Data Summary and Review on the Acute Toxicity of AE C656948 SC 500A G (AI: Fluopyram) to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number {.....} **EPA MRID Number 47372350**

Data Requirement:	PMRA Data Code:	9.8.4 (TGAI) or 9.8.6 (EP)
	EPA DP Barcode:	353315
	OECD Data Point:	IIA 8.12 (TGAI) and IIIA 10.8.1.1 (EP)
	EPA Guideline:	850.4150 (122-2)

Test material: AE C656948 SC 500A G (AI: Fluopyram) **Purity:** 41%
Common name
Chemical name: IUPAC N-{2-[3-chloro-5-(trifluoromethyl)-2-pyridyl]ethyl}-α,α,α-trifluoro-o-toluamide
CAS name N-{2-[3-chloro-5-(trifluoromethyl)pyridin-2-yl)ethyl}-2-(trifluoromethyl)benzamide
CAS No. 658066-35-4
Synonyms

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

Company Code	{.....}	[For PMRA]
Active Code	{.....}	[For PMRA]
Use Site Category:	{.....}	[For PMRA]
EPA PC Code	080302	

CITATION: Bach, F. and D. Nguyen. 2007. AE C656948 SC 500A G: Effect on the vegetative vigour of ten species of non-target terrestrial plants (Tier 1). Unpublished study performed and sponsored by Bayer CropScience AG, Frankfurt, Germany. Study Identification No.: VV 07/038. Study completed December 13, 2007.

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EXECUTIVE SUMMARY:

The effect of AE C656948 SC 500A G (AI: Fluopyram) on the vegetative vigor of monocot (onion, *Allium cepa*; oat, *Avena sativa;* perennial ryegrass, *Lolium perenne*; and corn, *Zea mays*) and dicot (sugarbeet, *Beta vulgaris*; oilseed rape, *Brassica napus*; cucumber, *Cucumis sativus*; buckwheat, *Fagopyrum esculentum*; soybean, *Glycine max*; and sunflower, *Helianthus annuus*) crops was studied at nominal concentrations of 0 (negative control) and 0.222 lbs fluopyram/A.

The growth medium used in the test was natural soil (silt loam, pH 7.31, organic carbon 1.30%. On day 21 the surviving plants per pot were evaluated for measuring dry weight and height.

In the vegetative vigor test, survival was not affected by fluopyram treatment. Inhibition in dry weight was relatively mild across all treatments, with sugarbeet having the highest level of inhibition of 20.2% in comparison to the negative control. Inhibition in height was very mild across all treatments, with no species exhibiting inhibitions of ≥5% in comparison to the negative control.

The most sensitive monocot and dicot species could not be determined. The NOAEC and EC_{25} for all species was 0.222 and >0.222 lbs a.i./A, respectively.

There were no compound-related phytotoxic effects.

Maximum Labeled Rate: 0.222 lbs fluopyram/A

Results Synopsis

Monocot

EC_{50}/IC_{50}: >0.222 lbs a.i./A 95% C.I.: N/A
EC_{25}/IC_{25}: >0.222 lbs a.i./A 95% C.I.: N/A
EC_{05}/IC_{05} >0.222 lbs a.i./A 95% C.I.: N/A
NOAEC: 0.222 lbs a.i./A
Slope: N/A Std err: N/A
Most sensitive monocot: None
Most sensitive parameter: None

Dicot

EC_{50}/IC_{50}: >0.222 lbs a.i./A 95% C.I.: N/A
EC_{25}/IC_{25}: >0.222 lbs a.i./A 95% C.I.: N/A
EC_{05}/IC_{05} >0.222 lbs a.i./A 95% C.I.: N/A
NOAEC: 0.222 lbs a.i./A
Slope: N/A Std err: N/A
Most sensitive monocot: None
Most sensitive parameter: None

This toxicity study is classified as [enter acceptability classification, e.g., acceptable/unacceptable/supplementary) and satisfies/does not satisfy the guideline requirement for a Tier I terrestrial plant toxicity study.

Table 1 (Tier I studies). Summary of most sensitive parameters by species.

	Survival (%)			Dry weight (g)		
Species	**Control**	**Treatment**	**%difference**	**Control**	**Treatment**	**%difference**
Onion	100	100	0	0.682	0.660	3.3
Oat	100	100	0	1.878	1.779	5.3
Ryegrass	100	100	0	0.233	0.250	-7.4
Corn	100	100	0	2.971	2.790	6.1
Sugarbeet	100	100	0	3.256	2.599	20.2
Oilseed rape	100	100	0	2.948	2.796	5.2
Cucumber	100	100	0	2.638	2.594	1.7
Buckwheat	100	100	0	1.913	2.143	-12.0
Soybean	100	100	0	2.391	2.169	9.3
Sunflower	100	100	0	1.378	1.448	-5.1

	Height (cm)		
Species	**Control**	**Treatment**	**%difference**
Onion	31.7	30.8	2.9
Oat	88.7	90.9	-2.5
Ryegrass	37.6	38.0	-1.2
Corn	20	20	0
Sugarbeet	38.4	39.1	-1.7
Oilseed rape	38.2	41.2	-7.9
Cucumber	58.8	62.6	-6.5
Buckwheat	97.8	96.9	0.8
Soybean	63.7	62.9	1.3
Sunflower	14.3	15.3	-7.0

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: This study was conducted following US EPA 123-1 and the OECD Guideline for the testing of Chemicals: Terrestrial (Non-Target) Plant Test OECD 227: Vegetative Vigour Test (Tier 2; July 2006).

COMPLIANCE: Signed and dated No Data Confidentiality, GLP, and Quality Assurance statements were provided. A Signatures page and Certificate of Analysis were also provided. This study was conducted in compliance with the Principles of GLP, Annex 1 to Chemicals Act of Federal Republic of Germany, based on the OECD Principles of GLP (1997).

A. REPORTED MATERIALS:

1. Test Material AE C656948 SC 500A G (AI: Fluopyram)

Description: Beige suspension

Lot No./Batch No. : 2006-010316 (Batch no.)

Purity: 41%

Stability of compound under test conditions: An analysis of the application rate ranged from 97.9 to 100% of nominal, indicating that the test material was stable at the time of analysis. The date of analysis was not reported, so it was not clear if the compound was stable throughout the duration of the test.

Storage conditions of test chemicals: Test material was stored at 25 ± 5°C.

Table 2. Physical/chemical properties of AE C656948 SC 500A G (AI: Fluopyram).

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: Oat (*Avena sativa*; Family Poaceae; Flamings Stern), Perennial Ryegrass (*Lolium perenne*; Family Poaceae; Prana), Corn (*Zea mays*; Family Poaceae; Arsenal), and Onion (*Allium cepa*; Family Liliaceae; Braunschweiger blutrot)

Dicotyledonous species: Sugarbeet (*Beta vulgaris*; Family Chenopodiaceae; Mosaik), Oilseed rape (*Brassica napus*; Family Brassicaceae; Licapo), Cucumber (*Cucumis sativus*; Family Curcubiteae; Delikatess), Buckwheat (*Fagopyrum esculentum*; Family Polygonaceae; none), Soybean (G*lycine max*; Family Fabaceae; Erin), and Sunflower (*Helianthus annuus*; Family Asteraceae; Big Smile)

Seed source: Commercial sources via Bayer CropScience GmbH, now Bayer CropScience AG, Frankfurt, Germany.
Prior seed treatment/sterilization: Seeds were not treated with pesticides or repellents prior to test initiation.

Historical % germination of seed: Not reported.
Seed storage, if any: Seeds were stored in a plastic box in a refrigerator.

B. REPORTED STUDY DESIGN:

1. Experimental Conditions

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

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

c. Definitive Study

Table 3: Experimental Parameters - Vegetative Vigor

Parameters	**Vegetative Vigor**	
	Details	**Remarks** ***Criteria***
Duration of the test	21 days	
Number of seeds/plants replicate	4 plants per replicate pot	
Number of plants retained after thinning	4 plants.	
<u>Number of replicates</u> Control: Adjuvant control: Treated:	8 N/A 8	
<u>Test concentrations (lbs formulation/A)</u> Nominal: Measured:	0.222 lbs a.i./A It appeared that test material was analyzed for the active ingredient prior to test initiation.	
<u>Method and interval of analytical verification</u> LOQ: LOD:	N/A N/A	
Adjuvant (type, percentage, if used)	N/A	

Data Summary and Review on the Acute Toxicity of AE C656948 SC 500A G (AI: Fluopyram) to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number {.....} **EPA MRID Number 47372350**

Parameters	Vegetative Vigor	
	Details	**Remarks** ***Criteria***
Test container (pot) Size/Volume Material: (glass/polystyrene)	 10 and 13 cm diameter Plastic	
Growth facility	Glasshouse.	
Method/depth of seeding	Seeds were manually planted at unreported depths.	
Test material application Application time including the plant growth stage Number of application Application interval Method of application	 Test material was applied post-emergence at the 2 to 4 leaf growth stage. Each species was treated once. N/A; single application. Test material was sprayed on the soil surface using a Tracksprayer Schachtner SprayLab SLGH 2500 spray chamber equipped with an overhead nozzle that was positioned *ca*. 35 cm from the soil surface.	
Details of soil used Geographic location Depth of soil collection Soil texture % sand % silt % clay pH: % organic carbon CEC Moisture at 1/3 atm (%)	 Not reported. Not reported. Silt loam 16.7 59.1 24.2 7.31 1.30 Not reported. Not reported.	

Parameters	Vegetative Vigor	
	Details	Remarks *Criteria*
Details of nutrient medium, if used	N/A	
Watering regime and schedules Water source/type: Volume applied: Interval of application: Method of application:	Not reported. Not reported. Done when necessary after a daily spot check. Saucers (for bottom watering) filled to unreported depths.	
Any pest control method/fertilization, if used	The soil was fertilized with 2.4 g Blaukorn per L, and the plants were fertilized with 1 mL/pot of Universaldunger on days 7 and 14.	
Test conditions Temperature: Photoperiod: Light intensity and quality: Relative humidity:	23 ± 8°C during the day; 18 ± 8°C at night (actual values not reported) 16L:8D <15000 lux lamps turned on >50000 lux shading closes Natural sunlight was supplemented by artificial lighting. 27-92%	
Reference chemical (if used) Name: Concentrations:	N/A	
Other parameters, if any	None.	

2. Observations:

Table 4: Observation Parameters - Vegetative Vigor

Parameters	Vegetative Vigor

	Details	Remarks
Parameters measured (i.e., plant height, dry weight or other endpoints)	Phytotoxicity, growth stages, dry weight, height, and survival.	
Measurement technique for each parameter	Survival, phytoxicity, emergence, and growth stages were assessed visually. Dry weight determination procedures were not reported. Height was assessed by measuring from the soil surface to the tip of the longest leaf or top of the growing point.	
Observation intervals	Survival and phytoxicity were assessed at days 7, 14, and 21. Growth stages, dry weight, and height were assessed at study termination.	
Other observations, if any	None.	
Were raw data included?	Yes.	
Phytotoxicity rating system, if used	0%- No injury/effect; 10-20%- slight plant effect or moderate symptoms on a small area; 30-40%- moderate effect involving the whole plant or severe symptoms on a limited area; 50-60%- severe symptoms throughout whole plant with younger leaves developing normally; 70-80% - total plant symptoms with poor vigour; 100%- mortality	

II. REPORTED RESULTS:

A. REPORTED MORTALITY:

Vegetative Vigor:

Survival in the negative control was 100%, and treatment group survival was also 100% relative to the negative control.

Inhibition in dry weight was relatively mild across all treatments, with sugarbeet having the highest level of inhibition of 20.2% in comparison to the negative control. Inhibition in height was very mild across all treatments, with no species exhibiting inhibitions of ≥5% in comparison to the negative control.

The study authors used a standard phytotoxicity rating system. No phytotoxic effects were observed. The authors also evaluated the growth stages of the plants, which were not explained. On day 21, growth stages ranged from 17-61 across all species.

B. REPORTED SUBLETHAL TOXICITY ENDPOINTS:

The study authors reported that there were no adverse effects on seedling survival, height, weight, or phytotoxicity. Therefore, the NOAEC and EC_{25} values are 0.222 lbs a.i./A and >0.222 lbs a.i./A, respectively.

C. REPORTED STATISTICS:

The study authors did not report how they conducted statistical analyses.

Table 5: Reported effect of AE C656948 SC 500A G (AI: Fluopyram) on Vegetative Vigor.

Species	Results summary for dry weight (lbs fluopyram/A)									
	Weight (g)	NOAEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI	slope	Std err
Onion	0.350-0.931	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Oat	1.547-2.221	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Ryegrass	0.221-0.302	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Corn	2.378-3.590	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Sugarbeet	1.740-3.772	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Oilseed rape	2.295-3.320	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Cucumber	1.663-3.247	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Buckwheat	1.330-3.513	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Soybean	1.413-2.734	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Sunflower	0.960-2.333	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A

Table 5a: Reported effect of AE C656948 SC 500A G (AI: Fluopyram) on Vegetative Vigor.

Species	Results summary for height (lbs fluopyram/A)									
	Height (cm)	NOAEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI	slope	Std err
Onion	29.3-32.5	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Oat	84.0-97.8	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Ryegrass	35.8-40.3	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Corn	93.5-101.3	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Sugarbeet	37.5-42.0	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Oilseed rape	36.8-45.8	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Cucumber	60.3-65.8	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Buckwheat	94.0-101.3	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Soybean	61.3-66.0	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Sunflower	13.0-17.5	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A

Table 5b: Reported effect of AE C656948 SC 500A G (AI: Fluopyram) on Vegetative Vigor.

Species	Results summary for survival (lbs fluopyram/A)									
	%	NOAEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI	slope	Std err
Onion	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Oat	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Ryegrass	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Corn	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Sugarbeet	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Oilseed rape	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Cucumber	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Buckwheat	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Soybean	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Sunflower	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A

Plant Injury Index										
Negative Control	Onion	Oat	Ryegrass	Corn	Sugarbeet	Oilseed rape	Cucumber	Buckwheat	Soybean	Sunflower
0	0	0	0	0	0	0	0	0	0	0

0%- No injury/effect; 10-20%- slight plant effect or moderate symptoms on a small area; 30-40%- moderate effect involving the whole plant or severe symptoms on a limited area; 50-60%- severe symptoms throughout whole plant with younger leaves developing normally; 70-80% - total plant symptoms with poor vigour; 100%- mortality

III. REVIEWER'S EVALUATION:

A. DEVIATIONS FROM GUIDELINES:

Temperature and humidity data were not reported.

Four plants were retained after thinning per replicate; five plants per replicate are recommended.

It did not appear that the cold vs. warm-loving species were separated.

The physico-chemical properties of the test material were not reported.

Historical germination for the seeds was not reported.

B. OTHER STUDY DEFICIENCIES:

There were no study deficiencies that would impact the results of the study.

C. VERIFICATION OF STATISTICAL RESULTS:

Any species exhibiting an inhibition of 5% in survival or dry weight relative to the negative control was statistically analyzed using a t-test for two samples assuming equal variance. If inhibitions were <5% at the treatment level relative to the negative control, the reviewer visually determined that no significant differences were present. All analyses were conducted using the nominal application rate of 0.222 lbs a.i./A.

Table 6: Effect of AE C656948 SC 500A G (AI: Fluopyram) on Vegetative Vigor.

Species	**Results summary for dry weight (lbs fluopyram/A)**									
	Weight (g)	NOEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI	slope	Std err
Onion	0.350-0.931	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Oat	1.547-2.221	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Ryegrass	0.221-0.302	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Corn	2.378-3.590	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Sugarbeet	1.740-3.772	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Oilseed rape	2.295-3.320	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Cucumber	1.663-3.247	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Buckwheat	1.330-3.513	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Soybean	1.413-2.734	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Sunflower	0.960-2.333	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A

Table 6a: Effect of AE C656948 SC 500A G (AI: Fluopyram) on Vegetative Vigor.

Species	Results summary for height (lbs fluopyram/A)									
	Height (cm)	NOEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI	slope	Std err
Onion	29.3-32.5	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Oat	84.0-97.8	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Ryegrass	35.8-40.3	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Corn	93.5-101.3	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Sugarbeet	37.5-42.0	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Oilseed rape	36.8-45.8	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Cucumber	60.3-65.8	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Buckwheat	94.0-101.3	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Soybean	61.3-66.0	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Sunflower	13.0-17.5	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A

Table 6b: Effect of AE C656948 SC 500A G (AI: Fluopyram) on Vegetative Vigor.

Species	Results summary for survival (lbs fluopyram/A)									
	%	NOEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI	slope	Std err
Onion	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Oat	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Ryegrass	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Corn	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Sugarbeet	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Oilseed rape	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Cucumber	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Buckwheat	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Soybean	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A
Sunflower	100	0.222	>0.222	N/A	>0.222	N/A	>0.222	N/A	N/A	N/A

Plant Injury Index										
Negative Control	Onion	Oat	Ryegrass	Corn	Sugarbeet	Oilseed rape	Cucumber	Buckwheat	Soybean	Sunflower
0	0	0	0	0	0	0	0	0	0	0

0%- No injury/effect; 10-20%- slight plant effect or moderate symptoms on a small area; 30-40%- moderate effect involving the whole plant or severe symptoms on a limited area; 50-60%- severe symptoms throughout whole plant with younger leaves developing normally; 70-80% - total plant symptoms with poor vigour; 100%- mortality

Monocot

EC_{50}/IC_{50}: >0.222 lbs a.i./A 95% C.I.: N/A
EC_{25}/IC_{25}: >0.222 lbs a.i./A 95% C.I.: N/A
EC_{05}/IC_{05} >0.222 lbs a.i./A 95% C.I.: N/A
NOAEC: 0.222 lbs a.i./A
Slope: N/A Std err: N/A
Most sensitive monocot: None
Most sensitive parameter: None

Dicot

EC_{50}/IC_{50}: >0.222 lbs a.i./A 95% C.I.: N/A
EC_{25}/IC_{25}: >0.222 lbs a.i./A 95% C.I.: N/A
EC_{05}/IC_{05} >0.222 lbs a.i./A 95% C.I.: N/A
NOAEC: 0.222 lbs a.i./A
Slope: N/A Std err: N/A
Most sensitive monocot: None
Most sensitive parameter: None

D. ADDITIONAL REVIEWER COMMENTS:

While sugarbeet weight exhibited an inhibition of 20.2%, the t-test was not able to detect a significant difference between the treatment group and the control. It is possible that the NOAEC for this endpoint is <0.222 lbs a.i./A.

The study authors also used BBCH-Monograph growth stages as an endpoint; no further information about this assessment index was reported.

The most sensitive monocot could not be determined, as every monocot treatment group either did not exhibit ≥5% inhibition, or when evaluated with a T-test did not show significant differences from the control.

The study authors' and the reviewer's results were in agreement.

All species had 100% survival, therefore endpoint values were visually determined.

E. CONCLUSIONS: Indicate if the study is acceptable/unacceptable/supplementary. The most sensitive monocot and dicot species could not be determined. The NOAEC and EC_{25} for all species was 0.222 and >0.222 lbs a.i./A, respectively.

Most sensitive monocot and EC_{25}: None, >0.222 lbs a.i./A

Most sensitive dicot and EC_{25}: None, >0.222 lbs a.i./A

III. REFERENCES:

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Federal Seed Act Regulation, 7 CFR, parts 201-202.

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OECD (July 2006, Adopted): Guideline for the testing of chemicals, Terrestrial Plant Test: Seedling Emergence and Seedling Growth Test.

The OECD Principles of Good Laboratory Practice, adopted by Council on 26th November 1997 [C(97)186/Final], Environment Directorate, Organisation for Economic Cooperation and Development, Paris 1998.

APPENDIX I. OUTPUT OF REVIEWER'S STATISTICAL VERIFICATION:

t-Test: Two-Sample Assuming Equal Variances

Sugarbeet Dry Weight (g)	***Neg control***	***0.222 lbs ai/A***
Mean	3.255875	2.599375
Variance	0.330681268	0.545367696
Observations	8	8
Pooled Variance	0.438024482	
Hypothesized Mean Difference	0	
df	14	
t Stat	1.983880614	
P(T<=t) one-tail	0.033616196	
t Critical one-tail	1.761310115	
P(T<=t) two-tail	0.067232392	
t Critical two-tail	2.144786681	

t-Test: Two-Sample Assuming Equal Variances

Oilseed Rape Dry Weight	***Neg control***	***0.222 lbs ai/A***
Mean	2.948125	2.796375
Variance	0.252493839	0.148864554
Observations	8	8
Pooled Variance	0.200679196	
Hypothesized Mean Difference	0	
df	14	
t Stat	0.677497222	
P(T<=t) one-tail	0.254566231	
t Critical one-tail	1.761310115	
P(T<=t) two-tail	0.509132461	
t Critical two-tail	2.144786681	

t-Test: Two-Sample Assuming Equal Variances

Soybean Dry Weight	***Neg control***	***0.222 lbs ai/A***
Mean	2.391	2.16925
Variance	0.166742857	0.179273929
Observations	8	8
Pooled Variance	0.173008393	
Hypothesized Mean Difference	0	
df	14	
t Stat	1.066252441	
P(T<=t) one-tail	0.15217644	
t Critical one-tail	1.761310115	
P(T<=t) two-tail	0.304352881	
t Critical two-tail	2.144786681	

t-Test: Two-Sample Assuming Equal Variances

Oat Dry Weight (g)	***Neg control***	***0.222 lbs ai/A***
Mean	1.878375	1.779375
Variance	0.069275411	0.043931125
Observations	8	8
Pooled Variance	0.056603268	
Hypothesized Mean Difference	0	
df	14	
t Stat	0.832232052	
P(T<=t) one-tail	0.209624113	
t Critical one-tail	1.761310115	
P(T<=t) two-tail	0.419248226	
t Critical two-tail	2.144786681	

t-Test: Two-Sample Assuming Equal Variances

Corn Dry Weight (g)	***Neg control***	***0.222 lbs ai/A***
Mean	2.97125	2.79025
Variance	0.1018145	0.152305929
Observations	8	8
Pooled Variance	0.127060214	
Hypothesized Mean Difference	0	
df	14	
t Stat	1.015555772	
P(T<=t) one-tail	0.163535682	
t Critical one-tail	1.761310115	
P(T<=t) two-tail	0.327071364	
t Critical two-tail	2.144786681	