

Data Evaluation Report on the Acute Toxicity of Propamocarb-fosetylolate SL 840 to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....} EPA MRID Number 47370502

Data Requirement: PMRA Data Code: 9.8.4 (TGAI) or 9.8.6 (EP)
EPA DP Barcode: 352522
OECD Data Point: IIA 8.12 (TGAI) and IIIA 10.8.1.1 (EP)
EPA Guideline: 850.4100

Test material: Propamocarb-fosetylolate SL 840 Purity: 29.9% Fosetyl-AL & 57.8% Propamocarb-hydrochloride

Common name
Chemical name: IUPAC: Not reported
CAS name: Not reported
CAS No.: Not reported
Synonyms: Not reported

Primary Reviewer: Brian D. Kiernan
EPA

Date: 7/09/08

Handwritten signature and date: BDK 8/13/08

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Date Evaluation Completed: 7/09/08

CITATION: Nguyen, D.H. and H. Gosch. 2005. Non-target terrestrial plants: an evaluation of the effects of Propamocarb-fosetylolate SL 840 in the seedling emergence test (Tier I). Unpublished study performed and sponsored by Bayer CropScience GmbH, Frankfurt, Germany. Laboratory report no.: SE05/01 – Tier I. Study completed August 16, 2005.

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 effect of propamocarb-fosetyl-AL SL 840 (AIs: Propamocarb, 57.8% and Fosetyl-AL, 29.9%) on the seedling emergence of monocot (corn, *Zea mays*; oat, *Avena sativa*; and shattercane, *Sorghum vulgare*) and dicot (sunflower, *Helianthus annuus L.*; oilseed Rape, *Brassica rapa*; sugarbeet, *Beta vulgaris*; cucumber, *Cucumis sativus*; and soybean, *Glycine max*) crops was studied at nominal concentrations of 0 and 2.5 lbs formulation/A (equivalent to 1.44 lbs Propamocarb/A). The growth medium used in the seedling emergence test was standard sterilized soil (14.2% sand, 65.1% silt, and 20.7% clay, pH 7.4, and 1.19% organic carbon). Fourteen days after 65% of the seedlings had emerged, the surviving plants per pot were recorded and measured for dry weight.

Dry weight was significantly inhibited in corn and cucumber 21 and 22%, relative to the control. The % inhibition in seedling emergence in the treated species as compared to the control ranged from -11 to 21%. Survival was 100% across all species.

Despite appreciable reductions in dry weight in five of the nine test species, no species exhibited statistically significant inhibition in excess of 25%, so Tier II testing is not required according to OPPTS Guidelines. The NOAEC and EC₂₅ values were <2.5 and >2.5 lbs formulation/A (equivalent to <1.44 and >1.44 lbs Propamocarb/A).

An observed increase in dry weight of 23% was reported for oilseed rape. However, it is not clear whether this increase in biomass is beneficial. Had plant height, a recommended endpoint, been measured, it may have been possible to characterize this hormetic effect.

This study is classified as 'unacceptable' based on its failure to address GLP satisfactorily. Should the registrant provide a detailed delineation and description of how the study deviated from GLP, this study could be upgraded to 'supplemental', as it contains some information that could be used in a risk assessment. However, due to the effects seen at the limit dose, this study is not useful for the purposes of an endangered species assessment. High variability among replications for many species in this study limits the ability to detect statistically significant differences (i.e. the power of the study). Additionally, the failure of the study to evaluate potential effects to plant height limits the utility of this study.

Results Synopsis

Formulation

Monocot and Dicot

EC₅₀/IC₅₀: >2.5 lbs formulation/A 95% C.I.: N/A
EC₂₅/IC₂₅: >2.5 lbs formulation/A 95% C.I.: N/A
NOAEC: <2.5 lbs formulation/A)
Slope: N/A Std err: N/A
Most sensitive: corn and cucumber
Most sensitive parameter: dry weight

Fosetyl-AL

Monocot and Dicot

EC₅₀/IC₅₀: >0.75 lbs Fosetyl-AL/A 95% C.I.: N/A
EC₂₅/IC₂₅: >0.75 lbs Fosetyl-AL/A 95% C.I.: N/A
NOAEC: <0.75 lbs Fosetyl-AL/A

Propamocarb-hydrochloride

Monocot and Dicot

EC₅₀/IC₅₀: >1.44 lbs Propamocarb/A 95% C.I.: N/A

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EC₂₅/IC₂₅: >1.44 lbs Propamocarb /A 95% C.I.: N/A

EC₀₅/IC₀₅: <1.44 lbs Propamocarb/A 95% C.I.: N/A

NOAEC: <1.44 lbs Propamocarb/A (corn and cucumber)

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

Species	Emergence			Survival		
	Control	Treatment	%difference	Control	Treatment	%difference
Corn	20	19	5	20	19	0
Oat	19	15	21	19	15	0
Shattercane	14	14	0	14	14	0
Sugarbeet	18	20	-11	18	20	0
Cucumber	14	15	-7	14	15	0
Sunflower	16	17	-6	16	17	0
Soybean	19	16	16	19	16	0
Oilseed rape	19	18	5	19	18	0

Species	Dry weight (g)		
	Control	Treatment	%difference
Corn	0.560	0.445	21
Oat	0.107	0.092	14
Shattercane	0.152	0.108	29
Sugarbeet	0.206	0.153	25
Cucumber	0.510	0.399	22
Sunflower	0.278	0.273	2
Soybean	0.279	0.270	3
Oilseed rape	0.231	0.284	-23

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I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: This study was conducted following the OECD draft (July 2000) Guideline for the Testing of Chemicals, Proposal for Updating Guideline 208, Terrestrial (Non-target) Plant Test: 208 A: Seeding Emergence and Seedling Growth Test. The following deviations from OPPTS 850.4100 were noted:

1. The study was not conducted in accordance with FIFRA GLP and no description of how the study deviated from GLP was provided.
2. The guideline number of species (10) was not tested.
3. Plant height was not assessed.
4. All species were tested under similar environmental conditions instead of separating the warm-loving species from the cold-loving species.
5. The physiochemical properties of the test material were not reported.
6. Only four dicots were tested; OPPTS guidelines state that a minimum of six dicots from four families should be used.
7. The moisture (% at 1/3 atm) of the soil was not reported.

These deviations affect the classification of this study.

COMPLIANCE: Signed and dated No Data Confidentiality and GLP statements were provided. This study was **not** conducted in compliance with any GLP standards, due to the study authors' assertion that GLP standards are not required. No detailed description of how the study deviated from GLP was provided.

A. MATERIALS:

1. Test Material Propamocarb-fosetylolate SL 840

Description: clear, colorless liquid

Lot No./Batch No. : ECCA000002 (Batch no.)

Purity: 29.9% Fosetyl-AL &
57.8% Propamocarb-hydrochloride

Stability of compound under test conditions: Not reported.
(*OECD recommends chemical stability in water and light*)

Storage conditions of test chemicals: Test material was stored at room temperature.

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Table 2. Physical/chemical properties of Propamocarb-fosetylolate SL 840.

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; Arsenal), Oat (*Avena sativa*; Family Poaceae; Flamings Stern), and Shattercane (*Sorghum vulgare*; Family Poaceae; Piper)

EPA recommends four monocots in two families, including corn.

Dicotyledonous species: Sunflower (*Helianthus annuus L.*; Family Asteraceae; Big Smile), Oilseed Rape (*Brassica rapa*; Family Brassicaceae; Licapo), Sugarbeet, (*Beta vulgaris*; Family Chenopodiaceae; Achat), Cucumber (*Cucumis sativus*; Family Curcubitaceae; Delikatess), and Soybean (*Glycine max*; Family Fabaceae; Erin); *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: Commercial sources via Bayer CropScience GmbH, Horticulture, H872, 65926 Frankfurt am Main

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. STUDY DESIGN:

1. Experimental Conditions

- a. Limit test: The definitive study was a Tier I limit test for the formulation.
- b. Range-finding study: A range finding study was not conducted.
- 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	14 days after 65% emergence.	<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	There were four replicates per species tested, and each replicate consisted of a single pot, with 5 seeds per pot.	<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: Adjuvant control: Treated:	4 N/A 4	<p>A negative, deionized water control was used in this study.</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 formulation/A)</u> Nominal: Measured:	2.5 lbs formulation/A Test material was not analyzed.	<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> LOQ: LOD:	N/A	
Adjuvant (type, percentage, if used)	N/A	

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Parameters	Seedling Emergence	
	Details	Remarks
	Criteria	
<u>Test container (pot)</u> Size/Volume Material: (glass/polystyrene)	10 cm diameter plastic	<hr style="border-top: 1px dashed black;"/> Non-porous containers should be used. OECD recommends that non-porous plastic or glazed pot be used.
Growth facility	Greenhouse	
Method/depth of seeding	Seeds were manually planted in the soil, and covered with 2-5 mm of soil.	
<u>Test material application</u> Application time including the plant growth stage Number of application Application interval Method of application	Test material was applied at time 0. Each species was treated once N/A; single application Test material was sprayed on the soil surface.	
<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. 14.2 65.1 20.7 7.4 1.19 Not reported. Not reported.	<hr style="border-top: 1px dashed black;"/> 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. 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.

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Parameters	Seedling Emergence	
	Details	Remarks
		Criteria
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:	Not reported. Not reported. Done when necessary after a daily spot check. Saucers (for bottom watering) filled to unreported depths.	----- <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	2.4 g Blaukorn per L applied to the soil.	
<u>Test conditions</u> Temperature: Photoperiod: Light intensity and quality: Relative humidity:	13-28°C 16L:8D >10000 lux lamps off, >20000 lux shading closed. Natural daylight was supplemented by artificial lighting. Not reported.	----- <i>EPA prefers that the cold vs warm loving plants be tested in two separate groups to optimize plant growth.</i> <i>OECD prefers that the temperature, humidity and light conditions are suitable for maintaining normal growth of each species for the test period.</i>
<u>Reference chemical (if used)</u> Name: Concentrations:	N/A	
Other parameters, if any	None.	

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2. Observations:

Table 4: Observation Parameters - Seedling Emergence.

Parameters	Seedling Emergence	
	Details	Remarks
Parameters measured (e.g., number of germinated seeds, emerged seedlings, plant height, dry weight or other endpoints)	Emergence, survival, phytotoxicity, biomass, and growth stages.	
Measurement technique for each parameter	Emergence, survival, phytotoxicity, and growth stages were assessed visually. Dry weight measurement techniques were not described.	
Observation intervals	Emergence and phytotoxicity were assessed at 7 and 14 days after 65% germination. Dry weight, survival, and growth stages were determined at test termination.	
Other observations, if any	None.	
Were raw data included?	Raw data were included for dry weight and emergence.	
Phytotoxicity rating system, if used	Reported as EPPO Standard 135; no further information provided.	

II. RESULTS and DISCUSSION:

A. INHIBITORY EFFECTS:

1. Seedling Emergence:

Negative control emergence ranged from 70% to 100% for all species tested and treatment group emergence ranged from 70% to 100% relative to the negative control.

Survival in the negative control was 100%, and treatment group survival was also 100% relative to the negative control. There was no inhibition in survival across all plant treatments.

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Inhibition in dry weight ranged from -23 to 29% of control, with shattercane having the highest level of inhibition (but it was not statistically significant from control). The study author's analysis detected significant inhibition for cucumber dry weight.

The study authors explained that visual phytotoxicity ratings were recorded (e.g., chlorosis, necrosis, stunting, abnormal growth) 7 and 14 days after emergence of 65% of seeds in the controls; however, there were no cases of observed phytotoxicity.

B. REPORTED STATISTICS:

Statistical analyses were conducted on the control and treatment groups using the Pairwise Mann-Whitney-U test (one sided smaller) at the 95% confidence limit.

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Table 5: Reported effect of Propamocarb-fosetylalate SL 840 on Seedling Emergence.

Species	Results summary for biomass (lbs formulation/A)									
	weight*	NOAEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	slope	Std err
Corn	0.338-0.647	2.5	ND	ND	ND	ND	ND	ND	ND	ND
Oat	0.062-0.119	2.5	ND	ND	ND	ND	ND	ND	ND	ND
Shattercane	0.058-0.199	2.5	ND	ND	ND	ND	ND	ND	ND	ND
Sugarbeet	0.125-0.285	2.5	ND	ND	ND	ND	ND	ND	ND	ND
Cucumber	0.315-0.546	<2.5	ND	ND	ND	ND	ND	ND	ND	ND
Sunflower	0.239-0.325	2.5	ND	ND	ND	ND	ND	ND	ND	ND
Soybean	0.237-0.312	2.5	ND	ND	ND	ND	ND	ND	ND	ND
Oilseed rape	0.225-0.339	2.5	ND	ND	ND	ND	ND	ND	ND	ND

ND- not determined

*weight data are corrected on a per plant basis.

Table 5a: Reported effect of Propamocarb-fosetylalate SL 840 on Seedling Emergence.

Species	Results summary for survival (lbs formulation/A)									
	%	NOAEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	slope	Std err
Corn	100	2.5	ND	ND	ND	ND	ND	ND	ND	ND
Oat	100	2.5	ND	ND	ND	ND	ND	ND	ND	ND
Shattercane	100	2.5	ND	ND	ND	ND	ND	ND	ND	ND
Sugarbeet	100	2.5	ND	ND	ND	ND	ND	ND	ND	ND
Cucumber	100	2.5	ND	ND	ND	ND	ND	ND	ND	ND
Sunflower	100	2.5	ND	ND	ND	ND	ND	ND	ND	ND
Soybean	100	2.5	ND	ND	ND	ND	ND	ND	ND	ND
Oilseed rape	100	2.5	ND	ND	ND	ND	ND	ND	ND	ND

ND - not determined.

Mid-study emergence								
Control	Corn	Oat	Shattercane	Sugarbeet	Cucumber	Sunflower	Soybean	Oilseed rape
70-100	100	95	70	90	70	80	95	95

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Plant Injury Index*								
Control	Corn	Oat	Shattercane	Sugarbeet	Cucumber	Sunflower	Soybean	Oilseed rape
0	0	0	0	0	0	0	0	0

*A description of the rating system used was not provided.

C. VERIFICATION OF STATISTICAL RESULTS BY THE REVIEWER:

Any species exhibiting an inhibition of 5% in survival or dry weight relative to the negative control was statistically analyzed using a one-sided t-test for two samples assuming unequal variance (equal variances for corn). If inhibitions were <5% at the blank control level or 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 2.5 lbs formulation/A.

Table 6: Effect of Propamocarb-fosetylolate SL 840 on Seedling Emergence

Species	Results summary for biomass (lbs formulation/A)									
	weight*	NOAEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	slope	Std err
Corn	0.338-0.647	<2.5	<2.5	N/A	>2.5	N/A	>2.5	N/A	N/A	N/A
Oat	0.062-0.119	2.5	<2.5	N/A	>2.5	N/A	>2.5	N/A	N/A	N/A
Shattercane	0.058-0.199	2.5	<2.5	N/A	≥2.5	N/A	>2.5	N/A	N/A	N/A
Sugarbeet	0.125-0.285	2.5	<2.5	N/A	≥2.5	N/A	>2.5	N/A	N/A	N/A
Cucumber	0.315-0.546	<2.5	<2.5	N/A	>2.5	N/A	>2.5	N/A	N/A	N/A
Sunflower	0.239-0.325	2.5	>2.5	N/A	>2.5	N/A	>2.5	N/A	N/A	N/A
Soybean	0.237-0.312	2.5	>2.5	N/A	>2.5	N/A	>2.5	N/A	N/A	N/A
Oilseed rape	0.225-0.339	2.5	>2.5	N/A	>2.5	N/A	>2.5	N/A	N/A	N/A

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Monocot and Dicot

EC₅₀/IC₅₀: >1.44 lbs Propamocarb/A 95% C.I.: N/A
EC₂₅/IC₂₅: >1.44 lbs Propamocarb /A 95% C.I.: N/A
NOAEC: <1.44 lbs Propamocarb/A

D. STUDY DEFICIENCIES:

Shoot length was not measured in this study. High variability among replicates limits the power of the study. The study was not conducted under FIFRA GLP or an equivalent quality assurance, and no description of how the study deviated from GLP was provided. These deficiencies affect the classification of the study

E. REVIEWER COMMENTS:

No monocot or dicot sprayed with the Propamocarb formulation exhibited statistically significant sensitivity ($\geq 25\%$), relative to control plants. However, the reviewer's results indicated that corn and cucumber dry weight were significantly reduced ($p < 0.05$) in the treatment group (21%, corn and 22%, cucumber), relative to the control group. No endpoint was triggered to indicate that a Tier II test should be conducted with any species.

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

F. CONCLUSIONS:

This study is classified as '**unacceptable**' based on its failure to address GLP satisfactorily. Should the registrant provide a detailed delineation and description of how the study deviated from GLP, this study could be upgraded to 'supplemental', as it contains some information that could be used in a risk assessment. However, due to the effects seen at the limit dose, this study is not useful for the purposes of an endangered species assessment. High variability among replications for many species in this study limits the ability to detect statistically significant differences (i.e. the power of the study). Additionally, the failure of the study to evaluate potential effects to plant height limits the utility of this study.

III. REFERENCES:

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

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

Chemikaliengesetz der Bundesrepublik Deutschland (ChemG), Anhang 1, in der Fassung der Bekanntmachung vom 20.06.2002 (BGBl. I S. 2090).

DIN 18123 (April 1983) Baugrunduntersuchung von Bodenproben. Bestimmung der Korngrößenverteilung.

DIN 19682-2 (Marz 1973) Bodenuntersuchungsverfahren im landwirtschaftlichen Wasserbau, Felduntersuchungen. Ermittlung der Bodenart.

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

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Table 6a: Effect of Propamocarb-fosetyl SL 840 on Seedling Emergence.

Species	Results summary for survival (lbs formulation/A)									
	%	NOAEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	slope	Std err
Corn	100	2.5	>2.5	N/A	>2.5	N/A	>2.5	N/A	N/A	N/A
Oat	100	2.5	>2.5	N/A	>2.5	N/A	>2.5	N/A	N/A	N/A
Shattercane	100	2.5	>2.5	N/A	>2.5	N/A	>2.5	N/A	N/A	N/A
Sugarbeet	100	2.5	>2.5	N/A	>2.5	N/A	>2.5	N/A	N/A	N/A
Cucumber	100	2.5	>2.5	N/A	>2.5	N/A	>2.5	N/A	N/A	N/A
Sunflower	100	2.5	>2.5	N/A	>2.5	N/A	>2.5	N/A	N/A	N/A
Soybean	100	2.5	>2.5	N/A	>2.5	N/A	>2.5	N/A	N/A	N/A
Oilseed rape	100	2.5	>2.5	N/A	>2.5	N/A	>2.5	N/A	N/A	N/A

Mid-study emergence								
Control	Corn	Oat	Shattercane	Sugarbeet	Cucumber	Sunflower	Soybean	Oilseed rape
70-100	100	95	70	90	70	80	95	95

Plant Injury Index*								
Control	Corn	Oat	Shattercane	Sugarbeet	Cucumber	Sunflower	Soybean	Oilseed rape
0	0	0	0	0	0	0	0	0

*The index was not described.

Formulation

Monocot and Dicot

EC₅₀/IC₅₀: >2.5 lbs formulation/A 95% C.I.: N/A
 EC₂₅/IC₂₅: >2.5 lbs formulation/A 95% C.I.: N/A
 NOAEC: <2.5 lbs formulation/A
 Slope: N/A Std err: N/A
 Most sensitive: corn and cucumber
 Most sensitive parameter: dry weight

Fosetyl-AL

Monocot and Dicot

EC₅₀/IC₅₀: >0.75 lbs Fosetyl-AL/A 95% C.I.: N/A
 EC₂₅/IC₂₅: >0.75 lbs Fosetyl-AL/A 95% C.I.: N/A
 NOAEC: <0.75 lbs Fosetyl-AL/A

Propamocarb-hydrochloride

Data Evaluation Report on the Acute Toxicity of Propamocarb-fosetyl SL 840 to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}

EPA MRID Number 47370502

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.

Data Evaluation Report on the Acute Toxicity of Propamocarb-fosetylalte SL 840 to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}

EPA MRID Number 47370502

APPENDIX I. OUTPUT OF REVIEWER'S STATISTICAL VERIFICATION:

Corn	Neg Control	2.5 lbs formulation/A	t-test p-value
	0.565	0.54	0.049594426
	0.446	0.338	
	0.647	0.448	
	0.581	0.454	
Average	0.560	0.445	
Variance	0.00701025	0.006854667	
Oat	Neg Control	2.5 lbs formulation/A	t-test p-value
	0.105	0.106	0.119014146
	0.104	0.094	
	0.119	0.062	
	0.102	0.106	
Average	0.1075	0.092	
Variance	6.03333E-05	0.000432	
Shattercane	Neg Control	2.5 lbs formulation/A	t-test p-value
	0.058	0.166	0.147610388
	0.170	0.103	
	0.182	0.071	
	0.199	0.092	
Average	0.15225	0.108	
Variance	0.004089583	0.001671333	
Sugarbeet	Neg Control	2.5 lbs formulation/A	t-test p-value
	0.189	0.168	0.095082196
	0.285	0.15	
	0.215	0.125	
	0.135	0.170	
Average	0.206	0.15325	
Variance	0.003884	0.000435583	
Cucumber	Neg Control	2.5 lbs formulation/A	t-test p-value
	0.546	0.489	0.025647828
	0.496	0.315	
	0.529	0.423	
	0.467	0.369	
Average	0.5095	0.399	
Variance	0.001233667	0.005544	
Oilseed rape	Neg Control	2.5 lbs formulation/A	t-test p-value

Data Evaluation Report on the Acute Toxicity of Propamocarb-fosetylate SL 840 to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}		EPA MRID Number 47370502	
	0.258	0.311	0.065914901
	0.244	0.225	
	0.187	0.262	
	0.234	0.339	
Average	0.23075	0.28425	
Variance	0.000947583	0.002572917	