DATA EVALUATION RECORD
VEGETATIVE VIGOR EC_{25} TEST
§122-1 (TIER I) and 123-1 (TIER II)

1. **CHEMICAL**: Thidiazuron — PC Code No.: 120301

2. **TEST MATERIAL**: Thidiazuron SC42 (Thidiazuron SC 500 g/L) — Purity: 42.6%

3. **CITATION**:

Author:	Teixeira, D.
Title:	Thidiazuron SC42-Determination of Effects on Vegetative Vigor of Ten Plant Species
Study Completion Date:	April 14, 2003
Laboratory:	Springborn Smithers Laboratories 790 Main Street Wareham, Massachusetts 02571-1075
Sponsor:	Bayer CropScience 2 T.W. Alexander Drive Research Triangle Park, North Carolina 27709
Laboratory Report ID:	13798.6114
MRID No.:	45921501
DP Barcode:	D291684

4. **REVIEWED BY**: Rebecca Bryan, Staff Scientist, Dynamac Corporation

Signature: Rebecca Bryan **Date:** 12/4/03

APPROVED BY: Teri Myers, Ph.D., Staff Scientist, Dynamac Corporation

Signature: Teri S. Myers **Date:** 12/4/03

5. **APPROVED BY**: Bill Evans

Signature: **Date:**

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APPROVED BY: Teri Myers, Ph.D., Staff Scientist, Dynamac Corporation

Signature: **Date:** 12/4/03

5. **APPROVED BY:** William Evans, Biologist, OPP/EFED/ERB-1

Signature: William Evans **Date:** 12/2/04

6. STUDY PARAMETERS:

Scientific Name of Test Organism: Dicots: *Brassica oleracea, Cucumis sativus, Lactuca sativa, Glycine max, Lycopersicon esculentum, Brassica rapa*
Monocots: *Zea mays, Avena sativa, Allium cepa, Triticum aestivum*

Definitive Study Duration: 21 days

Type of Concentrations: Measured

7. CONCLUSIONS:

Vegetative vigor was studied on 10 plant species after application of Thidiazuron SC42 at varying concentrations; response in treatment groups was compared to a negative control. Test species included cabbage, corn, cucumber, lettuce, oat, onion, soybean, tomato, turnip, and wheat. Cabbage, corn, oat, onion, turnip, and wheat were tested at a single nominal concentration of 200 g a.i./ha (0.178 lb ai/A)(Tier I test). The Tier II test with soybean and tomato was conducted at concentrations of 12.5, 25, 50, 100, and 200 g a.i./ha (0.0111, 0.0223, 0.0446, 0.0891 and 0.178 lb ai/A). The cucumber Tier II test was conducted at concentrations of 6.3, 12.5, 25, 50, 100, and 200 g a.i./ha (0.0056, 0.0111, 0.0223, 0.0446, 0.0891 and 0.178 lb ai/A). The lettuce Tier II test was conducted at concentrations of 0.20, 0.38, 0.75, 1.5, and 3.0 g a.i./ha (0.0002, 0.0003, 0.0007, 0.0013, and 0.0027 lb ai/A).

During the study, there was no sensitivity (defined by a reduction equal or greater to 25% from control) of shoot length or dry weight of cabbage, corn, oat, onion, soybean, turnip, and wheat; furthermore, there was no sensitivity of lettuce shoot length and tomato dry weight. There were significant effects (≥25%) on the shoot lengths of cucumber and tomato, as well as on the dry weights of cucumber and lettuce. No monocot showed sensitivity to treatment, while lettuce was the most sensitive dicot, based on dry weight; the EC_{25} value for lettuce dry weight was 1.2 g a.i./ha (0.0011 lb ai/A) (the NOEC and EC_{05} were 0.2 and 0.056 g a.i./ha (0.0002 and 0.00005 lb ai/A).

This study is classified as Core. This study is scientifically sound and fulfills the guideline requirements for a vegetative vigor study (Subdivision J, §122-1 (TIER I) and 123-1 (TIER II)).

Most sensitive monocot: None
Most sensitive parameter: N/A
NOEC: 200 g a.i./ha (0.178 lb ai/A)
EC_{05}: >200 g a.i./ha (>0.178 lb ai/A) 95% C.I.: N/A

EC_{25}: >200 g a.i./ha (>0.178 lb ai/A) 95% C.I.: N/A
Slope: N/A

Most sensitive dicot: Lettuce
Most sensitive parameter: Shoot dry weight
NOEC: 0.2 g a.i./ha (0.0002 lb ai/A)
EC_{05}: 0.056 g a.i./ha (0.00005 lb ai/A) 95% C.I.: 0.0012-2.5 g a.i./ha (0.0000001-0.00223 lb ai/A)
EC_{25}: 1.2 g a.i./ha (0.001 lb ai/A) 95% C.I.: 0.3-5.2 g a.i./ha (0.00027-0.0046 lb ai/A)
Slope: 0.718±0.335

8. ADEQUACY OF THE STUDY:

A. Classification: Core

B. Rationale: This study is scientifically sound and fulfills the guideline requirements for a vegetative vigor study (Subdivision J, §122-1 (TIER I) and 123-1 (TIER II)).

C. Repairability: Not applicable

9. GUIDELINE DEVIATIONS:

None

10. SUBMISSION PURPOSE: This study was submitted to provide data on the phytotoxic effects of post-emergent application of Thidiazuron SC42 to non-target crop species for the purpose of chemical registration.

11. MATERIALS AND METHODS:

A. Test Organisms

Guideline Criteria	Reported Information
Species: 6 dicots in 4 families, including soybean and a rootcrop; 4 monocots in 2 families, including corn.	Dicots: cabbage, cucumber, lettuce, soybean, tomato, and turnip Monocots: corn, oat, onion, and wheat

Number of plants per repetition:	Oat, onion, and wheat: 5 plants per replicate, 8 replicates per treatment (40 plants per treatment) Cabbage, corn, cucumber, lettuce, soybean, tomato and turnip: 4 plants per replicate, 10 replicates per treatment (40 plants per treatment)
Source of seed and historical % germination of seed:	See Table 1, p. 32 for seed source information and seed % germination (85-99%).

B. Test System

Guideline Criteria	Reported Information
Solvent:	N/A
Site of test:	The tests were performed in a laboratory greenhouse.
Planting method/type of pot:	Polypropylene pots (13 cm tall with 13 cm top diameter and 9 cm bottom diameter). Filter paper (20 cm diameter) placed in pot interior base. Seeds were planted at a depth of approximately 1 cm in circular pattern in each pot. The support medium was a loamy-sand soil (85% sand, 12% silt, 3% clay, 1.1% organic carbon, and 1.9% organic matter).
Method of application:	The application chamber had an overhead atomizing spray nozzle with a revolving belt that transported the pots past the spray nozzle.
Method of watering:	Sub-irrigation with nutrient solution twice weekly and well water for additional watering (p. 18).
Growth stage at application:	Plants with foliage (2.0-3.0 true leaves, Appendix V, p.157).

C. Test Design

Guideline Criteria	Reported Information
Dose range: 2x or 3x	N/A (only one dose for cabbage, corn, oat, onion, turnip, and wheat) Cucumber, lettuce, soybean, and tomato: 2x
Doses: At least 5	200 g a.i./ha (0.178 lb ai/A)(for cabbage, corn, oat, onion, turnip, and wheat) Lettuce: 0.20, 0.38, 0.75, 1.5, and 3.0 g a.i./ha (0.0002, 0.0003, 0.0007, 0.0013, and 0.0027 lb ai/A). Cucumber: 6.3, 12.5, 25, 50, 100, and 200 g a.i./ha (0.0056, 0.0111, 0.0223, 0.0446, 0.0891 and 0.178 lb ai/A) Soybean and Tomato: 12.5, 25, 50, 100, and 200 g a.i./ha (0.0111, 0.0223, 0.0446, 0.0891 and 0.178 lb ai/A)
Controls: Negative and solvent	Negative control (deionized water)
Replicates per dose: At least 3	Oat, onion, and wheat: 8 replicates per treatment Cabbage, corn, cucumber, lettuce, soybean, tomato, and turnip:10 replicates per treatment
Test duration: 14 days	21 days
Were observations made at least weekly?	Yes
Maximum dosage rate:	Not reported

12. REPORTED RESULTS:

Guideline Criteria	Reported Information
Quality assurance and GLP compliance statements were included in the report?	Yes
Was a NOEC observed for each species?	Yes
Phytotoxic observations:	The morphological abnormalities (including necrosis and chlorosis) were determined on a scale of 0 for a normal plant to 100 for a total plant effect.
Were initial chemical concentrations measured? (Optional)	Yes
Were adequate raw data included?	Replicate data were provided.

Results for the most sensitive parameter of each species

Results Synopsis

Crop	Shoot length*		Dry weight*		Most sensitive parameter
	NOEC	EC_{25}	NOEC	EC_{25}	
Cabbage	0.178	>0.178	0.178	>0.178	None
Corn	0.178	>0.178	0.178	>0.178	None
Cucumber	0.111	0.015	0.111	0.013	Dry weight
Lettuce	0.0027	>0.0027	0.0013	0.0014	Dry weight
Oat	0.178	>0.178	0.178	>0.178	None
Onion	0.178	>0.178	0.178	>0.178	None
Soybean	0.178	>0.178	0.178	>0.178	None
Tomato	0.178	>0.178	0.178	>0.178	None
Turnip	0.178	>0.178	0.178	>0.178	None
Wheat	0.178	>0.178	0.178	>0.178	None

* Units are lb ai/A

Morphological Observations

Cabbage: By 21 days, mean shoot lengths were 4.2 and 3.8 cm in the control and 200 g

a.i./ha (0.178 lb ai/A) treatment group, respectively, which corresponds to 9% inhibition. Mean shoot dry weights were 0.265 and 0.243 g in the control and 200 g a.i./ha (0.178 lb ai/A) treatment group, respectively, which corresponds to 8% inhibition. By 21 days, there were no mortalities or morphological abnormalities.

Corn: By 21 days, mean shoot lengths were 44.1 and 42.9 cm in the control and 200 g a.i./ha (0.178 lb ai/A) treatment group, respectively, which corresponds to 3% inhibition. Mean shoot dry weights were 0.482 and 0.447 g in the control and 200 g a.i./ha (0.178 lb ai/A) treatment group, respectively, which corresponds to 7% inhibition. By 21 days, there were no mortalities or morphological abnormalities.

Cucumber: By 21 days, the shoot length inhibitions were 5, 19, 38, 59, 90, and 100% in the 6.3, 12.5, 25, 50, 100, and 200 g a.i./ha (0.0056, 0.0111, 0.0223, 0.0446, 0.0891 and 0.178 lb ai/A) treatment groups, respectively, compared to the control. The shoot dry weight inhibitions were 5, 21, 41, 54, 89, and 100% in the 6.3, 12.5, 25, 50, 100, and 200 g a.i./ha (0.0056, 0.0111, 0.0223, 0.0446, 0.0891 and 0.178 lb ai/A) treatment groups, respectively, compared to the control. The shoot lengths and dry weights were significantly different in the 25, 50, 100, and 200 g a.i./ha (0.0223, 0.0446, 0.0891 and 0.178 lb ai/A) treatment groups compared to the control.

By 21 days, there was 24, 42, 57, 75, 96, and 100% plant effect in the 6.3, 12.5, 25, 50, 100, and 200 g a.i./ha (0.0056, 0.0111, 0.0223, 0.0446, 0.0891 and 0.178 lb ai/A) treatment groups, respectively. The plant effects included necrosis and mortalities.

Lettuce: By 21 days, the shoot length inhibitions were -10, -9, -8, -6, and -1%, in the 0.20, 0.38, 0.75, 1.5, and 3.0 g a.i./ha (0.0002, 0.0003, 0.0007, 0.0013, and 0.0027 lb ai/A) treatment groups, respectively, compared to the control. The shoot dry weight inhibitions were 12, 27, 12, 22, and 40% in the 0.20, 0.38, 0.75, 1.5, and 3.0 g a.i./ha (0.0002, 0.0003, 0.0007, 0.0013, and 0.0027 lb ai/A) treatment groups, respectively, compared to the control. The dry weights were significantly different in the 3.0 g a.i./ha (0.0027 lb ai/A) treatment group compared to the control.

By 21 days, there was 3, 10, 10, 10, 20, and 30% plant effect in the control, 0.20, 0.38, 0.75, 1.5, and 3.0 g a.i./ha (0.0002, 0.0003, 0.0007, 0.0013, and 0.0027 lb ai/A) treatment groups, respectively. The plant effects included necrosis, chlorosis, and one mortality in the control.

Oat: By 21 days, mean shoot lengths were 32.6 and 29.0 cm in the control and 200 g a.i./ha (0.178 lb ai/A) treatment group, respectively, which corresponds to 11% inhibition. Mean shoot dry weights were 0.256 and 0.288 g in the control and 200 g a.i./ha (0.178 lb ai/A) treatment group, respectively. By 21 days, there were no mortalities or morphological abnormalities.

Onion: By 21 days, mean shoot lengths were 16.6 and 15.1 cm in the control and 200 g a.i./ha (0.178 lb ai/A) treatment group, respectively, which corresponds to 9% inhibition. Mean shoot dry weights were 0.0456 and 0.0459 g in the control and 200 g a.i./ha (0.178 lb ai/A) treatment group, respectively. By 21 days, there were no mortalities or morphological abnormalities.

Soybean: By 21 days, the shoot length inhibitions were 4, 8, 9, 10, and 19% in the 12.5, 25, 50, 100, and 200 g a.i./ha (0.0111, 0.0223, 0.0446, 0.0891 and 0.178 lb ai/A) treatment groups, respectively, compared to the control. The shoot dry weight inhibitions were 2, 12, 12, 12, and 10% in the 12.5, 25, 50, 100, and 200 g a.i./ha 0.0111, 0.0223, 0.0446, 0.0891 and 0.178 lb ai/A) treatment groups, respectively, compared to the control.

By 21 days, there was 17, 31, and 49% plant effect in the 50, 100, and 200 g a.i./ha (0.0446, 0.0891 and 0.178 lb ai/A) treatment groups, respectively. The plant effects included chlorosis, leaf curl, and lateral shoots.

Tomato: By 21 days, the shoot length inhibitions were -1, 0, 19, 23, and 21% in the 12.5, 25, 50, 100, and 200 g a.i./ha (0.0111, 0.0223, 0.0446, 0.0891 and 0.178 lb ai/A) treatment groups, respectively, compared to the control. The shoot dry weight inhibitions were 3, -3, -1, 9, and 5% in the 12.5, 25, 50, 100, and 200 g a.i./ha (0.0111, 0.0223, 0.0446, 0.0891 and 0.178 lb ai/A) treatment groups, respectively, compared to the control.

By 21 days, there was 10 and 50% plant effect in the 100 and 200 g a.i./ha (0.0891 and 0.178 lb ai/A) treatment groups, respectively. The plant effects included chlorosis, leaf curl, and veinal reddening.

Turnip: By 21 days, mean shoot lengths were 4.1 cm in both the control and 200 g a.i./ha (0.178 lb ai/A) treatment group. Mean shoot dry weights were 0.262 and 0.230 g in the control and 200 g a.i./ha (0.178 lb ai/A) treatment group, respectively, which corresponds to 12% inhibition. By 21 days, there was one plant with chlorosis in the control.

Wheat: By 21 days, mean shoot lengths were 23.3 and 22.1 cm in the control and 200 g a.i./ha (0.178 lb ai/A) treatment group, respectively, which corresponds to 5% inhibition. Mean shoot dry weights were 0.276 and 0.242 g in the control and 200 g a.i./ha (0.178 lb ai/A) treatment group, respectively, which corresponds to 12% inhibition. By 21 days, there was a 10% plant effect (chlorosis) in the 200 g a.i./ha (0.178 lb ai/A) treatment group.

Statistical Results

Statistical Method: The NOEC and EC_{25} values were estimated based on percent reduction data when <25% reduction occurred in the treatment group compared to the control. For data with >25% reductions, the replicate means were tested for normality using the Chi-square test and for homogeneity using the Bartlett's test. The Dunnett's Test was used to determine significant differences from the control data. The EC values and 95% confidence intervals were determined by linear regression of response (percent reduction of parameter as compared to the control) versus the nominal concentration, and were calculated using the computer program Toxstat (Gulley et al. 1996).

Most sensitive monocot: None
Most sensitive parameter: None
EC_{25}: >200 g a.i./ha (0.178 lb ai/A)
NOEC: 200 g a.i./ha (0.178 lb ai/A)

Most sensitive dicot: Lettuce
Most sensitive parameter: Shoot dry weight
EC_{25}: 1.6 g a.i./ha (0.0014 lb ai/A)
NOEC: 1.5 g a.i./ha (0.0013 lb ai/A)

13. REVIEWER'S VERIFICATION OF STATISTICAL RESULTS:

Statistical Method: Shoot length and dry weight data were statistically analyzed for all species which exhibited a reduction from control. For the Tier I tests, the NOEC was determined by comparing the treatment group to the control group using a Student's t-test; the EC_{05} and EC_{25} values were visually estimated. For the Tier II tests, the data were analyzed to determine if they satisfied the assumptions of ANOVA (i.e., normal distribution and variance homogeneity). For data which did not satisfy these assumptions, transformations were attempted and if unsuccessful, the non-parametric Kruskall-Walis test, followed by Dunn's multiple comparison, was used to determine the NOEC. When data satisfied the assumptions of ANOVA, the NOEC was determined using ANOVA, followed by either Dunnett's or William's tests (if necessary). These analyses were conducted using TOXSTAT statistical software. The EC_{05} and EC_{25} values (including 95% confidence intervals and slopes) were determined using the Probit method via Nuthatch statistical software.

Results synopsis

Crop	Shoot length*			Dry weight*			Most sensitive parameter
	NOEL	EC_{05}	EC_{25}	NOEL	EC_{05}	EC_{25}	
Cabbage	<0.178[a]	<0.178	>0.178	0.178	<0.178	>0.178	None
Corn	0.178	>0.178	>0.178	0.078	<0.178	>0.178	None
Cucumber	0.0056[a]	0.0084	0.0187[b]	0.0056[a]	0.0075	0.0178[b]	Dry weight
Lettuce	0.0027	>0.0027	>0.0027	0.000178[a]	0.00005	0.0011[a]	Dry weight
Oat	<0.178[a]	<0.178	>0.178	0.178	>0.178	>0.178	None
Onion	<0.178[a]	<0.178	0.178	0.178	>0.178	>0.178	None
Soybean	0.011[a]	0.0187	0.178	0.0446[a]	0.0024	>0.178	None
Tomato	0.0223[a]	0.0098	0.1426[a]	0.178	ND	>0.178	Shoot length
Turnip	0.178	>0.178	0.178	0.178	>0.178	>0.178	None
Wheat	0.178	0.178	0.178	0.178	>0.178	>0.178	None

*All NOEC and EC_{25} values are reported in lb ai/A.
ND=could not be determined using the Probit method.
[a] The value determined by the reviewer was lower than the value reported by the study authors.
[b] The value determined by the reviewer was higher than the value reported by the study authors.

Species	Shoot length*					Dry weight*				
	EC_{05}	Confidence interval	EC_{25}	Confidence interval	Slope	EC_{05}	Confidence interval	EC_{25}	Confidence interval	Slope
Cabbage	<0.178	N/A	>0.178	N/A	N/A	<0.178	N/A	>0.178	N/A	N/A
Corn	>0.178	N/A	>0.178	N/A	N/A	<0.178	N/A	>0.178	N/A	N/A
Cucumber	0.0084	0.0039-0.0178	21[b]	0.0116-0.0303	0.273	0.0075	0.0029-0.0187	0.0178[b]	0.0098-0.0321	2.52
Lettuce	>0.0027	N/A	>0.0027	N/A	N/A	0.00005	0.000001-0.0022	0.0011[a]	0.0027-0.0046	0.718
Oat	<0.178	N/A	>0.178	N/A	N/A	>0.178	N/A	>0.178	N/A	N/A
Onion	<0.178	N/A	>0.178	N/A	N/A	>0.178	N/A	>0.178	N/A	N/A
Soybean	0.0187	0.0056-0.0615	>0.178	N/A	0.73	0.0024	0.00000098-5.79	>0.178	N/A	0.273
Tomato	0.0098	0.0021-0.0437	0.1426[a]	0.0865-0.2496	0.824	ND	N/A	>0.178	N/A	N/A
Turnip	>0.178	N/A	>0.178	N/A	N/A	<0.178	N/A	>0.178	N/A	N/A
Wheat	0.178	N/A	>0.178	N/A	N/A	<0.178	N/A	>0.178	N/A	N/A

*All NOEC and EC_{25} values are reported in lb ai/A.
ND=could not be determined using the Probit method.
[a] The value determined by the reviewer was lower than the value reported by the study authors.
[b] The value determined by the reviewer was higher than the value reported by the study authors.

Most sensitive monocot: None
Most sensitive parameter: N/A
NOEC: 200 g a.i./ha (0.178 lb ai/A)
EC_{05}: >200 g a.i./ha (>0.178 lb ai/A) 95% C.I.: N/A
EC_{25}: >200 g a.i./ha (>0.178 lb ai/A) 95% C.I.: N/A
Slope: N/A

Most sensitive dicot: Lettuce
Most sensitive parameter: Shoot dry weight
NOEC: 0.2 g a.i./ha (0.000178 lb ai/A)
EC_{05}: 0.056 g a.i./ha (0.00005 lb ai/A) 95% C.I.: 0.0012-2.5 g a.i./ha (0.0000001 - 0.0022 lb ai/A)
EC_{25}: 1.2 g a.i./ha (0.0011 lb ai/A) 95% C.I.: 0.3-5.2 g a.i./ha (0.000267 - 0.0046 lb ai/A)
Slope: 0.718±0.335

14. REVIEWER'S COMMENTS:

The reviewer's conclusions regarding the most sensitive dicot were identical to the study author's; lettuce was the most sensitive dicot, based on dry weight. Some of the reviewer's NOEC and EC values differed from the study author's due to the different methods used to estimate these values. Both the study author and the reviewer concluded that no monocot was sensitive to treatment with Thidiazuron SC42. Because the reviewer's estimates were associated with slopes for determining EC values, they were chosen to be reported in the Conclusions section.

This study was conducted in accordance with OECD and U.S. EPA Good Laboratory Practice Standards (40 CFR, Part 160) with the exception of the routine soil and water screening analyses which were conducted at GeoLabs, Inc., Braintree, Massachusetts. The study included a Quality Assurance statement.

A range finding study (pp. 22-23) was conducted with all ten test species at concentrations of 2.0, 20, and 200 g a.i./ha (0.000178, 0.00178, 0.178 lb ai/A). There were apparent treatment-related reductions in shoot length and dry weights for cucumber, lettuce, soybean, and tomato. Visual damage was observed in the 200 g a.i./ha (0.178 lb ai/A) treatment groups for cucumber, lettuce, soybean, and tomato. The definitive test concentrations were based on these results.

The definitive test was conducted from two different experimental start dates: the tier 1 test with oat, soybean, and tomato (February 14-March 11, 2003), the tier 1 test with cabbage, corn, onion, turnip, and wheat (February 14-March 12, 2003), the tier 2 test with lettuce (February 14-March 13, 2003), and the tier 2 test with cucumber (March 11-April 7, 2003).

The stock solutions were cloudy and white in color (pp 18-19). For the first set of test concentrations, the 50, 100, and 200 g a.i./ha treatment groups had cloudy solutions and the 25 g a.i./ha treatment group was a slightly cloudy solution. For the cucumber test, the 25, 50, 100, and 200 g a.i./ha treatment groups had cloudy white solutions.

The TOC of the deionized water was 0.91-1.2 mg/L (measured in February and March, 2003).

Environmental conditions during testing were reported in Table 2, p. 33. In the greenhouse, the temperature range was 13-30°C, the relative humidity range was 17-71%, and the light intensity was 6000-69,000 lux. While these environmental conditions are variable, they did not differ greatly across species, and did not appear to differentially impact control and treatment groups.

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APPENDIX I. OUTPUT FROM REVIEWER'S STATISTICAL VERIFICATION:

Cabbage length

t-Test: Two-Sample Assuming Equal Variances

	Control	200
Mean	4.16	3.78
Variance	0.064889	0.041778
Observations	10	10
Pooled Variance	0.053333	
Hypothesized Mean Difference	0	
df	18	
t Stat	3.679334	
P(T<=t) one-tail	0.000858	
t Critical one-tail	1.734063	
P(T<=t) two-tail	0.001716	
t Critical two-tail	2.100924	

Cabbage weight

t-Test: Two-Sample Assuming Equal Variances

	Control	200
Mean	0.26499	0.24325
Variance	0.000536	0.001213
Observations	10	10
Pooled Variance	0.000874	
Hypothesized Mean Difference	0	
df	18	
t Stat	1.644184	
P(T<=t) one-tail	0.058745	
t Critical one-tail	1.734063	
P(T<=t) two-tail	0.11749	
t Critical two-tail	2.100924	

Corn length

t-Test: Two-Sample Assuming Equal Variances

	Control	200
Mean	44.12	42.94
Variance	18.63956	17.06044

Observations	10	10
Pooled Variance	17.85	
Hypothesized Mean Difference	0	
df	18	
t Stat	0.624522	
P(T<=t) one-tail	0.27006	
t Critical one-tail	1.734063	
P(T<=t) two-tail	0.540121	
t Critical two-tail	2.100924	

Corn weight

t-Test: Two-Sample Assuming Equal Variances

	Control	*200*
Mean	0.48188	0.44744
Variance	0.007243	0.005983
Observations	10	10
Pooled Variance	0.006613	
Hypothesized Mean Difference	0	
df	18	
t Stat	0.947028	
P(T<=t) one-tail	0.178083	
t Critical one-tail	1.734063	
P(T<=t) two-tail	0.356166	
t Critical two-tail	2.100924	

cucumber length

File: 1501cl Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	200.949	40.190	34.736
Within (Error)	54	62.461	1.157	
Total	59	263.410		

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

cucumber length
File: 1501cl 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	5.770	5.770		

2	6.3	5.470	5.470	0.624	
3	12.5	4.720	4.720	2.183	
4	25	3.590	3.590	4.532	*
5	50	2.390	2.390	7.026	*
6	100	0.550	0.550	10.851	*

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

cucumber length
File: 1501cl 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	10			
2	6.3	10	1.111	19.3	0.300
3	12.5	10	1.111	19.3	1.050
4	25	10	1.111	19.3	2.180
5	50	10	1.111	19.3	3.380
6	100	10	1.111	19.3	5.220

cucumber length
File: 1501cl Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	control	10	5.770	5.770	5.770
2	6.3	10	5.470	5.470	5.470
3	12.5	10	4.720	4.720	4.720
4	25	10	3.590	3.590	3.590
5	50	10	2.390	2.390	2.390
6	100	10	0.550	0.550	0.550

cucumber length
File: 1501cl 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	5.770				
6.3	**5.470**	**0.624**		**1.68**	**k= 1, v=54**

12.5	4.720	2.183	*	1.76	k= 2, v=54
25	3.590	4.532	*	1.79	k= 3, v=54
50	2.390	7.027	*	1.80	k= 4, v=54
100	0.550	10.853	*	1.80	k= 5, v=54

s = 1.075
Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds Lower	95% Bounds Upper	Std.Err.	Lower Bound /Estimate
EC5	**9.4**	**4.4**	**20.**	**0.16**	**0.47**
EC10	13.	6.7	24.	0.14	0.53
EC25	**21.**	**13.**	**34.**	**0.10**	**0.62**
EC50	38.	28.	51.	0.066	0.74

Slope = 2.73 Std.Err. = 0.497

Goodness of fit: p = 0.55 based on DF= 3.0 54.

1501CL : cucumber length

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	10.0	5.77	5.54	0.232	100.	0.00
6.30	10.0	5.47	5.44	0.0264	98.3	1.71
12.5	10.0	4.72	5.01	-0.287	90.4	9.60
25.0	10.0	3.59	3.79	-0.204	68.5	31.5
50.0	10.0	2.39	2.03	0.360	36.7	63.3
100.	10.0	0.550	0.677	-0.127	12.2	87.8

cucumber weight
File: 1501cw Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	0.292	0.058	29.000
Within (Error)	54	0.134	0.002	
Total	59	0.426		

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

cucumber weight
File: 1501cw 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	0.226	0.226		
2	6.3	0.215	0.215	0.592	
3	12.5	0.180	0.180	2.323	*
4	25	0.134	0.134	4.596	*
5	50	0.103	0.103	6.154	*
6	100	0.024	0.024	10.122	*

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

cucumber weight
File: 1501cw 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	10			
2	6.3	10	0.046	20.4	0.012
3	12.5	10	0.046	20.4	0.046
4	25	10	0.046	20.4	0.092
5	50	10	0.046	20.4	0.123
6	100	10	0.046	20.4	0.202

cucumber weight
File: 1501cw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	control	10	0.226	0.226	0.226
2	6.3	10	0.215	0.215	0.215
3	12.5	10	0.180	0.180	0.180
4	25	10	0.134	0.134	0.134
5	50	10	0.103	0.103	0.103
6	100	10	0.024	0.024	0.024

cucumber weight

File: 1501cw 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	0.226				
6.3	**0.215**	**0.531**		**1.68**	**k= 1, v=54**
12.5	0.180	2.086	*	1.76	k= 2, v=54
25	0.134	4.127	*	1.79	k= 3, v=54
50	0.103	5.526	*	1.80	k= 4, v=54
100	0.024	9.089	*	1.80	k= 5, v=54

s = 0.050
Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds Lower	95% Bounds Upper	Std.Err.	Lower Bound /Estimate
EC5	**8.4**	**3.3**	**21.**	**0.20**	**0.40**
EC10	12.	5.3	26.	0.17	0.45
EC25	**20.**	**11.**	**36.**	**0.13**	**0.56**
EC50	38.	26.	55.	0.080	0.69

Slope = 2.52 Std.Err. = 0.532

Goodness of fit: p = 0.36 based on DF= 3.0 54.

1501CW : cucumber weight

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	10.0	0.226	0.217	0.00904	100.	0.00
6.30	10.0	0.215	0.212	0.00265	97.5	2.51
12.5	10.0	0.180	0.193	-0.0128	88.7	11.3
25.0	10.0	0.134	0.147	-0.0122	67.5	32.5
50.0	10.0	0.103	0.0826	0.0207	38.0	62.0
100.	10.0	0.0240	0.0313	-0.00735	14.4	85.6

lettuce weight
File: 1501lw Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	0.0129	0.0026	3.714
Within (Error)	54	0.0355	0.0007	

Total	59	0.0484

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

lettuce weight
File: 1501lw 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	0.115	0.115		
2	**0.2**	**0.101**	**0.101**	**1.194**	
3	0.38	0.085	0.085	2.586	*
4	0.75	0.101	0.101	1.207	
5	1.5	0.090	0.090	2.169	
6	3.0	0.069	0.069	3.922	*

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

lettuce weight
File: 1501lw 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	10			
2	0.2	10	0.027	23.7	0.014
3	0.38	10	0.027	23.7	0.031
4	0.75	10	0.027	23.7	0.014
5	1.5	10	0.027	23.7	0.026
6	3.0	10	0.027	23.7	0.046

lettuce weight
File: 1501lw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	control	10	0.115	0.115	0.115
2	0.2	10	0.101	0.101	0.101

3	0.38	10	0.085	0.085	0.093
4	0.75	10	0.101	0.101	0.093
5	1.5	10	0.090	0.090	0.090
6	3.0	10	0.069	0.069	0.069

lettuce weight
File: 1501lw 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	0.115				
0.2	0.101	1.230		1.68	k= 1, v=54
0.38	0.093	1.953	*	1.76	k= 2, v=54
0.75	0.093	1.953	*	1.79	k= 3, v=54
1.5	0.090	2.233	*	1.80	k= 4, v=54
3.0	0.069	4.039	*	1.80	k= 5, v=54

s = 0.026
Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds Lower	95% Bounds Upper	Std.Err.	Lower Bound /Estimate
EC5	**0.056**	**0.0012**	**2.5**	**0.83**	**0.022**
EC10	0.18	0.011	2.9	0.61	0.061
EC25	**1.2**	**0.30**	**5.2**	**0.31**	**0.24**
EC50	11.	1.8	67.	0.39	0.16

Slope = 0.718 Std.Err. = 0.335

Goodness of fit: p = 0.15 based on DF= 3.0 54.

1501LW : lettuce length

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	10.0	0.115	0.114	0.00152	100.	0.00
0.200	10.0	0.101	0.102	-0.000470	89.3	10.7
0.380	10.0	0.0848	0.0970	-0.0122	85.2	14.8
0.750	10.0	0.101	0.0908	0.0103	79.7	20.3
1.50	10.0	0.0898	0.0833	0.00648	73.1	26.9
3.00	10.0	0.0690	0.0746	-0.00563	65.5	34.5

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

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

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

Oat length

t-Test: Two-Sample Assuming Equal Variances

	Control	*200*
Mean	32.55	28.975
Variance	6.391429	7.610714
Observations	8	8
Pooled Variance	7.001071	
Hypothesized Mean Difference	0	
df	14	
t Stat	2.702239	
P(T<=t) one-tail	**0.008591**	
t Critical one-tail	1.761309	
P(T<=t) two-tail	0.017181	
t Critical two-tail	2.144789	

Onion length

t-Test: Two-Sample Assuming Equal Variances

	Control	*200*
Mean	16.5625	15.075
Variance	1.576964	1.207857
Observations	8	8
Pooled Variance	1.392411	
Hypothesized Mean Difference	0	
df	14	
t Stat	2.521177	
P(T<=t) one-tail	**0.012222**	
t Critical one-tail	1.761309	
P(T<=t) two-tail	0.024445	
t Critical two-tail	2.144789	

soybean length

File: 1501sl Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	118.887	23.777	13.824
Within (Error)	54	92.895	1.720	
Total	59	211.782		

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

soybean length
File: 1501sl 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	23.530	23.530		
2	12.5	22.640	22.640	1.517	
3	25	21.760	21.760	3.018	*
4	50	21.330	21.330	3.751	*
5	100	21.180	21.180	4.007	*
6	200	18.990	18.990	7.741	*

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

soybean length
File: 1501sl 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	10			
2	12.5	10	1.355	5.8	0.890
3	25	10	1.355	5.8	1.770
4	50	10	1.355	5.8	2.200
5	100	10	1.355	5.8	2.350
6	200	10	1.355	5.8	4.540

soybean length
File: 1501sl Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	control	10	23.530	23.530	23.530
2	12.5	10	22.640	22.640	22.640
3	25	10	21.760	21.760	21.760
4	50	10	21.330	21.330	21.330
5	100	10	21.180	21.180	21.180
6	200	10	18.990	18.990	18.990

soybean length
File: 1501sl 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	23.530				
12.5	**22.640**	**1.517**		**1.68**	**k= 1, v=54**
25	21.760	3.018	*	1.76	k= 2, v=54
50	21.330	3.751	*	1.79	k= 3, v=54
100	21.180	4.006	*	1.80	k= 4, v=54
200	18.990	7.740	*	1.80	k= 5, v=54

s = 1.312
Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds Lower	95% Bounds Upper	Std.Err.	Lower Bound /Estimate
EC5	**21.**	**6.3**	**69.**	**0.26**	**0.30**
EC10	66.	31.	1.4E+02	0.16	0.48
EC25	**4.5E+02**	**2.4E+02**	**8.2E+02**	**0.13**	**0.55**
EC50	3.8E+03	8.9E+02	1.6E+04	0.31	0.24

Slope = 0.730 Std.Err. = 0.171

Goodness of fit: p = 0.24 based on DF= 3.0 54.

1501SL : soybean length

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	10.0	23.5	23.4	0.0871	100.	0.00
12.5	10.0	22.6	22.6	0.0255	96.5	3.53
25.0	10.0	21.8	22.1	-0.367	94.4	5.62
50.0	10.0	21.3	21.4	-0.106	91.4	8.56
100.	10.0	21.2	20.5	0.676	87.5	12.5
200.	10.0	19.0	19.3	-0.316	82.4	17.6

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

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

soybean weight

File: 1501sw Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	control	1.492	1.492	446.000
2	12.5	1.461	1.461	418.000
3	25	1.316	1.316	306.000
4	50	1.320	1.320	231.000
5	100	1.310	1.310	189.000
6	200	1.337	1.337	240.000

Calculated H Value = 18.303 Critical H Value Table = 11.070
Since Calc H > Crit H REJECT Ho:All groups are equal.

soybean weight
File: 1501sw Transform: NO TRANSFORMATION

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

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP 0 5	0 3	0 4	0 6	0 2	0 1
5	100	1.310	1.310	\					
3	25	1.316	1.316	.	\				
4	50	1.320	1.320	.	.	\			
6	200	1.337	1.337	.	.	.	\		
2	12.5	1.461	1.461	.	.	.	.	\	
1	**control**	**1.492**	**1.492**	*	.	.	.	.	\

* = significant difference (p=0.05) . = no significant difference
Table q value (0.05,6) = 2.936 SE = 7.810

Estimates of EC%

Parameter	Estimate	95% Bounds Lower	Upper	Std.Err.	Lower Bound /Estimate
EC5	**2.7**	**0.0011**	**6.5E+03**	**1.7**	**0.00042**
EC10	58.	1.3	2.6E+03	0.83	0.022
EC25	**9.6E+03**	**1.9**	**5.0E+07**	**1.9**	**0.00019**
EC50	2.8E+06	0.030	2.6E+14	4.0	1.1E-08

Slope = 0.273 Std.Err. = 0.246

Goodness of fit: p = 0.34 based on DF= 3.0 54.

1501SW : soybean weight

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	10.0	1.49	1.50	-0.00333	100.	0.00
12.5	10.0	1.46	1.39	0.0723	92.8	7.16
25.0	10.0	1.32	1.37	-0.0543	91.6	8.36
50.0	10.0	1.32	1.35	-0.0300	90.3	9.70
100.	10.0	1.31	1.33	-0.0183	88.8	11.2
200.	10.0	1.34	1.30	0.0336	87.2	12.8

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

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

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

tomato length
File: 1501tl Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	197.643	39.529	20.805
Within (Error)	54	102.586	1.900	
Total	59	300.229		

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

tomato length
File: 1501tl 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	17.090	17.090		
2	12.5	17.200	17.200	-0.178	
3	25	17.050	17.050	0.065	
4	50	13.940	13.940	5.110	*
5	100	13.160	13.160	6.375	*
6	200	13.440	13.440	5.921	*

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

tomato length
File: 1501tl 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	10			
2	12.5	10	1.424	8.3	-0.110
3	25	10	1.424	8.3	0.040
4	50	10	1.424	8.3	3.150
5	100	10	1.424	8.3	3.930
6	200	10	1.424	8.3	3.650

tomato length
File: 1501tl Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	control	10	17.090	17.090	17.145
2	12.5	10	17.200	17.200	17.145
3	25	10	17.050	17.050	17.050
4	50	10	13.940	13.940	13.940
5	100	10	13.160	13.160	13.300
6	200	10	13.440	13.440	13.300

tomato length
File: 1501tl 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	17.145				
12.5	17.145	0.089		1.68	k= 1, v=54
25	**17.050**	**0.065**		**1.76**	**k= 2, v=54**
50	13.940	5.110	*	1.79	k= 3, v=54
100	13.300	6.149	*	1.80	k= 4, v=54
200	13.300	6.149	*	1.80	k= 5, v=54

s = 1.378
Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds Lower	95% Bounds Upper	Std.Err.	Lower Bound /Estimate
EC5	**11.**	**2.4**	**49.**	**0.33**	**0.22**
EC10	30.	10.	86.	0.23	0.35
EC25	**1.6E+02**	**97.**	**2.8E+02**	**0.11**	**0.59**
EC50	1.1E+03	4.1E+02	2.8E+03	0.21	0.38

Slope = 0.824 Std.Err. = 0.199

!!!Poor fit: p < 0.001 based on DF= 3.00 54.0

1501TL : tomato length

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	10.0	17.1	17.5	-0.422	100.	0.00
12.5	10.0	17.2	16.5	0.661	94.4	5.55
25.0	10.0	17.1	15.9	1.10	91.1	8.92
50.0	10.0	13.9	15.1	-1.19	86.4	13.6
100.	10.0	13.2	14.0	-0.888	80.2	19.8
200.	10.0	13.4	12.7	0.721	72.6	27.4

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

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

tomato dry weight
File: 1501tw Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	0.006	0.001	0.500
Within (Error)	54	0.099	0.002	
Total	59	0.105		

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

tomato dry weight
File: 1501tw 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	0.238	0.238		
2	12.5	0.231	0.231	0.381	
3	25	0.246	0.246	-0.412	
4	50	0.240	0.240	-0.108	
5	100	0.216	0.216	1.106	
6	200	0.227	0.227	0.544	

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

tomato dry weight
File: 1501tw 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	10			
2	12.5	10	0.046	19.4	0.008
3	25	10	0.046	19.4	-0.008
4	50	10	0.046	19.4	-0.002
5	100	10	0.046	19.4	0.022
6	200	10	0.046	19.4	0.011

tomato dry weight
File: 1501tw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	control	10	0.238	0.238	0.239
2	12.5	10	0.231	0.231	0.239
3	25	10	0.246	0.246	0.239
4	50	10	0.240	0.240	0.239
5	100	10	0.216	0.216	0.222
6	200	10	0.227	0.227	0.222

tomato dry weight
File: 1501tw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

	ISOTONIZED	CALC.	SIG	TABLE	DEGREES OF

IDENTIFICATION	MEAN	WILLIAMS	P=.05	WILLIAMS	FREEDOM
control	0.239				
12.5	0.239	0.036		1.68	k= 1, v=54
25	0.239	0.036		1.76	k= 2, v=54
50	0.239	0.036		1.79	k= 3, v=54
100	0.222	0.860		1.80	k= 4, v=54
200	0.222	0.860		1.80	k= 5, v=54

s = 0.043

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

EC_x

!!!Failure #3: Data not suitable for probit model fit.

Criterion is 3 or more distinct isotone means.

Turnip weight

t-Test: Two-Sample Assuming Equal Variances

	Control	*200*
Mean	0.26214	0.23044
Variance	0.001752	0.002232
Observations	10	10
Pooled Variance	0.001992	
Hypothesized Mean Difference	0	
df	18	
t Stat	1.588164	
P(T<=t) one-tail	0.06483	
t Critical one-tail	1.734063	
P(T<=t) two-tail	0.129659	
t Critical two-tail	2.100924	

Wheat length

t-Test: Two-Sample Assuming Equal Variances

	Control	*200*
Mean	23.3125	22.8875
Variance	0.615536	6.515536
Observations	8	8
Pooled Variance	3.565536	
Hypothesized Mean Difference	0	
df	14	
t Stat	0.450149	
P(T<=t) one-tail	0.329747	
t Critical one-tail	1.761309	
P(T<=t) two-tail	0.659495	
t Critical two-tail	2.144789	

Wheat weight

t-Test: Two-Sample Assuming Equal Variances

	Control	*200*
Mean	0.275738	0.24205
Variance	0.002399	0.006153
Observations	8	8
Pooled Variance	0.004276	
Hypothesized Mean Difference	0	
df	14	
t Stat	1.030315	
P(T<=t) one-tail	0.160167	
t Critical one-tail	1.761309	
P(T<=t) two-tail	0.320334	
t Critical two-tail	2.144789	