effect, recovery doubtful (moderate); 60, lasting effect, recovery doubtful (moderate); 70 heavy injury, loss of individual leaves (severe); 80 plant nearly destroyed, a few surviving leaves (severe); 90, occasional surviving leaves (severe) and 100, death of entire effect (mortality/complete effect). Rating scale was adapted from: Frans, Robert E and Ronald E. Talbert. 1977. Design of Field Experiments and the Measurement and Analysis of Plant Responses. Pages 15-23 in B. Truelove, ed. Research Methods in Weed Science. Southern Weed Science Society, Auburn University, Alabama.

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Table 5: Effect of IR5878 50WG on Seedling Emergence

Species	NOAEC, EC ₀₅ EC ₂₅ and EC ₅₀ (lbs ai/A)								
	Emergence (#)								
	# emerged*	NOAEC	EC ₀₅	95% C.I.	EC ₂₅	95% C.I.	EC ₅₀	95% C.I.	r ² **
Corn	9.25-9.75	0.132	NR	NR	>0.132	NR	>0.132	NR	NR
Oat	8.50-10.00	0.132	NR	NR	>0.132	NR	>0.132	NR	NR
Onion	7.75-9.25	0.132	NR	NR	>0.132	NR	>0.132	NR	NR
Rice	9.50-10.00	0.132	>0.132	NR	>0.132	NR	>0.132	NR	NR
Carrot	6.25-8.25	0.132	>0.132	NR	>0.132	NR	>0.132	NR	NR
Mung Bean	9.75-10.00	0.132	>0.132	NR	>0.132	NR	>0.132	NR	NR
Oilseed Rape	9.00-10.00	0.132	NR	NR	>0.132	NR	>0.132	NR	NR
Pea	9.25-10.00	0.132	NR	NR	>0.132	NR	>0.132	NR	NR
Radish	9.75-10.00	0.132	>0.132	NR	>0.132	NR	>0.132	NR	NR
Soybean	9.00-9.75	0.132	>0.132	NR	>0.132	NR	>0.132	NR	NR

* provide the range

** The study author did not report the Slope, so the squared correlation coefficient is provided from their analyses.

The range for emergence, survival, dry weight and plant length represent the range of treatment means on Day 21

NR- Not reported

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Table 5 (cont): Effect of IR5878 50WG on Seedling Emergence

Species	NOAEC, EC ₀₅ EC ₂₅ and EC ₅₀ (lbs ai/A)								
	Survival (#)								
	# survived*	NOAEC	EC ₀₅	95% C.I.	EC ₂₅	95% C.I.	EC ₅₀	95% C.I.	r ²
Corn	9.25-9.75	0.132	NR	NR	>0.132	NR	>0.132	NR	NR
Oat	8.25-9.75	0.132	NR	NR	>0.132	NR	>0.132	NR	NR
Onion	8.25-9.75	0.132	NR	NR	>0.132	NR	>0.132	NR	NR
Rice	9.25-10.00	0.132	NR	NR	>0.132	NR	>0.132	NR	NR
Carrot	6.00-8.00	0.132	>0.132	NR	>0.132	NR	>0.132	NR	NR
Mung Bean	9.75-10.00	0.132	>0.132	NR	>0.132	NR	>0.132	NR	NR
Oilseed Rape	9.00-10.00	0.132	>0.132	NR	>0.132	NR	>0.132	NR	NR
Pea	8.75-10.00	0.132	NR	NR	>0.132	NR	>0.132	NR	NR
Radish	9.00-9.75	0.132	>0.132	NR	>0.132	NR	>0.132	NR	NR
Soybean	9.00-9.75	0.132	>0.132	NR	>0.132	NR	>0.132	NR	NR

* provide the range; the study authors conducted their analysis on the number of plants surviving at day 21, rather than the percentage of those surviving of those emerged on day 21.

The range for emergence, survival, dry weight and plant length represent the range of treatment means on Day 21

NR- Not reported

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Table 5 (cont): Effect of IR5878 50WG on Seedling Emergence

Species	NOAEC, EC ₀₅ EC ₂₅ and EC ₅₀ (lbs ai/A)								
	Dry Weight (g)								
	g*	NOAEC	EC ₀₅	95% C.I.	EC ₂₅	95% C.I.	EC ₅₀	95% C.I.	r ²
Corn	6.64-7.76	0.132	>0.132	NR	>0.132	NR	>0.132	NR	NR
Oat	1.60-1.99	0.132	NR	NR	>0.132	NR	>0.132	NR	NR
Onion	0.050-0.089	0.0440	NR	NR	0.127	0.123-0.132	>0.132	NR	0.82993
Rice	0.31-0.63	0.0440	NR	NR	0.070	0.023-0.209	0.142	0.068-0.296	0.74862
Carrot	0.042-0.072	0.132	NR	NR	0.0975	0.034-0.283	>0.132	NR	0.62586
Mung Bean	1.96-2.20	0.132	NR	NR	>0.132	NR	>0.132	NR	NR
Oilseed Rape	3.17-3.62	0.132	>0.132	NR	>0.132	NR	>0.132	NR	NR
Pea	1.97-3.17	0.0440	NR	NR	0.0991	0.062-0.159	>0.132	NR	0.88249
Radish	0.72-3.15	0.0147	NR	NR	0.0404	0.0316-0.0516	0.0719	0.0621-0.0832	0.99092
Soybean	6.40-7.84	0.132	NR	NR	>0.132	NR	>0.132	NR	NR

* provide the range

The range for emergence, survival, dry weight and plant length represent the range of treatment means on Day 21

NR- Not reported

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Table 5 (cont): Effect of IR5878 50WG on Seedling Emergence

Species	NOAEC, EC ₀₅ , EC ₂₅ and EC ₅₀ (lbs ai/A)								
	Height (cm)								
	cm*	NOAEC	EC ₀₅	95% C.I.	EC ₂₅	95% C.I.	EC ₅₀	95% C.I.	r ²
Corn	49.5-54.6	0.132	>0.132	NR	>0.132	NR	>0.132	NR	NR
Oat	33.6-37.1	0.132	NR	NR	>0.132	NR	>0.132	NR	NR
Onion	6.4-9.4	0.0440	NR	NR	>0.132	NR	>0.132	NR	NR
Rice	22.9-27.4	0.0440	NR	NR	>0.132	NR	>0.132	NR	NR
Carrot	4.1-6.6	0.0440	NR	NR	0.130	0.128-0.133	>0.132	NR	0.86784
Mung Bean	11.4-11.8	0.132	>0.132	NR	>0.132	NR	>0.132	NR	NR
Oilseed Rape	19.7-21.0	0.132	NR	NR	>0.132	NR	>0.132	NR	NR
Pea	10.5-14.3	0.132	NR	NR	>0.132	NR	>0.132	NR	NR
Radish	4.1-16.5	0.0440	NR	NR	0.0572	0.0495-0.0661	0.0878	0.0807-0.0955	0.99532
Soybean	25.4-28.9	0.132	NR	NR	>0.132	NR	>0.132	NR	NR

* provide the range

The range for emergence, survival, dry weight and plant length represent the range of treatment means on Day 21

NR- Not reported

Plant Injury Index*									
Corn	Oat	Onion	Rice	Carrot	Mung Bean	Oilseed Rape	Pea	Radish	Soybean
0-100	0-100	0-100	0-100	0-100	0-50	0-100	0-100	0-100	0-100

**0, no effect; 10-30 slight effect; 40-60, moderate effect; 70-90 severe effect; 100, complete effect

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B. REPORTED STATISTICS:

The study authors state that "...for each test species the negative and adjuvant control groups were pooled for comparison to the remaining test groups." Pooling of the adjuvant and negative controls is generally considered inappropriate since the adjuvant is a treatment reflecting the use of orthosulfamuron in the field.

C. VERIFICATION OF STATISTICAL RESULTS BY THE REVIEWER:

Any species exhibiting a $\geq 5\%$ reduction in seedling emergence, survival, dry weight or plant height when compared to the control was statistically analyzed for significance. All analyzed data were tested for normality and homogeneity and if these assumptions of ANOVA were met, the NOAEC values were determined using Dunnett's Test or Bonferroni's Test and William's Test (parametric) or Kruskal-Wallis or Steele's many-one rank tests (non-parametric) via Toxstat Statistical Software. The ECx values (with 95% C.I.) and probit slopes were determined using Nuthatch Statistical Software. The EC₂₅ and EC₅₀ values were determined visually when the % reduction when compared to the control was <25% or <50%, respectively. All analyses were conducted using the mean-measured treatment concentrations. Phytotoxicity was not statistically analyzed as this endpoint is a qualitative value. Percent survival was calculated by the reviewer as the number of plants surviving at day 21 divided by the number of seeds emerged at day 21, multiplied by 100. Due to the non-linear responses of several species and endpoints, the reviewer visually determined a more conservative NOAEC value based on the percent reduction when compared to the control instead of the value determined in the analyses. See the Reviewer's Comments section for further detail. When necessary, dry weight was converted to mg to avoid mean values of zero within Toxstat. For all species and endpoints, the reviewer determined if the negative and adjuvant controls were statistically different using a t-test for paired means via Microsoft Excel. See Reviewer's Comments section for further discussion of these determinations.

	Seedling Emergence Value:	95% C.I.
<u>Monocot:</u>		
Most sensitive monocot: Rice		
Most sensitive parameter: Dry Weight		
EC ₅₀ /IC ₅₀ :	0.15 lbs ai/A	0.083-0.28 lbs ai/A
EC ₂₅ /IC ₂₅ :	0.078 lbs ai/A	0.031-0.20 lbs ai/A
NOAEC:	0.0150 lbs ai/A	
Probit slope:	2.34±1.66	
<u>Dicot:</u>		
Most sensitive dicot: Radish		
Most sensitive parameter: Dry Weight		
EC ₅₀ /IC ₅₀ :	0.072 lbs ai/A	0.060-0.088 lbs ai/A
EC ₂₅ /IC ₂₅ :	0.040 lbs ai/A	0.029-0.055 lbs ai/A
NOAEC:	0.0150 lbs ai/A	
Probit slope:	2.63±0.355	

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Table 6: Effect of IR5878 50WG on Seedling Emergence

Species	NOAEC, EC ₀₅ EC ₂₅ and EC ₅₀ (lbs ai/A)								
	Emergence (#)								
	# emerged*	NOAEC	EC ₀₅	95% C.I.	EC ₂₅	95% C.I.	EC ₅₀	95% C.I.	Slope
Com	9.25-9.75	0.135	0.12	0.0052-2.6	>0.135	N/A	>0.135	N/A	0.517±0.727
Oat	8.50-10.00	0.135	0.0030	1.1E ⁻⁰⁵ -0.82	>0.135	N/A	>0.135	N/A	0.356±0.222
Onion	7.75-9.25	0.135	ND	ND	>0.135	N/A	>0.135	N/A	ND
Rice	9.50-10.00	0.135	ND	ND	>0.135	N/A	>0.135	N/A	ND
Carrot	6.25-8.25	0.135	>0.135	N/A	>0.135	N/A	>0.135	N/A	N/A
Mung Bean	9.75-10.00	0.135	>0.135	N/A	>0.135	N/A	>0.135	N/A	N/A
Oilseed Rape	9.00-10.00	0.135	>0.135	N/A	>0.135	N/A	>0.135	N/A	N/A
Pea	9.25-10.00	0.135	ND	ND	>0.135	N/A	>0.135	N/A	ND
Radish	9.75-10.00	0.135	>0.135	N/A	>0.135	N/A	>0.135	N/A	N/A
Soybean	9.00-9.75	0.135	ND	ND	>0.135	N/A	>0.135	N/A	ND

* provide the range

The range for emergence, survival, dry weight and plant length represent the range of treatment means on Day 21

ND- Not determined

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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Table 6 (cont): Effect of IR5878 50WG on Seedling Emergence

Species	NOAEC, EC ₀₅ EC ₂₅ and EC ₅₀ (lbs ai/A)								
	Survival (%)								
	%*	NOAEC	EC ₀₅	95% C.I.	EC ₂₅	95% C.I.	EC ₅₀	95% C.I.	Slope
Corn	97.25-100	0.135	>0.135	N/A	>0.135	N/A	>0.135	N/A	N/A
Oat	91.75-100	0.135	>0.135	N/A	>0.135	N/A	>0.135	N/A	N/A
Onion	94-97.25	0.135	>0.135	N/A	>0.135	N/A	>0.135	N/A	N/A
Rice	97.5-100	0.135	>0.135	N/A	>0.135	N/A	>0.135	N/A	N/A
Carrot	87.25-97.25	0.135	>0.135	N/A	>0.135	N/A	>0.135	N/A	N/A
Mung Bean	100-100	0.135	>0.135	N/A	>0.135	N/A	>0.135	N/A	N/A
Oilseed Rape	92.25-100	0.135	>0.135	N/A	>0.135	N/A	>0.135	N/A	N/A
Pea	92.5-100	0.135	0.135	ND	>0.135	N/A	>0.135	N/A	ND
Radish	90-97.5	0.135	>0.135	N/A	>0.135	N/A	>0.135	N/A	N/A
Soybean	97.25-100	0.135	>0.135	N/A	>0.135	N/A	>0.135	N/A	N/A

* provide the range; the reviewer calculated percent survival as a proportion of the plants surviving on day 21 over those emerged by day 21. The range for emergence, survival, dry weight and plant length represent the range of treatment means on Day 21
 ND- Not determined

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Table 6 (cont): Effect of IR5878 50WG on Seedling Emergence

Species	NOAEC, EC ₀₅ EC ₂₅ and EC ₅₀ (lbs ai/A)								
	Dry Weight (g)								
	g*	NOAEC	EC ₀₅	95% C.I.	EC ₂₅	95% C.I.	EC ₅₀	95% C.I.	Slope
Corn	6.64-7.76	0.135	>0.135	N/A	>0.135	N/A	>0.135	N/A	N/A
Oat	1.60-1.99	0.135	0.00072	2.6E ⁻¹⁰ - 2.0E ⁺⁰³	>0.135	N/A	>0.135	N/A	0.277±0.354
Onion	0.050-0.089	0.135	ND	ND	ND	ND	>0.135	N/A	ND
Rice	0.31-0.63	0.0436	0.030	0.0033-0.27	0.078	0.031-0.20	0.15	0.083-0.28	2.34±1.66
Carrot	0.042-0.072	0.135	0.029	0.00042-2.1	0.097	0.024-0.39	>0.135	N/A	1.86±2.48
Mung Bean	1.96-2.20	0.135	ND	ND	>0.135	N/A	>0.135	N/A	ND
Oilseed Rape	3.17-3.62	0.135	>0.135	N/A	>0.135	N/A	>0.135	N/A	N/A
Pea	1.97-3.17	0.135	0.031	0.0044-0.22	0.093	0.048-0.18	>0.135	N/A	2.02±1.27
Radish	0.72-3.15	0.0150	0.017	0.010-0.029	0.040	0.029-0.055	0.072	0.060- 0.088	2.63±0.355
Soybean	6.40-7.84	0.0436	0.0083	9.8E ⁻⁰⁵ -0.71	>0.135	N/A	>0.135	N/A	0.557±0.376

* provide the range

The range for emergence, survival, dry weight and plant length represent the range of treatment means on Day 21

ND- Not determined

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Table 6 (cont): Effect of IR5878 50WG on Seedling Emergence

Species	NOAEC, EC ₀₅ EC ₂₅ and EC ₅₀ (lbs ai/A)								
	Height (cm)								
	cm*	NOAEC	EC ₀₅	95% C.I.	EC ₂₅	95% C.I.	EC ₅₀	95% C.I.	Slope
Corn	49.5-54.6	0.135	>0.135	N/A	>0.135	N/A	>0.135	N/A	N/A
Oat	33.6-37.1	0.135	>0.135	N/A	>0.135	N/A	>0.135	N/A	N/A
Onion	6.4-9.4	0.0436	ND	ND	>0.135	N/A	>0.135	N/A	ND
Rice	22.9-27.4	0.135	0.079	0.012-0.52	>0.135	N/A	>0.135	N/A	1.96±3.06
Carrot	4.1-6.6	0.0436	ND	ND	ND	ND	>0.135	N/A	ND
Mung Bean	11.4-11.8	0.135	ND	ND	>0.135	N/A	>0.135	N/A	ND
Oilseed Rape	19.7-21.0	0.135	ND	ND	>0.135	N/A	>0.135	N/A	ND
Pea	10.5-14.3	0.135	0.023	0.00082-0.63	>0.135	N/A	>0.135	N/A	1.15±0.994
Radish	4.1-16.5	0.0436	0.030	0.017-0.052	0.057	0.041-0.078	0.088	0.073-0.11	3.50±0.630
Soybean	25.4-28.9	0.135	0.065	0.0095-0.45	>0.135	N/A	>0.135	N/A	1.04±1.08

* provide the range

The range for emergence, survival, dry weight and plant length represent the range of treatment means on Day 21

ND- Not determined

Plant Injury Index*									
Corn	Oat	Onion	Rice	Carrot	Mung Bean	Oilseed Rape	Pea	Radish	Soybean
0-100	0-100	0-100	0-100	0-100	0-50	0-100	0-100	0-100	0-100

**0. no effect; 10-30 slight effect; 40-60, moderate effect; 70-90 severe effect; 100, complete effect

D. STUDY DEFICIENCIES:

There were no study deficiencies.

E. REVIEWER'S COMMENTS:

The reviewer's results were similar to the study authors'. Radish was the most sensitive species, with an EC₂₅ of 0.040 lbs ai/A based on dry weight; the study author reported an EC₂₅ of 0.0404 lbs ai/A. Any differences between the study authors' and reviewer's toxicity estimates are likely due to the fact that the reviewer based estimates on the mean measured concentrations, while the study authors based them on the nominal concentrations. Results of the reviewer's statistical output are reported in the Executive Summary and Conclusions sections of this DER because they are based on mean-measured concentrations and include EC₀₅ values and probit slopes.

In the analyses for emergence, the NOAEC was 0.135 lbs ai/A since there were no statistically significant differences detected. However, for oats there was a 3% reduction in survival at 0.00517 lbs ai/A and reductions of ≥10% at the mean-measured 0.0150-0.135 lbs ai/A treatment levels. No other species exhibited significant

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reductions in emergence compared to the negative control based on either statistical analysis or percent reduction.

In the analyses for dry weight, the lowest NOAEC was associated with peas and radishes and was 0.0150 lbs ai/A. A NOAEC of 0.0436 ai/A was also determined for onion, rice, carrot and soybean. values for oat, carrot, pea and soybean were determined visually based on the percent reductions relative to the negative control. For oat there was a $\geq 12\%$ reduction compared to control at the mean-measured 0.0150-0.135 lbs ai/A treatment levels. For carrot there was a 21% reduction at the mean-measured 0.135 lbs ai/A treatment level relative to the negative control. For pea there was a 12 and 38% reduction in dry weight at the mean-measured 0.0436 and 0.135 lbs ai/A treatment levels, respectively, relative to the negative control. For soybean there was a $\geq 10\%$ reduction at the mean-measured 0.0150-0.135 lbs ai/A treatment levels relative to the control.

In the analyses for plant height, the NOAEC values for onion, carrot and radish were the lowest at 0.0436 lbs ai/A. The EC₀₅ and EC₂₅ values for carrot plant height were not determined and the reviewer attributes this to the non-linear response of carrot to the test material. For radish there was a 12 and 74% reduction at the mean-measured 0.0436 and 0.135 lbs ai/A treatment levels, respectively, relative to the negative control.

In the analyses comparing the negative and adjuvant controls, significant differences were detected between the two for oat dry weight and emergence, oilseed rape emergence, and radish survival; for these parameters, the treatment responses did not differ from the negative control.

The in-life portion of the seedling emergence test with oat, carrot, onion, mung bean and corn was conducted from March 12 to April 2, 2003. The in-life portion of the seedling emergence test with oilseed rape, pea, radish, rice and soybean was conducted from March 14 to April 4, 2003. Dry weights were complete by April 7, 2003.

The adjuvant control was sprayed with a 0.2% mixture of adjuvant (ADJ1012) in water.

The analytical standard that was used to prepare the calibration standards for the study was received from Isagro on May 6, 2002. It was assigned Wildlife International, Ltd. identification number 5968 upon receipt and was stored under ambient conditions in the dark. The analytical standard, a white powder, was identified as: IR5878 Technical, Batch number G009/02, CAS number 213464-77-8. The analytical standard had an expiration date of April 2004 and a reported purity of 98.56%.

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F. CONCLUSIONS:

The most sensitive monocot was rice, based on dry weight, with a NOAEC and EC₂₅ of 0.0150 and 0.078 lbs ai/A. The most sensitive dicot was radish, also based on dry weight, with a NOAEC and EC₂₅ of 0.0150 and 0.040 lbs ai/A. This study is scientifically sound and is classified ACCEPTABLE.

	Seedling Emergence Value:	95% C.I.
<u>Monocot:</u>		
Most sensitive monocot: Rice		
Most sensitive parameter: Dry Weight		
EC ₅₀ /IC ₅₀ :	0.15 lbs ai/A	0.083-0.28 lbs ai/A
EC ₂₅ /IC ₂₅ :	0.078 lbs ai/A	0.031-0.20 lbs ai/A
EC ₀₅ /IC ₀₅ :	0.030 lbs ai/A	0.0033-0.27 lbs ai/A
NOAEC:	0.0436 lbs ai/A	
Probit slope:	2.34±1.66	
<u>Dicot:</u>		
Most sensitive dicot: Radish		
Most sensitive parameter: Dry Weight		
EC ₅₀ /IC ₅₀ :	0.072 lbs ai/A	0.060-0.088 lbs ai/A
EC ₂₅ /IC ₂₅ :	0.040 lbs ai/A	0.029-0.055 lbs ai/A
EC ₀₅ /IC ₀₅ :	0.017 lbs ai/A	0.010-0.029 lbs ai/A
NOAEC:	0.0150 lbs ai/A	
Probit slope:	2.63±0.355	

III. REFERENCES:

- U.S. Environmental Protection Agency. 1996. Series 850- Ecological Effects Test Guidelines (*draft*), OPPTS Number 850.4100: Terrestrial Plant Toxicity, Tier I, (Seedling Emergence).
- U.S. Environmental Protection Agency. 1996. Series 850- Ecological Effects Test Guidelines (*draft*), OPPTS Number 850.4225: Terrestrial Plant Toxicity, Tier II (Seedling Emergence).
- OECD Guideline for Testing of Chemicals. 2000. Proposal for Updated Guideline 208: Terrestrial Non-Target Plant Test: (Part A) Seedling Emergence and Seedling Growth Test (Draft Document, July 2000).
- Frans, Robert E. and Ronald E. Talbert. 1977. Design of Field Experiments and the Measurement and Analysis of Plant Responses. Pages 15-23 in B. Truelove, ed. Research Methods in Weed Science. Southern Weed Science Society, Auburn University, Alabama.
- SAS Institute, Inc. 1999. SAS Proprietary Software Version 8, Cary, NC, SAS Institute, Inc.
- Bruce, Robert D. and Donald J. Versteeg. 1992. A Statistical Procedure for Modeling Continuous Toxicity Data. *Environmental Toxicology and Chemistry*. 11: 1485-1494.

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APPENDIX I. OUTPUT OF REVIEWER'S STATISTICAL VERIFICATION:

Corn emergence (#); lbs ai/A; Day 21
File: 8941ce Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	0.833	0.167	0.429
Within (Error)	18	7.000	0.389	
Total	23	7.833		

Critical F value = 2.77 (0.05,5,18)
Since F < Critical F FAIL TO REJECT Ho:All groups equal

Corn emergence (#); lbs ai/A; Day 21
File: 8941ce 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	9.750	9.750		
2	0.00174	9.750	9.750	0.000	
3	0.00517	9.750	9.750	0.000	
4	0.0150	9.500	9.500	0.567	
5	0.0436	9.500	9.500	0.567	
6	0.135	9.250	9.250	1.134	

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

Corn emergence (#); lbs ai/A; Day 21
File: 8941ce 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	4			
2	0.00174	4	1.063	10.9	0.000
3	0.00517	4	1.063	10.9	0.000
4	0.0150	4	1.063	10.9	0.250
5	0.0436	4	1.063	10.9	0.250
6	0.135	4	1.063	10.9	0.500

Corn emergence (#); lbs ai/A; Day 21
File: 8941ce Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

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GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	9.750	9.750	9.750
2	0.00174	4	9.750	9.750	9.750
3	0.00517	4	9.750	9.750	9.750
4	0.0150	4	9.500	9.500	9.500
5	0.0436	4	9.500	9.500	9.500
6	0.135	4	9.250	9.250	9.250

Corn emergence (#); lbs ai/A; Day 21
 File: 8941ce Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	9.750				
0.00174	9.750	0.000		1.73	k= 1, v=18
0.00517	9.750	0.000		1.82	k= 2, v=18
0.0150	9.500	0.567		1.85	k= 3, v=18
0.0436	9.500	0.567		1.86	k= 4, v=18
0.135	9.250	1.134		1.87	k= 5, v=18

s = 0.624

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

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.12	0.0052	2.6	0.65	0.045
EC10	0.58	0.0044	76.	1.0	0.0076
EC25	8.7	4.7E-05	1.6E+06	2.5	5.4E-06
EC50	1.7E+02	1.7E-07	1.8E+11	4.3	9.7E-10

Slope = 0.517 Std.Err. = 0.727

Goodness of fit: p = 0.98 based on DF= 3.0 18.

8941CE : Corn emergence (#); lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	4.00	9.75	9.77	-0.0239	100.	0.00
0.00174	4.00	9.75	9.73	0.0233	99.5	0.483
0.00517	4.00	9.75	9.68	0.0696	99.0	0.957
0.0150	4.00	9.50	9.60	-0.101	98.2	1.77
0.0436	4.00	9.50	9.47	0.0308	96.9	3.12
0.135	4.00	9.25	9.25	0.00103	94.6	5.37

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

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

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

corn % survival

File: 8941ns

Transform: NO TRANSFORM

STEELS MANY-ONE RANK TEST

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	RANK SUM	CRIT. VALUE	df	SIG
1	control	100.000				
2	0.00174	100.000	18.00	10.00	4.00	
3	0.00517	100.000	18.00	10.00	4.00	
4	0.0150	97.250	16.00	10.00	4.00	
5	0.0436	97.250	16.00	10.00	4.00	
6	0.135	100.000	18.00	10.00	4.00	

Critical values use k = 5, are 1 tailed, and alpha = 0.05

Oat emergence (#), lbs ai/A; Day 21

File: 8941oe

Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	10.000	10.000	70.000
2	0.00174	10.000	10.000	70.000
3	0.00517	9.750	9.750	60.000
4	0.0150	9.000	9.000	35.500
5	0.0436	8.500	8.500	29.000
6	0.135	9.000	9.000	35.500

Calculated H Value = 11.217

Critical H Value Table = 11.070

Since Calc H > Crit H REJECT Ho:All groups are equal.

Oat emergence (#), lbs ai/A; Day 21

File: 8941oe

Transform: NO TRANSFORMATION

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

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP						
				5	4	6	3	1	2	
5	0.0436	8.500	8.500	\						
4	0.0150	9.000	9.000	.	\					
6	0.135	9.000	9.000	.	.	\				
3	0.00517	9.750	9.750	.	.	.	\			
1	neg control	10.000	10.000	.	.	.	.	\
2	0.00174	10.000	10.000	.	.	.	.	.	\

* = significant difference (p=0.05)

. = no significant difference

Table q value (0.05,6) = 2.936

SE = 4.431

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}

EPA MRID Number 465789-41

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.0030	1.1E-05	0.82	1.2	0.0037
EC10	0.032	0.0012	0.84	0.68	0.038
EC25	1.6	0.024	1.1E+02	0.88	0.015
EC50	1.3E+02	0.012	1.4E+06	1.9	9.3E-05

Slope = 0.356 Std.Err. = 0.222

Goodness of fit: p = 0.24 based on DF= 3.0 18.

89410E : Oat emergence (#), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. - Pred.	Pred. %Control	%Change
0.00	4.00	10.0	10.1	-0.109	100.	0.00
0.00174	4.00	10.0	9.69	0.313	95.8	4.18
0.00517	4.00	9.75	9.51	0.238	94.1	5.91
0.0150	4.00	9.00	9.29	-0.289	91.9	8.11
0.0436	4.00	8.50	9.01	-0.509	89.1	10.9
0.135	4.00	9.00	8.64	0.356	85.5	14.5

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

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

oat % survival
File: 8941os Transform: NO TRANSFORM

STEELS MANY-ONE RANK TEST - Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	RANK SUM	CRIT. VALUE	df	SIG
1	control	97.500				
2	0.00174	97.500	18.00	10.00	4.00	
3	0.00517	100.000	20.00	10.00	4.00	
4	0.0150	91.750	15.00	10.00	4.00	
5	0.0436	100.000	20.00	10.00	4.00	
6	0.135	100.000	20.00	10.00	4.00	

Critical values use k = 5, are 1 tailed, and alpha = 0.05

Oat mean dry weight (g), lbs ai/A; Day 21
File: 8941ow Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	0.468	0.094	0.969
Within (Error)	18	1.754	0.097	

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}

EPA MRID Number 465789-41

Total 23 2.223

Critical F value = 2.77 (0.05,5,18)
 Since F < Critical F FAIL TO REJECT Ho:All groups equal

Oat mean dry weight (g), lbs ai/A; Day 21
 File: 8941ow Transform: NO TRANSFORMATION

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

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	1.959	1.959		
2	0.00174	1.795	1.795	0.746	
3	0.00517	1.986	1.986	-0.121	
4	0.0150	1.605	1.605	1.610	
5	0.0436	1.722	1.722	1.076	
6	0.135	1.685	1.685	1.246	

Dunnnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

Oat mean dry weight (g), lbs ai/A; Day 21
 File: 8941ow 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	4			
2	0.00174	4	0.531	27.1	0.164
3	0.00517	4	0.531	27.1	-0.027
4	0.0150	4	0.531	27.1	0.354
5	0.0436	4	0.531	27.1	0.237
6	0.135	4	0.531	27.1	0.274

Oat mean dry weight (g), lbs ai/A; Day 21
 File: 8941ow Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	1.959	1.959	1.959
2	0.00174	4	1.795	1.795	1.891
3	0.00517	4	1.986	1.986	1.891
4	0.0150	4	1.605	1.605	1.671
5	0.0436	4	1.722	1.722	1.671
6	0.135	4	1.685	1.685	1.671

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}

EPA MRID Number 465789-41

Oat mean dry weight (g), lbs ai/A; Day 21
 File: 8941ow Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	1.959				
0.00174	1.891	0.311		1.73	k= 1, v=18
0.00517	1.891	0.311		1.82	k= 2, v=18
0.0150	1.671	1.308		1.85	k= 3, v=18
0.0436	1.671	1.308		1.86	k= 4, v=18
0.135	1.671	1.308		1.87	k= 5, v=18

s = 0.312

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

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.00072	2.6E-10	2.0E+03	3.1	3.6E-07
EC10	0.015	2.9E-06	74.	1.8	0.00020
EC25	2.3	5.6E-05	9.3E+04	2.2	2.4E-05
EC50	6.2E+02	2.3E-08	1.7E+13	5.0	3.7E-11

Slope = 0.277 Std.Err. = 0.354

Goodness of fit: p = 0.50 based on DF= 3.0 18.

8941OW : Oat mean dry weight (g), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	4.00	1.96	1.96	-0.00385	100.	0.00
0.00174	4.00	1.79	1.84	-0.0464	93.8	6.20
0.00517	4.00	1.99	1.81	0.179	92.0	7.97
0.0150	4.00	1.60	1.77	-0.161	90.0	10.0
0.0436	4.00	1.72	1.72	0.00451	87.5	12.5
0.135	4.00	1.68	1.66	0.0263	84.5	15.5

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

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

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

Oat mean plant height (cm), lbs ai/A; Day 21
 File: 8941oh Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	36.304	7.261	1.069

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}	EPA MRID Number 465789-41		
Within (Error)	18	122.252	6.792
<hr style="border-top: 1px dashed black;"/>			
Total	23	158.556	

Critical F value = 2.77 (0.05,5,18)
 Since F < Critical F FAIL TO REJECT Ho:All groups equal

Oat mean plant height (cm), lbs ai/A; Day 21
 File: 8941oh 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	33.500	33.500		
2	0.00174	35.475	35.475	-1.072	
3	0.00517	35.600	35.600	-1.140	
4	0.0150	37.050	37.050	-1.926	
5	0.0436	33.575	33.575	-0.041	
6	0.135	35.175	35.175	-0.909	

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

Oat mean plant height (cm), lbs ai/A; Day 21
 File: 8941oh 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	4			
2	0.00174	4	4.441	13.3	-1.975
3	0.00517	4	4.441	13.3	-2.100
4	0.0150	4	4.441	13.3	-3.550
5	0.0436	4	4.441	13.3	-0.075
6	0.135	4	4.441	13.3	-1.675

Oat mean plant height (cm), lbs ai/A; Day 21
 File: 8941oh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	33.500	33.500	33.500
2	0.00174	4	35.475	35.475	35.375
3	0.00517	4	35.600	35.600	35.375
4	0.0150	4	37.050	37.050	35.375
5	0.0436	4	33.575	33.575	35.375
6	0.135	4	35.175	35.175	35.375

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}

EPA MRID Number 465789-41

Oat mean plant height (cm), lbs ai/A; Day 21
 File: 8941oh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	33.500				
0.00174	35.375	1.017		1.73	k= 1, v=18
0.00517	35.375	1.017		1.82	k= 2, v=18
0.0150	35.375	1.017		1.85	k= 3, v=18
0.0436	35.375	1.017		1.86	k= 4, v=18
0.135	35.375	1.017		1.87	k= 5, v=18

s = 2.606

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

Onion emergence (#); lbs ai/A; Day 21
 File: 8941ne Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	9.000	9.000	54.000
2	0.00174	9.250	9.250	64.000
3	0.00517	7.750	7.750	31.000
4	0.0150	8.500	8.500	41.000
5	0.0436	9.000	9.000	55.000
6	0.135	9.000	9.000	55.000

Calculated H Value = 3.812 Critical H Value Table = 11.070
 Since Calc H < Crit H FAIL TO REJECT Ho: All groups are equal.

Onion emergence (#); lbs ai/A; Day 21
 File: 8941ne Transform: NO TRANSFORMATION

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

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP						
				0	0	0	0	0	0	
3	0.00517	7.750	7.750	\						
4	0.0150	8.500	8.500	.	\					
1	neg control	9.000	9.000	.	.	\				
5	0.0436	9.000	9.000	.	.	.	\			
6	0.135	9.000	9.000	.	.	.	.	\
2	0.00174	9.250	9.250	.	.	.	.	.	\

* = significant difference (p=0.05) . = no significant difference
 Table q value (0.05,6) = 2.936 SE = 4.805

onion % survival
 File: 8941is Transform: NO TRANSFORM

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}

EPA MRID Number 465789-41

STEELS MANY-ONE RANK TEST - Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	RANK SUM	CRIT. VALUE	df	SIG
1	control	97.250				
2	0.00174	94.000	16.00	10.00	4.00	
3	0.00517	96.500	17.50	10.00	4.00	
4	0.0150	94.250	15.50	10.00	4.00	
5	0.0436	95.000	17.00	10.00	4.00	
6	0.135	94.500	16.00	10.00	4.00	

Critical values use k = 5, are 1 tailed, and alpha = 0.05

Onion mean dry weight (mg), lbs ai/A; Day 21
 File: 8941nw Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	3901.375	780.275	2.166
Within (Error)	18	6483.250	360.181	
Total	23	10384.625		

Critical F value = 2.77 (0.05,5,18)
 Since F < Critical F FAIL TO REJECT Ho:All groups equal

Onion mean dry weight (mg), lbs ai/A; Day 21
 File: 8941nw 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	82.750	82.750		
2	0.00174	88.750	88.750	-0.447	
3	0.00517	73.500	73.500	0.689	
4	0.0150	81.500	81.500	0.093	
5	0.0436	84.500	84.500	-0.130	
6	0.135	50.250	50.250	2.422	*

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

Onion mean dry weight (mg), lbs ai/A; Day 21
 File: 8941nw Transform: NO TRANSFORMATION

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

NUM OF	Minimum Sig Diff	% of	DIFFERENCE
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Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}			EPA MRID Number 465789-41			
GROUP	IDENTIFICATION	REPS	(IN ORIG. UNITS)	CONTROL	FROM CONTROL	
1	neg control	4				
2	0.00174	4	32.342	39.1	-6.000	
3	0.00517	4	32.342	39.1	9.250	
4	0.0150	4	32.342	39.1	1.250	
5	0.0436	4	32.342	39.1	-1.750	
6	0.135	4	32.342	39.1	32.500	

Onion mean dry weight (mg), lbs ai/A; Day 21
 File: 894lnw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	82.750	82.750	85.750
2	0.00174	4	88.750	88.750	85.750
3	0.00517	4	73.500	73.500	79.833
4	0.0150	4	81.500	81.500	79.833
5	0.0436	4	84.500	84.500	79.833
6	0.135	4	50.250	50.250	50.250

Onion mean dry weight (mg), lbs ai/A; Day 21
 File: 894lnw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	85.750				
0.00174	85.750	0.224		1.73	k= 1, v=18
0.00517	79.833	0.217		1.82	k= 2, v=18
0.0150	79.833	0.217		1.85	k= 3, v=18
0.0436	79.833	0.217		1.86	k= 4, v=18
0.135	50.250	2.422	*	1.87	k= 5, v=18

s = 18.978

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

Onion mean plant height (cm), lbs ai/A; Day 21
 File: 894lnh Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	23.124	4.625	4.469
Within (Error)	18	18.622	1.035	
Total	23	41.746		

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}

EPA MRID Number 465789-41

Critical F value = 2.77 (0.05,5,18)

Since F > Critical F REJECT Ho:All groups equal

Onion mean plant height (cm), lbs ai/A; Day 21
File: 8941nh 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	8.300	8.300		
2	0.00174	8.825	8.825	-0.730	
3	0.00517	8.975	8.975	-0.938	
4	0.0150	9.450	9.450	-1.599	
5	0.0436	8.950	8.950	-0.904	
6	0.135	6.425	6.425	2.606	*

Dunnnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

Onion mean plant height (cm), lbs ai/A; Day 21
File: 8941nh 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	4			
2	0.00174	4	1.734	20.9	-0.525
3	0.00517	4	1.734	20.9	-0.675
4	0.0150	4	1.734	20.9	-1.150
5	0.0436	4	1.734	20.9	-0.650
6	0.135	4	1.734	20.9	1.875

Onion mean plant height (cm), lbs ai/A; Day 21
File: 8941nh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	8.300	8.300	8.900
2	0.00174	4	8.825	8.825	8.900
3	0.00517	4	8.975	8.975	8.900
4	0.0150	4	9.450	9.450	8.900
5	0.0436	4	8.950	8.950	8.900
6	0.135	4	6.425	6.425	6.425

Onion mean plant height (cm), lbs ai/A; Day 21
File: 8941nh Transform: NO TRANSFORMATION

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....} EPA MRID Number 465789-41
 WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	8.900				
0.00174	8.900	0.834		1.73	k= 1, v=18
0.00517	8.900	0.834		1.82	k= 2, v=18
0.0150	8.900	0.834		1.85	k= 3, v=18
0.0436	8.900	0.834		1.86	k= 4, v=18
0.135	6.425	2.607	*	1.87	k= 5, v=18

s = 1.017

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

Rice emergence (3), lbs ai/A; Day 21
 File: 8941re Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	10.000	10.000	58.000
2	0.00174	9.500	9.500	45.000
3	0.00517	9.750	9.750	47.000
4	0.0150	10.000	10.000	58.000
5	0.0436	9.500	9.500	45.000
6	0.135	9.750	9.750	47.000

Calculated H Value = 2.329 Critical H Value Table = 11.070
 Since Calc H < Crit H FAIL TO REJECT Ho: All groups are equal.

Rice emergence (3), lbs ai/A; Day 21
 File: 8941re Transform: NO TRANSFORMATION

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

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP						
				0	0	0	0	0	0	
2	0.00174	9.500	9.500	\						
5	0.0436	9.500	9.500	.	\					
3	0.00517	9.750	9.750	.	.	\				
6	0.135	9.750	9.750	.	.	.	\			
1	neg control	10.000	10.000	.	.	.	.	\
4	0.0150	10.000	10.000	.	.	.	.	.	\

* = significant difference (p=0.05) . = no significant difference
 Table q value (0.05,6) = 2.936 SE = 3.244

rice % survival
 File: 8941rs Transform: NO TRANSFORM

STEELS MANY-ONE RANK TEST - Ho: Control < Treatment

TRANSFORMED RANK CRIT.

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}			EPA MRID Number 465789-41			
GROUP	IDENTIFICATION	MEAN	SUM	VALUE	df	SIG
1	control	100.000				
2	0.00174	97.500	16.00	10.00	4.00	
3	0.00517	100.000	18.00	10.00	4.00	
4	0.0150	100.000	18.00	10.00	4.00	
5	0.0436	97.500	16.00	10.00	4.00	
6	0.135	100.000	18.00	10.00	4.00	

Critical values use k = 5, are 1 tailed, and alpha = 0.05

Rice mean dry weight (g), lbs ai/A; Day 21
 File: 8941rw Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	0.262	0.052	3.059
Within (Error)	18	0.312	0.017	
Total	23	0.575		

Critical F value = 2.77 (0.05,5,18)
 Since F > Critical F REJECT Ho:All groups equal

Rice mean dry weight (g), lbs ai/A; Day 21
 File: 8941rw Transform: NO TRANSFORMATION

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

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	0.608	0.608		
2	0.00174	0.465	0.465	1.551	
3	0.00517	0.555	0.555	0.569	
4	0.0150	0.610	0.610	-0.027	
5	0.0436	0.487	0.487	1.312	
6	0.135	0.307	0.307	3.268	*

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

Rice mean dry weight (g), lbs ai/A; Day 21
 File: 8941rw 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	4			
2	0.00174	4	0.222	36.6	0.143
3	0.00517	4	0.222	36.6	0.052

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}			EPA MRID Number 465789-41		
4	0.0150	4	0.222	36.6	-0.002
5	0.0436	4	0.222	36.6	0.121
6	0.135	4	0.222	36.6	0.301

Rice mean dry weight (g), lbs ai/A; Day 21
 File: 8941rw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	0.608	0.608	0.608
2	0.00174	4	0.465	0.465	0.543
3	0.00517	4	0.555	0.555	0.543
4	0.0150	4	0.610	0.610	0.543
5	0.0436	4	0.487	0.487	0.487
6	0.135	4	0.307	0.307	0.307

Rice mean dry weight (g), lbs ai/A; Day 21
 File: 8941rw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	0.608				
0.00174	0.543	0.691		1.73	k= 1, v=18
0.00517	0.543	0.691		1.82	k= 2, v=18
0.0150	0.543	0.691		1.85	k= 3, v=18
0.0436	0.487	1.299		1.86	k= 4, v=18
0.135	0.307	3.233	*	1.87	k= 5, v=18

s = 0.132
 Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.030	0.0033	0.27	0.46	0.11
EC10	0.043	0.0078	0.24	0.36	0.18
EC25	0.078	0.031	0.20	0.19	0.40
EC50	0.15	0.083	0.28	0.13	0.55

Slope = 2.34 Std.Err. = 1.66

Goodness of fit: p = 0.49 based on DF= 3.0 18.

8941RW : Rice mean dry weight (g), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. Mean - Pred. Mean	Pred. %Control	%Change
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Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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0.00	4.00	0.608	0.558	0.0499	100.	0.00
0.00174	4.00	0.465	0.558	-0.0931	100.	0.000274
0.00517	4.00	0.555	0.558	-0.00242	100.	0.0294
0.0150	4.00	0.610	0.553	0.0576	99.1	0.932
0.0436	4.00	0.487	0.501	-0.0138	89.7	10.3
0.135	4.00	0.306	0.305	0.00182	54.6	45.4

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

Rice mean plant height (cm), lbs ai/A; Day 21
 File: 8941rh Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	50.388	10.078	1.370
Within (Error)	18	132.385	7.355	
Total	23	182.773		

Critical F value = 2.77 (0.05,5,18)
 Since F < Critical F FAIL TO REJECT Ho:All groups equal

Rice mean plant height (cm), lbs ai/A; Day 21
 File: 8941rh 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	27.050	27.050		
2	0.00174	24.125	24.125	1.525	
3	0.00517	25.650	25.650	0.730	
4	0.0150	26.725	26.725	0.169	
5	0.0436	25.300	25.300	0.913	
6	0.135	22.850	22.850	2.190	

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

Rice mean plant height (cm), lbs ai/A; Day 21
 File: 8941rh 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	4			
2	0.00174	4	4.622	17.1	2.925
3	0.00517	4	4.622	17.1	1.400
4	0.0150	4	4.622	17.1	0.325
5	0.0436	4	4.622	17.1	1.750
6	0.135	4	4.622	17.1	4.200

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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Rice mean plant height (cm), lbs ai/A; Day 21
 File: 8941rh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	27.050	27.050	27.050
2	0.00174	4	24.125	24.125	25.500
3	0.00517	4	25.650	25.650	25.500
4	0.0150	4	26.725	26.725	25.500
5	0.0436	4	25.300	25.300	25.300
6	0.135	4	22.850	22.850	22.850

Rice mean plant height (cm), lbs ai/A; Day 21
 File: 8941rh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	27.050				
0.00174	25.500	0.808		1.73	k= 1, v=18
0.00517	25.500	0.808		1.82	k= 2, v=18
0.0150	25.500	0.808		1.85	k= 3, v=18
0.0436	25.300	0.913		1.86	k= 4, v=18
0.135	22.850	2.190	*	1.87	k= 5, v=18

s = 2.712

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

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.079	0.012	0.52	0.39	0.15
EC10	0.12	0.056	0.26	0.16	0.46
EC25	0.25	0.032	1.9	0.43	0.13
EC50	0.55	0.0058	51.	0.95	0.011

Slope = 1.96 Std.Err. = 3.06

Goodness of fit: p = 0.44 based on DF= 3.0 18.

8941RH : Rice mean plant height (cm), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	4.00	27.0	25.9	1.19	100.	0.00
0.00174	4.00	24.1	25.9	-1.73	100.	4.80e-05

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0.00517	4.00	25.6	25.9	-0.208	100.	0.00357
0.0150	4.00	26.7	25.8	0.894	99.9	0.109
0.0436	4.00	25.3	25.5	-0.155	98.4	1.56
0.135	4.00	22.9	22.8	0.0145	88.3	11.7

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

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

carrot % survival
File: 894lcs Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	349.708	69.942	0.761
Within (Error)	18	1654.250	91.903	
Total	23	2003.958		

Critical F value = 2.77 (0.05,5,18)
Since F < Critical F FAIL TO REJECT Ho:All groups equal

carrot % survival
File: 894lcs 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	control	95.750	95.750		
2	0.00174	87.250	87.250	1.254	
3	0.00517	94.500	94.500	0.184	
4	0.0150	97.000	97.000	-0.184	
5	0.0436	89.500	89.500	0.922	
6	0.135	97.250	97.250	-0.221	

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

carrot % survival
File: 894lcs 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	control	4			
2	0.00174	4	16.337	17.1	8.500

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}			EPA MRID Number 465789-41		
3	0.00517	4	16.337	17.1	1.250
4	0.0150	4	16.337	17.1	-1.250
5	0.0436	4	16.337	17.1	6.250
6	0.135	4	16.337	17.1	-1.500

carrot % survival
File: 8941cs Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	control	4	95.750	95.750	91.500
2	0.00174	4	87.250	87.250	91.500
3	0.00517	4	94.500	94.500	93.667
4	0.0150	4	97.000	97.000	93.667
5	0.0436	4	89.500	89.500	93.667
6	0.135	4	97.250	97.250	97.250

carrot % survival
File: 8941cs Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
control	91.500				
0.00174	91.500	0.627		1.73	k= 1, v=18
0.00517	93.667	0.307		1.82	k= 2, v=18
0.0150	93.667	0.307		1.85	k= 3, v=18
0.0436	93.667	0.307		1.86	k= 4, v=18
0.135	97.250	0.221		1.87	k= 5, v=18

s = 9.587

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

Carrot mean dry weight (mg), lbs ai/A; Day 21
File: 8941aw Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	2410.333	482.067	0.778
Within (Error)	18	11149.000	619.389	
Total	23	13559.333		

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Critical F value = 2.77 (0.05,5,18)

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

Carrot mean dry weight (mg), lbs ai/A; Day 21
File: 8941aw 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	53.250	53.250		
2	0.00174	72.250	72.250	-1.080	
3	0.00517	69.250	69.250	-0.909	
4	0.0150	59.000	59.000	-0.327	
5	0.0436	59.250	59.250	-0.341	
6	0.135	42.000	42.000	0.639	

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

Carrot mean dry weight (mg), lbs ai/A; Day 21
File: 8941aw 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	4			
2	0.00174	4	42.412	79.6	-19.000
3	0.00517	4	42.412	79.6	-16.000
4	0.0150	4	42.412	79.6	-5.750
5	0.0436	4	42.412	79.6	-6.000
6	0.135	4	42.412	79.6	11.250

Carrot mean dry weight (mg), lbs ai/A; Day 21
File: 8941aw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	53.250	53.250	64.917
2	0.00174	4	72.250	72.250	64.917
3	0.00517	4	69.250	69.250	64.917
4	0.0150	4	59.000	59.000	59.125
5	0.0436	4	59.250	59.250	59.125
6	0.135	4	42.000	42.000	42.000

Carrot mean dry weight (mg), lbs ai/A; Day 21

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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File: 8941aw

Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	64.917				
0.00174	64.917	0.663		1.73	k= 1, v=18
0.00517	64.917	0.663		1.82	k= 2, v=18
0.0150	59.125	0.334		1.85	k= 3, v=18
0.0436	59.125	0.334		1.86	k= 4, v=18
0.135	42.000	0.639		1.87	k= 5, v=18

s = 24.888

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

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.029	0.00042	2.1	0.89	0.014
EC10	0.046	0.0021	1.0	0.64	0.046
EC25	0.097	0.024	0.39	0.29	0.25
EC50	0.22	0.033	1.5	0.40	0.15

Slope = 1.86 Std.Err. = 2.48

Goodness of fit: p = 0.69 based on DF= 3.0 18.

8941AW : Carrot mean dry weight (mg), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	4.00	53.3	63.9	-10.7	100.	0.00
0.00174	4.00	72.3	63.9	8.30	100.	0.00429
0.00517	4.00	69.3	63.9	5.37	99.9	0.115
0.0150	4.00	59.0	63.0	-4.03	98.6	1.44
0.0436	4.00	59.3	58.0	1.23	90.7	9.27
0.135	4.00	42.0	42.2	-0.175	66.0	34.0

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

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

File: 8941ah Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	16.093	3.219	3.315
Within (Error)	18	17.485	0.971	
Total	23	33.578		

Critical F value = 2.77 (0.05,5,18)

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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Since $F > \text{Critical } F$ REJECT H_0 : All groups equal

Carrot mean plant height (cm), lbs ai/A; Day 21
File: 8941ah 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	5.875	5.875		
2	0.00174	6.650	6.650	-1.112	
3	0.00517	6.250	6.250	-0.538	
4	0.0150	5.800	5.800	0.108	
5	0.0436	6.425	6.425	-0.789	
6	0.135	4.150	4.150	2.476	*

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

Carrot mean plant height (cm), lbs ai/A; Day 21
File: 8941ah 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	4			
2	0.00174	4	1.679	28.6	-0.775
3	0.00517	4	1.679	28.6	-0.375
4	0.0150	4	1.679	28.6	0.075
5	0.0436	4	1.679	28.6	-0.550
6	0.135	4	1.679	28.6	1.725

Carrot mean plant height (cm), lbs ai/A; Day 21
File: 8941ah Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	5.875	5.875	6.263
2	0.00174	4	6.650	6.650	6.263
3	0.00517	4	6.250	6.250	6.250
4	0.0150	4	5.800	5.800	6.113
5	0.0436	4	6.425	6.425	6.113
6	0.135	4	4.150	4.150	4.150

Carrot mean plant height (cm), lbs ai/A; Day 21
File: 8941ah Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	6.263				
0.00174	6.263	0.556		1.73	k= 1, v=18
0.00517	6.250	0.538		1.82	k= 2, v=18
0.0150	6.113	0.341		1.85	k= 3, v=18
0.0436	6.113	0.341		1.86	k= 4, v=18
0.135	4.150	2.475	*	1.87	k= 5, v=18

s = 0.986

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

Mung bean mean dry weight (g), lbs ai/A; Day 21
File: 8941bw Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	0.248	0.050	0.595
Within (Error)	18	1.511	0.084	
Total	23	1.759		

Critical F value = 2.77 (0.05,5,18)

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

Mung bean mean dry weight (g), lbs ai/A; Day 21
File: 8941bw 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	2.190	2.190		
2	0.00174	1.957	1.957	1.139	
3	0.00517	2.154	2.154	0.176	
4	0.0150	2.130	2.130	0.292	
5	0.0436	2.195	2.195	-0.024	
6	0.135	1.957	1.957	1.136	

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

Mung bean mean dry weight (g), lbs ai/A; Day 21
File: 8941bw 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	4			
2	0.00174	4	0.494	22.6	0.234

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3	0.00517	4	0.494	22.6	0.036
4	0.0150	4	0.494	22.6	0.060
5	0.0436	4	0.494	22.6	-0.005
6	0.135	4	0.494	22.6	0.233

Mung bean mean dry weight (g), lbs ai/A; Day 21
 File: 8941bw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	2.190	2.190	2.190
2	0.00174	4	1.957	1.957	2.109
3	0.00517	4	2.154	2.154	2.109
4	0.0150	4	2.130	2.130	2.109
5	0.0436	4	2.195	2.195	2.109
6	0.135	4	1.957	1.957	1.957

Mung bean mean dry weight (g), lbs ai/A; Day 21
 File: 8941bw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	2.190				
0.00174	2.109	0.396		1.73	k= 1, v=18
0.00517	2.109	0.396		1.82	k= 2, v=18
0.0150	2.109	0.396		1.85	k= 3, v=18
0.0436	2.109	0.396		1.86	k= 4, v=18
0.135	1.957	1.136		1.87	k= 5, v=18

s = 0.290

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

Mung bean mean plant height (cm), lbs ai/A; Day 21
 File: 8941bh Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	2.222	0.444	0.505
Within (Error)	18	15.848	0.880	
Total	23	18.070		

Critical F value = 2.77 (0.05,5,18)

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

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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Mung bean mean plant height (cm), lbs ai/A; Day 21
 File: 8941bh Transform: NO TRANSFORMATION

DUNNETT'S TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	12.275	12.275		
2	0.00174	11.575	11.575	1.055	
3	0.00517	11.825	11.825	0.678	
4	0.0150	11.450	11.450	1.244	
5	0.0436	11.375	11.375	1.357	
6	0.135	11.525	11.525	1.131	

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

Mung bean mean plant height (cm), lbs ai/A; Day 21
 File: 8941bh Transform: NO TRANSFORMATION

DUNNETT'S 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	4			
2	0.00174	4	1.599	13.0	0.700
3	0.00517	4	1.599	13.0	0.450
4	0.0150	4	1.599	13.0	0.825
5	0.0436	4	1.599	13.0	0.900
6	0.135	4	1.599	13.0	0.750

Mung bean mean plant height (cm), lbs ai/A; Day 21
 File: 8941bh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	12.275	12.275	12.275
2	0.00174	4	11.575	11.575	11.700
3	0.00517	4	11.825	11.825	11.700
4	0.0150	4	11.450	11.450	11.450
5	0.0436	4	11.375	11.375	11.450
6	0.135	4	11.525	11.525	11.450

Mung bean mean plant height (cm), lbs ai/A; Day 21
 File: 8941bh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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Dose	Estimate	95% Lower Bound	95% Upper Bound	Std. Err.	Lower Bound / Estimate	k, v
neg control	12.275					
0.00174	11.700	0.867	1.73		k= 1, v=18	
0.00517	11.700	0.867	1.82		k= 2, v=18	
0.0150	11.450	1.243	1.85		k= 3, v=18	
0.0436	11.450	1.243	1.86		k= 4, v=18	
0.135	11.450	1.243	1.87		k= 5, v=18	

s = 0.938

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

Estimates of EC%

Parameter	Estimate	95% Lower Bound	95% Upper Bound	Std. Err.	Lower Bound / Estimate
EC5	0.0014	6.2E-15	3.3E+08	5.5	4.3E-12
EC10	61.	1.4E-18	2.7E+21	9.4	2.3E-20
EC25	3.3E+09	4.2E-52	2.5E+70	29.	1.3E-61
EC50	1.3E+18	1.6E-90	1.0E+126	52.	1.3E-108

Slope = 0.0785 Std.Err. = 0.208

Goodness of fit: p = 0.94 based on DF= 3.0 18.

8941BH : Mung bean mean plant height (cm), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. - Pred.	Pred. %Control	%Change
0.00	4.00	12.3	12.3	-0.000419	100.	0.00
0.00174	4.00	11.6	11.7	-0.0782	94.9	5.07
0.00517	4.00	11.8	11.6	0.221	94.5	5.47
0.0150	4.00	11.4	11.6	-0.103	94.1	5.88
0.0436	4.00	11.4	11.5	-0.125	93.7	6.32
0.135	4.00	11.5	11.4	0.0859	93.2	6.81

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

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

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

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

oilseed rape % survival

File: 8941ors Transform: NO TRANSFORM

STEELS MANY-ONE RANK TEST

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	RANK SUM	CRIT. VALUE	df	SIG
1	control	92.250				
2	0.00174	100.000	22.00	10.00	4.00	
3	0.00517	97.500	21.00	10.00	4.00	
4	0.0150	92.500	18.50	10.00	4.00	
5	0.0436	100.000	22.00	10.00	4.00	
6	0.135	100.000	22.00	10.00	4.00	

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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Critical values use $k = 5$, are 1 tailed, and $\alpha = 0.05$

Oilseed rape mean plant height (cm), lbs ai/A; Day 21
File: 8941ph Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	7.559	1.512	0.842
Within (Error)	18	32.317	1.795	
Total	23	39.876		

Critical F value = 2.77 (0.05,5,18)
Since $F < \text{Critical F}$ FAIL TO REJECT H_0 :All groups equal

Oilseed rape mean plant height (cm), lbs ai/A; Day 21
File: 8941ph Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 1 OF 2 H_0 :Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	21.250	21.250		
2	0.00174	21.000	21.000	0.264	
3	0.00517	19.650	19.650	1.689	
4	0.0150	20.600	20.600	0.686	
5	0.0436	20.350	20.350	0.950	
6	0.135	19.925	19.925	1.399	

Dunnett table value = 2.41 (1 Tailed Value, $P=0.05$, $df=18,5$)

Oilseed rape mean plant height (cm), lbs ai/A; Day 21
File: 8941ph Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 2 OF 2 H_0 :Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	4			
2	0.00174	4	2.283	10.7	0.250
3	0.00517	4	2.283	10.7	1.600
4	0.0150	4	2.283	10.7	0.650
5	0.0436	4	2.283	10.7	0.900
6	0.135	4	2.283	10.7	1.325

Oilseed rape mean plant height (cm), lbs ai/A; Day 21
File: 8941ph Transform: NO TRANSFORMATION

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	21.250	21.250	21.250
2	0.00174	4	21.000	21.000	21.000
3	0.00517	4	19.650	19.650	20.200
4	0.0150	4	20.600	20.600	20.200
5	0.0436	4	20.350	20.350	20.200
6	0.135	4	19.925	19.925	19.925

Oilseed rape mean plant height (cm), lbs ai/A; Day 21
 File: 8941ph Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	21.250				
0.00174	21.000	0.264		1.73	k= 1, v=18
0.00517	20.200	1.108		1.82	k= 2, v=18
0.0150	20.200	1.108		1.85	k= 3, v=18
0.0436	20.200	1.108		1.86	k= 4, v=18
0.135	19.925	1.398		1.87	k= 5, v=18

s = 1.340

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

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.039	8.7E-07	1.8E+03	2.2	2.2E-05
EC10	11.	2.1E-08	6.0E+09	4.2	1.9E-09
EC25	1.5E+05	2.1E-17	1.0E+27	10.	1.5E-22
EC50	5.3E+09	4.2E-28	6.7E+46	18.	7.9E-38

Slope = 0.148 Std.Err. = 0.241

Goodness of fit: p = 0.57 based on DF= 3.0 18.

8941PH : Oilseed rape mean plant height (cm), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	4.00	21.3	21.3	-0.00563	100.	0.00
0.00174	4.00	21.0	20.6	0.436	96.7	3.25
0.00517	4.00	19.6	20.4	-0.799	96.2	3.80
0.0150	4.00	20.6	20.3	0.279	95.6	4.40
0.0436	4.00	20.4	20.2	0.172	94.9	5.07
0.135	4.00	19.9	20.0	-0.0824	94.1	5.87

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

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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

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

Pea emergence (#), lbs ai/A; Day 21
 File: 894lee Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	9.750	9.750	52.500
2	0.00174	9.500	9.500	41.000
3	0.00517	9.250	9.250	49.000
4	0.0150	10.000	10.000	64.000
5	0.0436	9.750	9.750	52.500
6	0.135	9.500	9.500	41.000

Calculated H Value = 2.948 Critical H Value Table = 11.070
 Since Calc H < Crit H FAIL TO REJECT Ho: All groups are equal.

Pea emergence (#), lbs ai/A; Day 21
 File: 894lee Transform: NO TRANSFORMATION

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

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP						
				0	0	0	0	0	0	
3	0.00517	9.250	9.250	\						
2	0.00174	9.500	9.500	.	\					
6	0.135	9.500	9.500	.	.	\				
5	0.0436	9.750	9.750	.	.	.	\			
1	neg control	9.750	9.750	.	.	.	.	\
4	0.0150	10.000	10.000	.	.	.	.	.	\

* = significant difference (p=0.05) . = no significant difference
 Table q value (0.05,6) = 2.936 SE = 3.969

pea % survival
 File: 894lps Transform: NO TRANSFORM

STEELS MANY-ONE RANK TEST - Ho: Control < Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	RANK SUM	CRIT. VALUE	df	SIG
1	control	97.500				
2	0.00174	100.000	20.00	10.00	4.00	
3	0.00517	97.500	18.00	10.00	4.00	
4	0.0150	100.000	20.00	10.00	4.00	
5	0.0436	100.000	20.00	10.00	4.00	
6	0.135	92.500	17.50	10.00	4.00	

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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Critical values use k = 5, are 1 tailed, and alpha = 0.05

Pea mean dry weight (g), lbs ai/A; Day 21
File: 8941ew Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	4.129	0.826	2.394
Within (Error)	18	6.201	0.345	
Total	23	10.331		

Critical F value = 2.77 (0.05,5,18)
Since F < Critical F FAIL TO REJECT Ho:All groups equal

Pea mean dry weight (g), lbs ai/A; Day 21
File: 8941ew Transform: NO TRANSFORMATION

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

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	3.165	3.165		
2	0.00174	2.991	2.991	0.420	
3	0.00517	3.031	3.031	0.323	
4	0.0150	3.172	3.172	-0.017	
5	0.0436	2.775	2.775	0.938	
6	0.135	1.972	1.972	2.873	*

Dunnnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

Pea mean dry weight (g), lbs ai/A; Day 21
File: 8941ew 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	4			
2	0.00174	4	1.001	31.6	0.174
3	0.00517	4	1.001	31.6	0.134
4	0.0150	4	1.001	31.6	-0.007
5	0.0436	4	1.001	31.6	0.390
6	0.135	4	1.001	31.6	1.193

Pea mean dry weight (g), lbs ai/A; Day 21
File: 8941ew Transform: NO TRANSFORMATION

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}

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WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	3.165	3.165	3.165
2	0.00174	4	2.991	2.991	3.065
3	0.00517	4	3.031	3.031	3.065
4	0.0150	4	3.172	3.172	3.065
5	0.0436	4	2.775	2.775	2.775
6	0.135	4	1.972	1.972	1.972

Pea mean dry weight (g), lbs ai/A; Day 21
File: 8941ew Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	3.165				
0.00174	3.065	0.242		1.73	k= 1, v=18
0.00517	3.065	0.242		1.82	k= 2, v=18
0.0150	3.065	0.242		1.85	k= 3, v=18
0.0436	2.775	0.938		1.86	k= 4, v=18
0.135	1.972	2.875	*	1.87	k= 5, v=18

s = 0.587

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

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.031	0.0044	0.22	0.41	0.14
EC10	0.046	0.011	0.19	0.30	0.24
EC25	0.093	0.048	0.18	0.14	0.51
EC50	0.20	0.093	0.43	0.16	0.46

Slope = 2.02 Std.Err. = 1.27

Goodness of fit: p = 0.95 based on DF= 3.0 18.

8941EW : Pea mean dry weight (g), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	4.00	3.17	3.09	0.0737	100.	0.00
0.00174	4.00	2.99	3.09	-0.101	100.	0.00160
0.00517	4.00	3.03	3.09	-0.0585	99.9	0.0675
0.0150	4.00	3.17	3.06	0.117	98.8	1.15
0.0436	4.00	2.78	2.81	-0.0362	91.0	9.05
0.135	4.00	1.97	1.97	0.00521	63.6	36.4

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

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}

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

File: 8941eh Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	33.952	6.790	1.355
Within (Error)	18	90.188	5.010	
Total	23	124.140		

Critical F value = 2.77 (0.05,5,18)

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

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

File: 8941eh 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	13.600	13.600		
2	0.00174	13.000	13.000	0.379	
3	0.00517	14.325	14.325	-0.458	
4	0.0150	12.750	12.750	0.537	
5	0.0436	12.350	12.350	0.790	
6	0.135	10.500	10.500	1.959	

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

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

File: 8941eh 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	4			
2	0.00174	4	3.814	28.0	0.600
3	0.00517	4	3.814	28.0	-0.725
4	0.0150	4	3.814	28.0	0.850
5	0.0436	4	3.814	28.0	1.250
6	0.135	4	3.814	28.0	3.100

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

File: 8941eh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)

TABLE 1 OF 2

GROUP	ORIGINAL	TRANSFORMED	ISOTONIZED
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Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}			EPA MRID Number 465789-41			
IDENTIFICATION		N	MEAN	MEAN	MEAN	
1	neg control	4	13.600	13.600	13.642	
2	0.00174	4	13.000	13.000	13.642	
3	0.00517	4	14.325	14.325	13.642	
4	0.0150	4	12.750	12.750	12.750	
5	0.0436	4	12.350	12.350	12.350	
6	0.135	4	10.500	10.500	10.500	

Pea mean plant height (cm), lbs ai/A; Day 21
 File: 8941eh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	13.642				
0.00174	13.642	0.026		1.73	k= 1, v=18
0.00517	13.642	0.026		1.82	k= 2, v=18
0.0150	12.750	0.537		1.85	k= 3, v=18
0.0436	12.350	0.790		1.86	k= 4, v=18
0.135	10.500	1.959	*	1.87	k= 5, v=18

s = 2.238

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

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.023	0.00082	0.63	0.69	0.036
EC10	0.047	0.0055	0.40	0.45	0.12
EC25	0.16	0.050	0.49	0.24	0.32
EC50	0.60	0.031	12.	0.62	0.052

Slope = 1.15 Std.Err. = 0.994

Goodness of fit: p = 0.83 based on DF= 3.0 18.

8941EH : Pea mean plant height (cm), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	4.00	13.6	13.6	0.0228	100.	0.00
0.00174	4.00	13.0	13.6	-0.554	99.8	0.170
0.00517	4.00	14.3	13.5	0.864	99.1	0.856
0.0150	4.00	12.8	13.1	-0.391	96.8	3.22
0.0436	4.00	12.4	12.3	0.0522	90.6	9.42
0.135	4.00	10.5	10.5	0.00551	77.3	22.7

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

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

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

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}

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radish % survival
File: 8941ds Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	192.833	38.567	1.184
Within (Error)	18	586.500	32.583	
Total	23	779.333		

Critical F value = 2.77 (0.05,5,18)
Since F < Critical F FAIL TO REJECT Ho:All groups equal

radish % survival
File: 8941ds 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	control	92.250	92.250		
2	0.00174	97.500	97.500	-1.301	
3	0.00517	97.500	97.500	-1.301	
4	0.0150	92.250	92.250	0.000	
5	0.0436	90.000	90.000	0.557	
6	0.135	92.500	92.500	-0.062	

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

radish % survival
File: 8941ds 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	control	4			
2	0.00174	4	9.727	10.5	-5.250
3	0.00517	4	9.727	10.5	-5.250
4	0.0150	4	9.727	10.5	0.000
5	0.0436	4	9.727	10.5	2.250
6	0.135	4	9.727	10.5	-0.250

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}

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radish % survival
File: 8941ds Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	control	4	92.250	92.250	92.250
2	0.00174	4	97.500	97.500	93.950
3	0.00517	4	97.500	97.500	93.950
4	0.0150	4	92.250	92.250	93.950
5	0.0436	4	90.000	90.000	93.950
6	0.135	4	92.500	92.500	93.950

radish % survival
File: 8941ds Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
control	92.250				
0.00174	93.950	0.421		1.73	k= 1, v=18
0.00517	93.950	0.421		1.82	k= 2, v=18
0.0150	93.950	0.421		1.85	k= 3, v=18
0.0436	93.950	0.421		1.86	k= 4, v=18
0.135	93.950	0.421		1.87	k= 5, v=18

s = 5.708

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

File: 8941dw Transform: NO TRANSFORM

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	17.221	3.444	32.800
Within (Error)	18	1.893	0.105	
Total	23	19.115		

Critical F value = 2.77 (0.05,5,18)
Since F > Critical F REJECT Ho:All groups equal

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

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}

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File: 8941dw Transform: NO TRANSFORM

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

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	2.879	2.879		
2	0.00174	3.084	3.084	-0.896	
3	0.00517	3.149	3.149	-1.181	
4	0.0150	2.861	2.861	0.076	
5	0.0436	2.191	2.191	3.003	*
6	0.135	0.718	0.718	9.430	*

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

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

File: 8941dw Transform: NO TRANSFORM

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

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	4			
2	0.00174	4	0.552	19.2	-0.205
3	0.00517	4	0.552	19.2	-0.271
4	0.0150	4	0.552	19.2	0.018
5	0.0436	4	0.552	19.2	0.688
6	0.135	4	0.552	19.2	2.161

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

File: 8941dw Transform: NO TRANSFORM

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	2.879	2.879	3.037
2	0.00174	4	3.084	3.084	3.037
3	0.00517	4	3.149	3.149	3.037
4	0.0150	4	2.861	2.861	2.861
5	0.0436	4	2.191	2.191	2.191
6	0.135	4	0.718	0.718	0.718

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

File: 8941dw Transform: NO TRANSFORM

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	3.037				

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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0.00174	3.037	0.691		1.73	k= 1, v=18
0.00517	3.037	0.691		1.82	k= 2, v=18
0.0150	2.861	0.076		1.85	k= 3, v=18
0.0436	2.191	3.000	*	1.86	k= 4, v=18
0.135	0.718	9.422	*	1.87	k= 5, v=18

s = 0.324

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

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.017	0.010	0.029	0.11	0.59
EC10	0.024	0.015	0.037	0.094	0.64
EC25	0.040	0.029	0.055	0.066	0.73
EC50	0.072	0.060	0.088	0.040	0.83

Slope = 2.63 Std.Err. = 0.355

Goodness of fit: p = 0.72 based on DF= 3.0 18.

8941DW : Radish mean dry weight (g), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	4.00	2.88	3.02	-0.146	100.	0.00
0.00174	4.00	3.08	3.02	0.0594	100.	0.000999
0.00517	4.00	3.15	3.02	0.128	99.9	0.127
0.0150	4.00	2.86	2.92	-0.0549	96.4	3.58
0.0436	4.00	2.19	2.18	0.0153	71.9	28.1
0.135	4.00	0.718	0.720	-0.00248	23.8	76.2

Radish mean plant height (cm), lbs ai/A; Day 21
File: 8941dh Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	445.708	89.142	25.484
Within (Error)	18	62.970	3.498	
Total	23	508.678		

Critical F value = 2.77 (0.05,5,18)
Since F > Critical F REJECT Ho:All groups equal

Radish mean plant height (cm), lbs ai/A; Day 21
File: 8941dh Transform: NO TRANSFORMATION

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

TRANSFORMED MEAN CALCULATED IN

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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GROUP	IDENTIFICATION	MEAN	ORIGINAL UNITS	T STAT	SIG
1	neg control	15.550	15.550		
2	0.00174	15.850	15.850	-0.227	
3	0.00517	16.500	16.500	-0.718	
4	0.0150	15.800	15.800	-0.189	
5	0.0436	13.700	13.700	1.399	
6	0.135	4.150	4.150	8.620	*

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

Radish mean plant height (cm), lbs ai/A; Day 21
File: 8941dh 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	4			
2	0.00174	4	3.187	20.5	-0.300
3	0.00517	4	3.187	20.5	-0.950
4	0.0150	4	3.187	20.5	-0.250
5	0.0436	4	3.187	20.5	1.850
6	0.135	4	3.187	20.5	11.400

Radish mean plant height (cm), lbs ai/A; Day 21
File: 8941dh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	15.550	15.550	15.967
2	0.00174	4	15.850	15.850	15.967
3	0.00517	4	16.500	16.500	15.967
4	0.0150	4	15.800	15.800	15.800
5	0.0436	4	13.700	13.700	13.700
6	0.135	4	4.150	4.150	4.150

Radish mean plant height (cm), lbs ai/A; Day 21
File: 8941dh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	15.967				
0.00174	15.967	0.315		1.73	k= 1, v=18
0.00517	15.967	0.315		1.82	k= 2, v=18
0.0150	15.800	0.189		1.85	k= 3, v=18
0.0436	13.700	1.399		1.86	k= 4, v=18
0.135	4.150	8.620	*	1.87	k= 5, v=18

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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s = 1.870

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

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.030	0.017	0.052	0.11	0.58
EC10	0.038	0.024	0.060	0.097	0.63
EC25	0.057	0.041	0.078	0.067	0.72
EC50	0.088	0.073	0.11	0.039	0.83

Slope = 3.50 Std.Err. = 0.630

Goodness of fit: p = 0.94 based on DF= 3.0 18.

8941DH : Radish mean plant height (cm), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	4.00	15.6	15.9	-0.390	100.	0.00
0.00174	4.00	15.9	15.9	-0.0904	100.	1.16e-07
0.00517	4.00	16.5	15.9	0.560	100.	0.000789
0.0150	4.00	15.8	15.9	-0.0848	99.7	0.349
0.0436	4.00	13.7	13.7	0.00643	85.9	14.1
0.135	4.00	4.15	4.15	-0.000645	26.0	74.0

Soybean emergence (#), lbs ai/A; Day 21

File: 8941se Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	9.500	9.500	53.000
2	0.00174	9.750	9.750	64.500
3	0.00517	9.750	9.750	64.500
4	0.0150	9.000	9.000	30.000
5	0.0436	9.000	9.000	35.000
6	0.135	9.500	9.500	53.000

Calculated H Value = 6.817 Critical H Value Table = 11.070

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

Soybean emergence (#), lbs ai/A; Day 21

File: 8941se Transform: NO TRANSFORMATION

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

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP					
				0	0	0	0	0	
4	0.0150	9.000	9.000	4	5	1	6	3	2

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}

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5	0.0436	9.000	9.000	.	\
1	neg control	9.500	9.500	.	\
6	0.135	9.500	9.500	.	\
3	0.00517	9.750	9.750	.	\
2	0.00174	9.750	9.750	.	\

* = significant difference (p=0.05) . = no significant difference
 Table q value (0.05,6) = 2.936 SE = 4.416

soybean % survival
 File: 8941ss Transform: NO TRANSFORM

STEELS MANY-ONE RANK TEST - Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	RANK SUM	CRIT. VALUE	df	SIG
1	control	100.000				
2	0.00174	100.000	18.00	10.00	4.00	
3	0.00517	100.000	18.00	10.00	4.00	
4	0.0150	100.000	18.00	10.00	4.00	
5	0.0436	100.000	18.00	10.00	4.00	
6	0.135	97.250	16.00	10.00	4.00	

Critical values use k = 5, are 1 tailed, and alpha = 0.05

Soybean mean dry weight (g), lbs ai/A; Day 21
 File: 8941sw Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	6.778	1.356	2.961
Within (Error)	18	8.238	0.458	
Total	23	15.016		

Critical F value = 2.77 (0.05,5,18)
 Since F > Critical F REJECT Ho:All groups equal

Soybean mean dry weight (g), lbs ai/A; Day 21
 File: 8941sw 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	7.415	7.415		
2	0.00174	7.364	7.364	0.107	
3	0.00517	7.841	7.841	-0.889	
4	0.0150	6.548	6.548	1.813	
5	0.0436	6.641	6.641	1.619	

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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 6 0.135 6.403 6.403 2.115

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

Soybean mean dry weight (g), lbs ai/A; Day 21
 File: 8941sw 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	4			
2	0.00174	4	1.153	15.6	0.051
3	0.00517	4	1.153	15.6	-0.425
4	0.0150	4	1.153	15.6	0.868
5	0.0436	4	1.153	15.6	0.775
6	0.135	4	1.153	15.6	1.012

Soybean mean dry weight (g), lbs ai/A; Day 21
 File: 8941sw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	7.415	7.415	7.540
2	0.00174	4	7.364	7.364	7.540
3	0.00517	4	7.841	7.841	7.540
4	0.0150	4	6.548	6.548	6.594
5	0.0436	4	6.641	6.641	6.594
6	0.135	4	6.403	6.403	6.403

Soybean mean dry weight (g), lbs ai/A; Day 21
 File: 8941sw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	7.540				
0.00174	7.540	0.261		1.73	k= 1, v=18
0.00517	7.540	0.261		1.82	k= 2, v=18
0.0150	6.594	1.716		1.85	k= 3, v=18
0.0436	6.594	1.716		1.86	k= 4, v=18
0.135	6.403	2.116	*	1.87	k= 5, v=18

s = 0.677
 Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds	Std.Err.	Lower Bound
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Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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		Lower	Upper		/Estimate
EC5	0.0083	9.8E-05	0.71	0.93	0.012
EC10	0.037	0.0026	0.53	0.56	0.070
EC25	0.46	0.042	5.1	0.50	0.090
EC50	7.5	0.023	2.4E+03	1.2	0.0031

Slope = 0.557 Std.Err. = 0.376

Goodness of fit: p = 0.17 based on DF= 3.0 18.

8941SW : Soybean mean dry weight (g), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. - Pred.	Pred. %Control	%Change
0.00	4.00	7.42	7.54	-0.122	100.	0.00
0.00174	4.00	7.36	7.38	-0.0110	97.8	2.15
0.00517	4.00	7.84	7.24	0.599	96.1	3.92
0.0150	4.00	6.55	7.04	-0.488	93.4	6.65
0.0436	4.00	6.64	6.73	-0.0928	89.3	10.7
0.135	4.00	6.40	6.29	0.115	83.4	16.6

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

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

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

File: 8941sh Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	31.627	6.325	1.388
Within (Error)	18	82.052	4.558	
Total	23	113.680		

Critical F value = 2.77 (0.05,5,18)

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

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

File: 8941sh 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	27.450	27.450		
2	0.00174	28.525	28.525	-0.712	
3	0.00517	28.950	28.950	-0.994	
4	0.0150	26.825	26.825	0.414	
5	0.0436	27.550	27.550	-0.066	
6	0.135	25.425	25.425	1.341	

Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

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Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

Soybean mean plant height (cm), lbs ai/A; Day 21
File: 8941sh 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	4			
2	0.00174	4	3.638	13.3	-1.075
3	0.00517	4	3.638	13.3	-1.500
4	0.0150	4	3.638	13.3	0.625
5	0.0436	4	3.638	13.3	-0.100
6	0.135	4	3.638	13.3	2.025

Soybean mean plant height (cm), lbs ai/A; Day 21
File: 8941sh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	4	27.450	27.450	28.308
2	0.00174	4	28.525	28.525	28.308
3	0.00517	4	28.950	28.950	28.308
4	0.0150	4	26.825	26.825	27.188
5	0.0436	4	27.550	27.550	27.188
6	0.135	4	25.425	25.425	25.425

Soybean mean plant height (cm), lbs ai/A; Day 21
File: 8941sh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	28.308				
0.00174	28.308	0.569		1.73	k= 1, v=18
0.00517	28.308	0.569		1.82	k= 2, v=18
0.0150	27.188	0.174		1.85	k= 3, v=18
0.0436	27.188	0.174		1.86	k= 4, v=18
0.135	25.425	1.341		1.87	k= 5, v=18

s = 2.135

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

Estimates of EC%

Parameter	Estimate	95% Bounds Lower Upper	Std.Err.	Lower Bound /Estimate
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Data Evaluation Report on the Acute Toxicity of Orthosulfamuron to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}	EPA MRID Number 465789-41				
EC5	0.065	0.0095	0.45	0.40	0.15
EC10	0.15	0.048	0.45	0.23	0.32
EC25	0.56	0.021	15.	0.68	0.038
EC50	2.5	0.0042	1.5E+03	1.3	0.0017

Slope = 1.04 Std.Err. = 1.08

Goodness of fit: p = 0.53 based on DF= 3.0 18.

 8941SH : Soybean mean plant height (cm), lbs ai/A; Day 21

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	4.00	27.4	28.1	-0.666	100.	0.00
0.00174	4.00	28.5	28.1	0.424	99.9	0.0518
0.00517	4.00	29.0	28.0	0.909	99.7	0.264
0.0150	4.00	26.8	27.8	-0.996	99.0	1.05
0.0436	4.00	27.5	27.2	0.384	96.6	3.38
0.135	4.00	25.4	25.5	-0.0549	90.6	9.37

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

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

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