

US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD
VEGETATIVE VIGOR EC₂₅ TEST
GUIDELINE 123-1 (TIER II)

1. **CHEMICAL:** Glyphosate, Shaughnessey #:103601
2. **TEST MATERIAL:** N-phosphonomethylglycine, CAS No. 1071-83-6, Lot No. RUD-9202-4776-T (Technical), RUD-9202-3961-A (Analytical Standard), Purity:96.6%, White Powder.
3. **CITATION:** Chetram, R.S., 1994. Tier 2 Vegetative Vigor Nontarget Phytotoxicity Study Using Glyphosate. Pan-Ag Study No. 93235. Conducted by Pan-Agricultural Labs, Inc. Madera, CA. Submitted by Monsanto, St. Louis, MO. EPA MRID No. 430887-01.
4. **REVIEWED BY:**
Michael Davy
Agronomist
Ecological Effects Branch (7507C)
U.S.E.P.A.
Signature: *Michael Davy*
Date: 12/6/94
5. **APPROVED BY:**
Daniel Rieder
Section Head
Ecological Effects Branch (7507C)
U.S.E.P.A.
Signature: *Daniel Rieder*
Date: 12-6-94
6. **CONCLUSION:** This study is scientifically valid and has met all of the guidelines for 123-1 (b) vegetative vigor for non-target plants and is classified as core. The most sensitive monocot is corn with an EC₂₅ value of 0.4341 lb ae/A. The most sensitive dicot is tomato with an EC₂₅ value of 0.1106 lb ae/A.
7. **ADEQUACY OF THE STUDY:** CORE
8. **MAJOR GUIDELINE DEVIATIONS:**

- Failure to measure the dead plants for weight or height.

This did not significantly affect the results of the study. *DR*
12-6-94



9. MATERIALS AND METHODS:**A. Test Organisms:**

Guideline Criteria	Reported Information
Species: 6 dicots in 4 families including soybean and rootcrop; 4 monocots in 2 families including corn	Onion, Tomato, Lettuce, Cabbage, Radish, Ryegrass, Cucumber, Soybean, Corn, Oat
Number of plants/rep: 5	5 plants/rep and 4 reps
Source of Seed:	see p. 61 of author's report

Comments: planted large seeds 2.5 cm and 1.3 cm into sandy loam with perlite. Age of plants on date of application on p. 19 of author's report. Each rep consists of one 4" pot.

B. Test System:

Guideline Criteria	Reported Information
Solvent used:	2 drops of Triton surfactant added per 250 ml deionized test solution and control
Site of test:	greenhouse
Planting Method: species/pot	one species/pot/rep
Method of Application:	jet spray in booth
Watering Method: under foliage	1st 48 hrs hand watered under foliage, then overhead spray
No. Days After Application: 14	21 days
Growth Stage/Application: Past first true leaf stage	third true leaf stage

Comments: N/A

C. Test Design:

Guideline Criteria	Reported Information
Dose range and No.: 2X or 3X	2x
Controls: negative and solvent	one control w/ triton
Parameters Observed/Measured	dry weight, height, phytotoxicity, survival
Maximum Labeled Rate:	4.5 lb ae/A

Comments: N/A

10. REPORTED RESULTS:

Guideline Criteria	Reported Information
NOEC Observed?	Yes
Phytotoxic Observations:	stunting, leaf chlorosis, leaf necrosis, leaf desiccation
Measured Initial Chemical Concentrations? Optional	Yes
Raw data included? (Y/N)	Yes

Author's end point values are in lb ae/A. The parameter bearing the most sensitive EC₂₅ values are listed for each plant species. Values in bold denotes the most sensitive monocot and dicot.

species	Parameter	EC ₂₅	NOEC
corn	dry weight	0.37	0.07 ¹
oat	dry weight	0.38	0.14
ryegrass	dry weight	0.80	0.56 ¹
onion	dry weight	0.85	0.56
soybean	dry weight	0.42	0.28
lettuce	dry weight	0.40	0.28
cucumber	dry weight	0.41	0.14 ¹
radish	dry wt & ht.	0.14	0.035
tomato	dry weight	0.090	0.035
cabbage	dry weight	0.30	0.14

Comments phytotoxic symptoms

Author has included the dead plants in the mean for dry weight and height.

The most sensitive EC₂₅ for monocots is 0.37 lb ae/A (corn) and for dicots is 0.090 lb ae/A (tomato). The NOECs are 0.07 and 0.035 lb ae/A, respectively.

Since NOEC was not achieved on tomato and radish in regular testing, a continuation test was done with lower concentrations.

Plant deaths by day 21:

Number of dead plants out of 20 total (4 reps)

concentrations	0.56	1.1	2.3	4.5
soybean	0	0	0	3
lettuce	0	0	12	19
radish	4	14	20	20
tomato	11	20	20	20
cucumber	0	0	4	15
cabbage	0	0	3	12
oat	0	1	3	4
ryegrass	0	1	5	9
corn	0	5	17	14
onion	0	0	0	0

Statistical Results

Statistical Method: Regression analysis and Dunnett's test.

11. STUDY AUTHORS'S CONCLUSIONS / QUALITY ASSURANCE MEASURES:

Quality assurance measures were taken.

12. REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS:

A. Test Procedure:

The study met all of the guideline criteria under the SEP and Subdivision J except for the following :

-Failure to measure the dead plants for weight or height.

B. Statistical Analysis:

- Most sensitive monocot: corn, Parameter : dry weight
Statistical Method: probit; EC_{25} : 0.4341 lb ae/A
- Most sensitive dicot: tomato, Parameter: dry weight
Statistical Method: probit; EC_{25} : 0.1106 lb ae/A

- C. **Discussion/Results:** This study is scientifically valid and has met all of the guidelines for 123-1 (b) vegetative vigor for non-target plants and is classified as core. The most sensitive monocot is corn with an EC_{25} value of 0.4341 lb ae/A. The most sensitive dicot is tomato with an EC_{25} value of 0.1106 lb ae/A.

The only concern the reviewer has is that in reviewing the raw data for dry weight and height, it is noticed that the dead plants were measured as having zero dry weight and zero height and thereby factored into the means for mean weight or height. The more correct method would be to measure the weight and height of the dead plants and use the measurements as part of the mean for the dose. Since the weight and height have been measured as zero, the EC_{25} value may be more sensitive than it should be. However for risk assessment purposes, the reviewer feels that above values can be useful. If the registrant wants the reviewer to recalculate the EC_{25} values, then data on the measurements of the dead plants must be submitted.

13. **COMPLETION OF ONE-LINER FOR STUDY:** Yes

Table VI. Mean plant height and percent effect of glyphosate on soybean, lettuce, and radish plants 0 and 21 days after treatment.

Crop	Treatment Rate (lb ac/A)	0 Days After Treatment		21 Days After Treatment	
		Plant Height ^x (mm)	Pretreatment Difference ^y	Plant Height (mm)	Percent Effect ^y
Soybean	0.0	112**		565	
	0.070	112	0	564	0
	0.14	112	0	527	-7
	0.28	113	1	549	-3
	0.56	112	0	511	-10
	1.1	111	-1	270*	-52
	2.3	112	0	174*	-69
	4.5	113	1	115*	-80
Lettuce	0.0	45**		147	
	0.070	45	0	160	9
	0.14	45	0	146	-1
	0.28	44	-2	146	-1
	0.56	45	0	136	-7
	1.1	45	0	74*	-50
	2.3	45	0	20*	-86
	4.5	45	0	2*	-99
Radish	0.0	50**		129	
	0.070	51	2	115	-11
	0.14	52	4	109*	-16
	0.28	51	2	76*	-41
	0.56	51	2	41*	-68
	1.1	51	2	14*	-89
	2.3	50	0	0*	-100
	4.5	51	2	0*	-100
	0.0	50**		191**	
	0.0044	49	-2	185	-3
	0.0088	49	-2	191	0
	0.018	51	2	196	3
	0.035	51	2	188	-2
	0.070	49	-2	186	-3

^x The number of observations and the standard deviation of each treatment can be found in the calculation sheets (Appendix C).

^y Pretreatment difference and Percent effect on plant growth = $\frac{(\text{treatment mean} - \text{control mean})}{\text{control mean}} \times 100$

* Indicates significant difference from control at $p < 0.05$.

** Column values do not differ at $p < 0.05$ according to Dunnetts.

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Table VII. Mean plant height and percent effect of glyphosate on tomato, cucumber, cabbage, and oat plants 0 and 21 days after treatment.

Crop	Treatment Rate (lb ac/A)	0 Days After Treatment		21 Days After Treatment	
		Plant Height ^x (mm)	Pretreatment Difference ^y	Plant Height (mm)	Percent Effect ^y
Tomato	0.0	50**		290	
	0.070	51	2	264*	-9
	0.14	52	4	257*	-11
	0.28	52	4	198*	-32
	0.56	52	4	35*	-88
	1.1	50	0	0*	-100
	2.3	50	0	0*	-100
	4.5	52	4	0*	-100
	0.0	67**		469**	
	0.0044	66	-1	493	5
	0.0088	67	0	460	-2
	0.018	67	0	500	7
	0.035	67	0	468	0
	0.070	67	0	478	2
Cucumber	0.0	126**		328	
	0.070	125	-1	336	2
	0.14	127	1	341	4
	0.28	125	-1	290	-12
	0.56	126	0	205*	-38
	1.1	125	-1	185*	-44
	2.3	126	0	113*	-66
	4.5	126	0	29*	-91
Cabbage	0.0	40**		139	
	0.070	40	0	129	-7
	0.14	40	0	132	-5
	0.28	40	0	120	-14
	0.56	40	0	125	-10
	1.1	40	0	67*	-52
	2.3	40	0	36*	-74
	4.5	41	3	12*	-91
Oat	0.0	103**		582	
	0.070	103	0	581	0
	0.14	103	0	548	-6
	0.28	103	0	538	-8
	0.56	103	0	491	-16
	1.1	103	0	317*	-46
	2.3	103	0	133*	-77
	4.5	103	0	103*	-82

^x The number of observations and the standard deviation of each treatment can be found in the calculation sheets (Appendix C).

^y Pretreatment difference and Percent effect on plant growth = $\frac{(\text{treatment mean} - \text{control mean})}{\text{control mean}} \times 100$

* Indicates significant difference from control at $p < 0.05$.

** Column values do not differ at $p < 0.05$ according to Dunnetts.

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Table VIII. Mean plant height and percent effect of glyphosate on ryegrass, corn, and onion plants 0 and 21 days after treatment.

Crop	Treatment Rate (lb ac/A)	0 Days After Treatment		21 Days After Treatment	
		Plant Height ^x (mm)	Pretreatment Difference ^y	Plant Height (mm)	Percent Effect ^y
Ryegrass	0.0	56**		179	
	0.070	57	2	186	4
	0.14	58	4	181	1
	0.28	58	4	188	5
	0.56	58	4	177	-1
	1.1	57	2	139*	-22
	2.3	56	0	58*	-68
	4.5	59	5	36*	-80
Corn	0.0	141**		735	
	0.070	139	-1	718	-2
	0.14	139	-1	705	-4
	0.28	141	0	681	-7
	0.56	141	0	632	-14
	1.1	137	-3	151*	-79
	2.3	136	-4	24*	-97
	4.5	140	-1	61*	-92
Onion	0.0	119**		241	
	0.070	121	2	235	-2
	0.14	121	2	241	0
	0.28	123	3	221	-8
	0.56	123	3	241	0
	1.1	121	2	175*	-27
	2.3	120	1	144*	-40
	4.5	123	3	125*	-48

^x The number of observations and the standard deviation of each treatment can be found in the calculation sheets (Appendix C).

^y Pretreatment difference and Percent effect on plant growth = $\frac{(\text{treatment mean} - \text{control mean})}{\text{control mean}} \times 100$

* Indicates significant difference from control at $p < 0.05$.

** Column values do not differ at $p < 0.05$ according to Dunnetts.

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Table IX. Mean plant dry weight and percent effect of glyphosate on soybean, lettuce, and radish plants 21 days after treatment.

Crop	Treatment Rate (lb ac/A)	Dry Weight ^{x,y} (g/rep)	Percent Effect ^z
Soybean	0.0	8.895	
	0.070	9.260	4
	0.14	8.462	-5
	0.28	8.014	-10
	0.56	6.068*	-32
	1.1	3.044*	-66
	2.3	1.634*	-82
	4.5	0.691*	-92
Lettuce	0.0	3.540	
	0.070	3.972	12
	0.14	3.781	7
	0.28	3.393	-4
	0.56	2.314*	-35
	1.1	0.603*	-83
	2.3	0.107*	-97
	4.5	0.002*	-100
Radish	0.0	2.040	
	0.070	1.535*	-25
	0.14	1.547*	-24
	0.28	0.762*	-63
	0.56	0.313*	-85
	1.1	0.080*	-96
	2.3	0.000*	-100
	4.5	0.000*	-100
	0.0	1.483**	
	0.0044	1.702	15
	0.0088	1.679	13
	0.018	1.581	7
	0.035	1.548	4
	0.070	1.343	-9

^x Plants were cut at the soil level, placed in preweighed aluminum sheets, and dried at 100°C for a minimum of 48 hours.

^y The number of observations and the standard deviation of each treatment mean can be found in the calculation sheets (Appendix C).

^z Percent effect = $\frac{(\text{treatment mean} - \text{control mean})}{\text{control mean}} \times 100$

* Indicates significant reduction from control at $p < 0.05$.

** Column values do not differ at $p < 0.05$ according to Dunnetts.

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Table X. Mean plant dry weight and percent effect of glyphosate on tomato, cucumber, cabbage, and oat plants 21 days after treatment.

Crop	Treatment Rate (lb ac/A)	Dry Weight ^{x,y} (g/rep)	Percent Effect ^z
Tomato <i>EC₅₀ = 0.1755 SLOPE = 3.3609 EC₂₅ = 0.1106</i>	0.0	5.634	
	0.070	4.988*	-11
	0.14	3.524*	-37
	0.28	1.725*	-69
	0.56	0.129*	-98
	1.1	0.000*	-100
	2.3	0.000*	-100
	4.5	0.000*	-100
	0.0	4.667**	
	0.0044	7.203	54
	0.0088	6.184	33
	0.018	6.192	33
	0.035	6.268	34
	0.070	4.911	5
Cucumber <i>EC₅₀ = 0.8583 SLOPE = 2.5809 EC₂₅ = 0.4592</i>	0.0	8.473	
	0.070	8.948	6
	0.14	8.566	1
	0.28	7.567	-11
	0.56	5.191*	-39
	1.1	3.103*	-63
	2.3	1.272*	-85
	4.5	0.317*	-96
Cabbage <i>E</i>	0.0	4.951	
	0.070	4.703	-5
	0.14	4.822	-3
	0.28	3.786*	-24
	0.56	2.834*	-43
	1.1	0.634*	-87
	2.3	0.208*	-96
	4.5	0.083*	-98
Oat <i>EC₅₀ = 0.7742 SLOPE = 2.30879 EC₂₅ = 0.3951</i>	0.0	4.151	
	0.070	4.036	-3
	0.14	4.056	-2
	0.28	3.432*	-17
	0.56	2.965*	-29
	1.1	1.402*	-66
	2.3	0.342*	-92
	4.5	0.247*	-94

^x Plants were cut at the soil level, placed in preweighed aluminum sheets, and dried at 100°C for a minimum of 48 hours.

^y The number of observations and the standard deviation of each treatment mean can be found in the calculation sheets (Appendix C).

^z Percent effect = $\frac{(\text{treatment mean} - \text{control mean})}{\text{control mean}} \times 100$

* Indicates significant reduction from control at $p < 0.05$.

** Column values do not differ at $p < 0.05$ according to Dunnetts.

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Table XI. Mean plant dry weight and percent effect of glyphosate on ryegrass, corn, and onion plants 21 days after treatment.

Crop	Treatment Rate (lb ac/A)	Dry Weight ^{x,y} (g/rep)	Percent Effect ^z
Ryegrass <i>EC₅₀ = 11.34633 SLOPE = 4.90404 EC₂₅ = 0.9808</i>	0.0	0.833	
	0.070	1.159	39
	0.14	1.249	50
	0.28	1.058	27
	0.56	0.859	3
	1.1	0.517*	-38
	2.3	0.074*	-91
	4.5	0.021*	-97
Corn <i>EC₅₀ = 0.661498 SLOPE = 3.68663 EC₂₅ = 0.4341</i>	0.0	7.237	
	0.070	7.394	2
	0.14	7.629	5
	0.28	6.246	-14
	0.56	5.547	-23
	1.1	0.655*	-91
	2.3	0.085*	-99
	4.5	0.175*	-98
Onion <i>EC₅₀ = 1.5824 SLOPE = 2.39852 EC₂₅ = 0.3287</i>	0.0	0.955	
	0.070	0.994	4
	0.14	1.094	15
	0.28	0.857	-10
	0.56	1.063	11
	1.1	0.567*	-41
	2.3	0.274*	-71
	4.5	0.162*	-83

^x Plants were cut at the soil level, placed in preweighed aluminum sheets, and dried at 100°C for a minimum of 48 hours.

^y The number of observations and the standard deviation of each treatment mean can be found in the calculation sheets (Appendix C).

^z Percent effect = $\frac{(\text{treatment mean} - \text{control mean})}{\text{control mean}} \times 100$

* Indicates significant reduction from control at $p < 0.05$.

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Table XII. No-effect concentration (NOEC) (lb ae/A), EC₂₅ and EC₅₀ values (lb ae/A) for parameters measured during a nontarget plant study with glyphosate 21 days after treatment.

Crop	Phytotoxicity	Percent Survival		
	NOEC ^z	NOEC	EC ₂₅	EC ₅₀
Soybean	0.28	4.5	>4.5*	>4.5*
Lettuce	0.28	1.1	1.4	2.5
Radish	0.14	0.28	0.44	0.82
Tomato	0.070	0.28	0.26	0.46
Cucumber	0.14	2.3	2.6	3.6
Cabbage	0.56	1.1	2.9	4.1
Oat	0.56	2.3	4.4	>4.5*
Ryegrass	0.56	1.1	2.3	4.1
Corn	0.070	0.56	0.79	1.5
Onion	0.56	4.5	>4.5*	>4.5*

Crop	Plant Height (mm)			Plant Dry Weight (mg)		
	NOEC	EC ₂₅	EC ₅₀	NOEC	EC ₂₅	EC ₅₀
Soybean	0.56	0.57	1.4	0.28	0.42	0.87
Lettuce	0.56	0.64	1.2	0.28	0.40	0.68
Radish	0.070	0.14	0.32	0.035	0.14	0.22
Tomato	0.035	0.20	0.30	0.035	0.090	0.13
Cucumber	0.28	0.46	1.3	0.28	0.41	0.80
Cabbage	0.56	0.67	1.3	0.14	0.30	0.66
Oat	0.56	0.55	1.2	0.14	0.38	0.78
Ryegrass	0.56	0.96	2.1	0.56	0.80	1.2
Corn	0.56	0.42	0.82	0.56	0.37	0.67
Onion	0.56	1.2	>4.5*	0.56	0.85	1.6

^y EC₂₅ and EC₅₀ values are not normally determined for mean phytotoxicity rating.

^z Highest treatment concentration which was not statistically ($p < 0.05$) different from the control.

* Estimated EC value

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Title Randomized Block Analysis of an 8 Treatment 4 Rep Design with Dunnett's Comparison
Date 25-Aug-93

Treatment (to seed)	Rep	Replicate Values				Mean	Std Dev.	Percent Effect
		Time Wt.(gm)	Total Wt.(gm)	Plant Wt.(gm)	Flux Wt.(gm)			

0.0	1	3.545	13.714	10.169	8.895	1.072	NA
	2	3.767	12.868	8.591			
	3	3.547	12.801	9.234			
	4	3.774	11.428	7.634			
0.070	1	3.535	12.721	9.186	9.250	1.115	4
	2	3.777	12.152	8.375			
	3	3.545	14.298	10.833			
	4	3.774	12.400	8.638			
0.14	1	3.548	12.945	9.397	8.482	1.186	5
	2	3.768	13.177	9.599			
	3	3.539	10.630	7.091			
	4	3.772	11.624	7.852			
0.28	1	3.524	10.249	6.725	6.014	1.006	10
	2	3.778	12.789	9.011			
	3	3.536	11.274	7.748			
	4	3.779	12.352	8.573			
0.56	1	3.529	10.576	7.047	6.066	0.753	32
	2	3.772	9.706	5.954			
	3	3.530	8.747	5.217			
	4	3.761	9.856	6.075			
1.1	1	3.529	6.788	3.239	3.044	0.372	46
	2	3.738	6.328	2.770			
	3	3.531	6.221	2.690			
	4	3.799	7.214	3.455			
2.3	1	3.543	5.182	1.619	1.634	0.306	82
	2	3.766	5.080	1.294			
	3	3.534	5.571	2.037			
	4	3.770	5.356	1.586			
4.5	1	3.534	4.693	1.159	0.691	0.419	92
	2	3.766	4.617	0.851			
	3	3.547	3.719	0.172			
	4	3.759	4.340	0.581			

MSL- 1 3 3 2 0

Pair Ag #: 93235

Analytic of Variance (Plant Dry Weight) F (critical value) = 2.49

Source	df	SS	MS	F-value	Signif
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Total 31 335.97705
Treatments 7 138.61772
Block (rep) 3 1.25425
Error 21 16.10508
Total 31 335.97705

MS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Data entered by DAG
Data printed on 25-Aug-93

Verified by ELC

Vegetative vigor - Plant dry weight (gm)
Compound - Olyphonate
Treatment date - June 16, 1993
Days after treatment - 21
Study Number - 89235
Plant collection date - July 7, 1993
Test system - Soybean

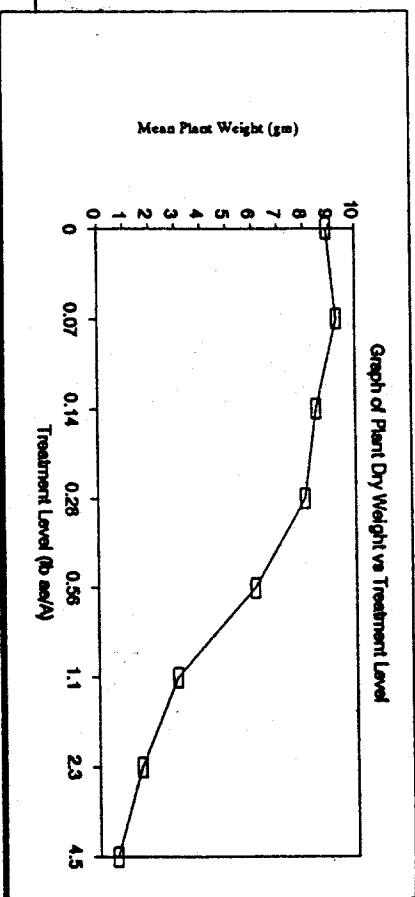
Comments

One-sided Dunnett value - 2.51
NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Dunnett's Procedure

Comparison	Difference	Signif	D (crit 4df)
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Grp 1 vs Grp 2 0.00 NS L35
Grp 1 vs Grp 3 0.43 NS L35
Grp 1 vs Grp 4 0.88 NS L35
Grp 1 vs Grp 5 2.83 S L35
Grp 1 vs Grp 6 3.85 S L35
Grp 1 vs Grp 7 7.26 S L35
Grp 1 vs Grp 8 8.20 S L35



Title: Randomized Block Analysis of an 8 Treatment 4 Rep Design with Dunnett's Comparison
Date: 12 Jul 93

Treatment (lb a.i./A)	Rep	Replicate Values			Mean	Std. Dev.	Percent Effect
		Treat Wt.(gm)	Total Wt.(gm)	Plant Wt.(gm)			

0.0	1	3.572	6.742	3.170	3.540	0.391	NA
	2	3.766	7.096	3.326			
	3	3.566	7.631	4.063			
	4	3.774	7.273	3.599			
0.070	1	3.559	7.029	3.470	3.572	0.509	12
	2	3.785	8.427	4.642			
	3	3.563	7.626	4.063			
	4	3.784	7.486	3.712			
0.14	1	3.573	7.180	3.567	3.781	0.173	7
	2	3.773	7.601	3.826			
	3	3.577	7.571	3.994			
	4	3.775	7.489	3.714			
0.28	1	3.567	7.066	3.469	3.393	0.212	4
	2	3.767	7.406	3.639			
	3	3.570	6.733	3.163			
	4	3.775	7.637	3.282			
0.56	1	3.562	5.896	2.334	2.314	0.114	35
	2	3.777	6.105	2.435			
	3	3.555	5.990	2.435			
	4	3.775	5.934	2.159			
1.1	1	3.539	4.133	0.594	0.603	0.266	43
	2	3.776	4.261	0.683			
	3	3.560	4.537	0.977			
	4	3.774	4.126	0.334			
2.3	1	3.534	3.720	0.196	0.307	0.101	97
	2	3.769	0.000	0.000			
	3	3.534	3.597	0.043			
	4	3.780	3.570	0.190			
4.5	1	0.000	0.000	0.000	0.002	0.004	100
	2	0.000	0.000	0.000			
	3	3.699	3.677	0.006			
	4	0.000	0.000	0.000			

Analysis of Variance (Plant Dry Weight)

Source	df	SS	MS	F-value	Signif.
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Total	31	84.2712			
Treatments	7	82.5628	11.7947	174.43	S
Block(Rep)	3	0.23647	0.07882		
Error	21	1.47187	0.07009		

NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Data entered by: DAG
Date printed on: 12 Jul 93

Verified by: RLC

Vegative vigor - Plant dry weight (gm)

Compound - Oryzate

Treatment date - June 14, 1993

Days after treatment - 21

Study Number - 95235

Plant collection date - July 7, 1993

Test system - Lorraine

Comments

Dunnett's Procedure

Comparison

Difference

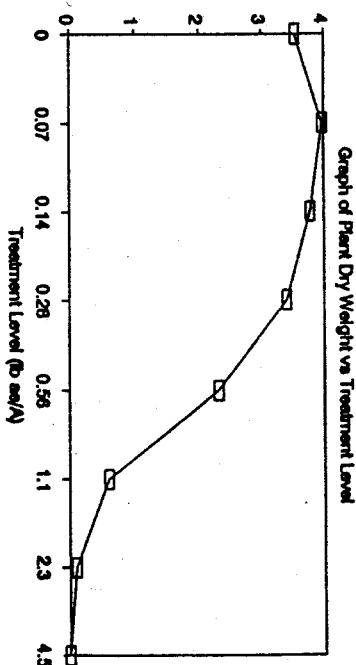
Signif.

D (crit 407)

Grp 1 vs Grp 2	0.00	NS	0.46
Grp 1 vs Grp 3	0.00	NS	0.46
Grp 1 vs Grp 4	0.15	NS	0.46
Grp 1 vs Grp 5	1.23	S	0.46
Grp 1 vs Grp 6	2.94	S	0.46
Grp 1 vs Grp 7	3.43	S	0.46
Grp 1 vs Grp 8	3.54	S	0.46

One-sided Dunnett value - 2.31
NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Mean Plant Weight (gm)



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Title: Randomized Block Analysis of an 8 Treatment 4 Rep Design with Dunnett's Comparison
Date: 12-Jul-93

Treatment (lb aa/A)	Rep	Replicate Values			Mean Plant Wt.(gm)	Std. Dev.	Percent Effect
		Tare Wt.(gm)	Total Wt.(gm)	plant Wt.(gm)			
0.0	1	3.553	5.237	1.684	2.040	0.246	NA
	2	3.784	6.020	2.236			
	3	3.571	5.644	2.073			
	4	3.775	5.940	2.165			
0.070	1	3.548	5.034	1.486	1.535	0.185	-25
	2	3.780	5.264	1.484			
	3	3.552	5.352	1.800			
	4	3.779	5.149	1.370			
0.14	1	3.547	4.720	1.173	1.547	0.276	-24
	2	3.758	5.295	1.537			
	3	3.555	5.205	1.650			
	4	3.773	5.599	1.826			
0.28	1	3.554	4.753	1.199	0.762	0.295	-63
	2	3.784	4.379	0.595			
	3	3.551	4.229	0.678			
	4	3.777	4.352	0.575			
0.56	1	3.552	3.934	0.382	0.313	0.067	-85
	2	3.781	4.129	0.348			
	3	3.551	3.847	0.296			
	4	3.780	4.008	0.228			
1.1	1	3.547	3.638	0.091	0.080	0.067	-96
	2	3.779	3.805	0.026			
	3	3.540	3.710	0.170			
	4	3.776	3.809	0.033			
2.3	1	3.532	0.000	0.000	0.000	0.000	-100
	2	3.789	0.000	0.000			
	3	3.535	0.000	0.000			
	4	3.792	0.000	0.000			
4.5	1	0.000	0.000	0.000	0.000	0.000	-100
	2	0.000	0.000	0.000			
	3	0.000	0.000	0.000			
	4	0.000	0.000	0.000			

Vegetative vigor - Plant dry weight (gm)

Compound - Glyphosate

Treatment date - June 16, 1993

Days after treatment - 21

Study Number - 93235

Plant collection date - July 7, 1993

Test system - Radish

Comments:

One-sided Dunnett value - 2.51
NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Dunnett's Procedure

Comparison	Difference	Signif	D (crit diff)
Grp 1 vs Grp 2	0.51	S	0.34
Grp 1 vs Grp 3	0.49	S	0.34
Grp 1 vs Grp 4	1.28	S	0.34
Grp 1 vs Grp 5	1.73	S	0.34
Grp 1 vs Grp 6	1.96	S	0.34
Grp 1 vs Grp 7	2.04	S	0.34
Grp 1 vs Grp 8	2.04	S	0.34

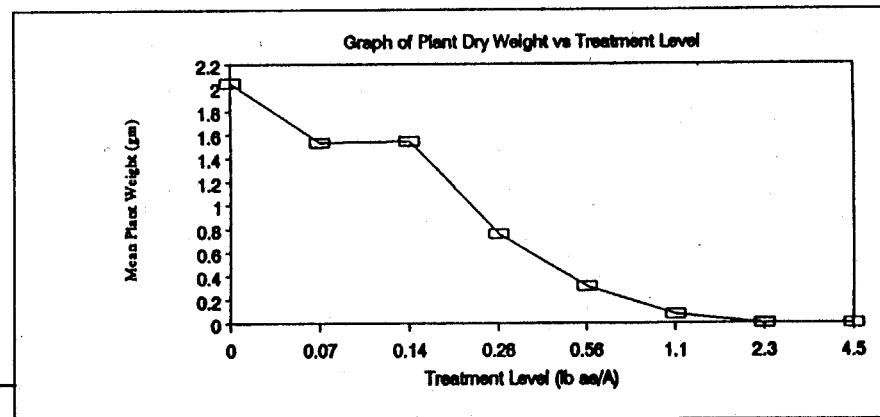
Analysis of Variance (Plant Dry Weight)					F (critical value) =	2.49
Source	df	SS	MS	F value	Signif	
Total	31	19.47438				
Treatments	7	18.67391	2.66770	72.59	S	
Blocks (reps)	3	0.02672	0.00957			
Error	21	0.77175	0.03675			

NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Date entered by JAG

Date printed on 12-Jul-93

Verified by RSL



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Title: Randomized Block Analysis of a 6 Treatment 4 Rep Design with Dunnett's Comparison
Date: 07-Sep-93

Treatment (lb a/A)	Rep	Replicate Values			Mean plant wt.(gm)	Std. Dev.	Percent Effect
		Tare Wt.(gm)	Total Wt.(gm)	Plant Wt.(gm)			
0.0	1	3.670	5.213	1.543	1.483	0.149	NA
	2	3.663	4.962	1.299			
	3	3.670	5.113	1.443			
	4	3.683	5.331	1.648			
0.0044	1	3.660	5.583	1.923	1.702	0.350	15
	2	3.691	4.875	1.184			
	3	3.652	5.561	1.909			
	4	3.685	5.478	1.793			
0.0088	1	3.667	5.668	2.001	1.679	0.245	13
	2	3.671	5.345	1.674			
	3	3.667	5.073	1.406			
	4	3.684	5.318	1.634			
0.018	1	3.683	5.044	1.361	1.581	0.183	7
	2	3.691	5.498	1.807			
	3	3.686	5.288	1.602			
	4	3.680	5.233	1.553			
0.035	1	3.676	5.270	1.594	1.548	0.169	4
	2	3.680	5.025	1.345			
	3	3.678	5.181	1.503			
	4	3.681	5.429	1.748			
0.070	1	3.681	4.809	1.128	1.343	0.167	-9
	2	3.684	5.118	1.434			
	3	3.695	4.997	1.302			
	4	3.666	5.174	1.508			

Analysis of Variance (Plant Dry Weight) F (critical value) = 2.90

Source	df	SS	MS	F value	Signif
Total	23	1.23551			
Treatments	5	0.35121	0.07024	1.38	NS
Blocks(reps)	3	0.12116	0.04039		
Error	15	0.76314	0.05088		

One-sided Dunnett value = 2.44
NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Data entered by KMR

Data verified by RSC

Data printed on 07-Sep-93

Vegetative vigor - plant dry weight (gm)

Compound - Glyphosate

Study Number - 93235 (cont.)

Treatment date - August 11, 1993

Plant collection date - September 1, 1993

Days after treatment - 21

Test system - Radish

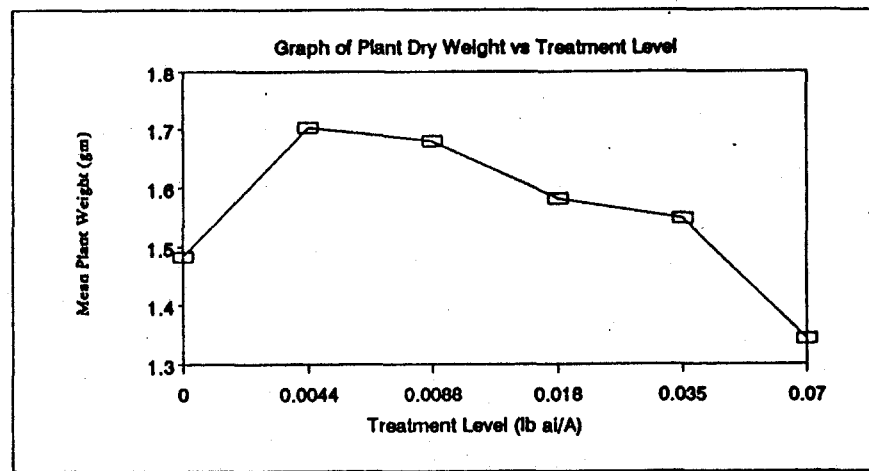
Comments:

Dunnett's Procedure

Comparison	Difference	Signif	D (crit diff)
Grp 1 vs Grp 2	0.00	NS	0.39
Grp 1 vs Grp 3	0.00	NS	0.39
Grp 1 vs Grp 4	0.00	NS	0.39
Grp 1 vs Grp 5	0.00	NS	0.39
Grp 1 vs Grp 6	0.14	NS	0.39

NS - Not significant at alpha 0.05

S - Significant at alpha 0.05



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Title Randomized Block Analysis of an 8 Treatment 4 Rep Design with Dunnett's Comparison
Date 12-Jul-93

Vegetable type - Plant dry weight (gm)
Compound - Glyphosate
Treatment date - June 16, 1993
Days after treatment - 21
Study Number - 93235
Plant collection date - July 7, 1993
Test system - Tomato

Comments:
One or more treatment level standard deviations equal to 0 - possible nonnormality!

One-sided Dunnett value - 2.51
NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Comparison	Difference	Signif	D (est df)
Dunnett's Procedure			
Comp 1 vs Comp 2	0.65	S	0.62
Comp 1 vs Comp 3	2.11	S	0.62
Comp 1 vs Comp 4	3.91	S	0.62
Comp 1 vs Comp 5	3.51	S	0.62
Comp 1 vs Comp 6	3.63	S	0.62
Comp 1 vs Comp 7	3.63	S	0.62
Comp 1 vs Comp 8	3.63	S	0.62

Treatment (Seed/A)	Rep	Replicate Values			Mean Plant Wt (gm)	Std. Dev.	Percent Effect
		Treat Wt (gm)	Total Wt (gm)	Plant Wt (gm)			
0.0	1	3.572	9.740	6.166	5.634	0.671	NA
	2	3.600	8.528	4.728			
	3	3.590	9.103	5.523			
	4	3.811	9.927	6.116			
0.070	1	3.581	8.689	5.108	4.988	0.391	-11
	2	3.809	9.185	5.376			
	3	3.570	8.592	5.022			
	4	3.786	8.233	4.447			
0.14	1	3.565	7.002	3.437	3.524	0.467	-37
	2	3.783	6.987	3.202			
	3	3.571	7.807	4.236			
	4	3.784	7.004	3.220			
0.28	1	3.579	5.027	1.448	1.725	0.302	-49
	2	3.769	5.635	1.886			
	3	3.560	5.628	2.068			
	4	3.763	5.259	1.496			
0.56	1	3.574	3.675	0.101	0.129	0.045	-98
	2	3.778	3.877	0.099			
	3	3.564	3.779	0.195			
	4	3.784	3.985	0.121			
1.1	1	3.568	0.000	0.000	0.000	0.000	-100
	2	3.787	0.000	0.000			
	3	3.559	0.000	0.000			
	4	3.784	0.000	0.000			
2.3	1	0.000	0.000	0.000	0.000	0.000	-100
	2	0.000	0.000	0.000			
	3	0.000	0.000	0.000			
	4	0.000	0.000	0.000			
4.5	1	0.000	0.000	0.000	0.000	0.000	-100
	2	0.000	0.000	0.000			
	3	0.000	0.000	0.000			
	4	0.000	0.000	0.000			

MSL 1 3 3 2 0

Part-Ag #: 93235

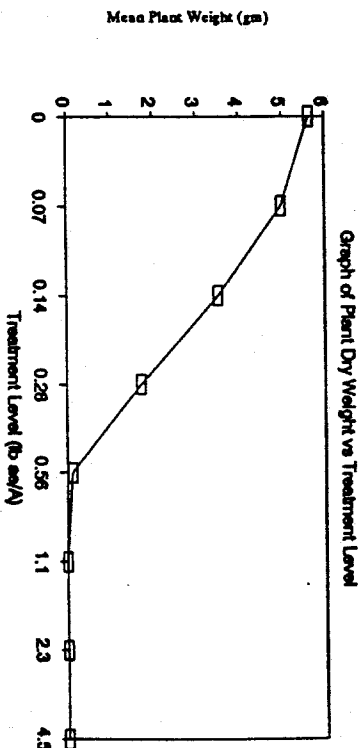
Analysis of Variance (Plant Dry Weight)
Source D SS MS F-value Signif

Total 31 162.92740
Treatments 7 160.12853
Block (rep) 3 0.25366
Error 21 2.54622
0.12125

NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Data entered by DAG
Data printed on 12-Jul-93

Verified by RSL



Title: Randomized Block Analysis of a 6 Treatment 4 Rep Design with Dunnett's Comparison
Date: 07-Sep-93

Treatment (lb a/A)	Rep	Replicate Values			Mean plant wt.(gm)	Std. Dev.	Percent Effect
		Tare Wt.(gm)	Total Wt.(gm)	Plant Wt.(gm)			
0.0	1	3.642	7.666	4.024	4.667	0.757	NA
	2	3.660	8.593	4.933			
	3	3.661	9.278	5.617			
	4	3.656	7.748	4.092			
0.0044	1	3.658	8.389	4.731	7.203	1.680	54
	2	3.673	11.395	7.722			
	3	3.659	12.142	8.483			
	4	3.673	11.548	7.875			
0.0088	1	3.672	10.107	6.435	6.184	1.144	33
	2	3.666	8.259	4.593			
	3	3.678	10.067	6.389			
	4	3.683	11.003	7.320			
0.018	1	3.675	10.264	6.589	6.192	0.738	33
	2	3.683	8.795	5.112			
	3	3.682	10.413	6.731			
	4	3.683	10.018	6.335			
0.035	1	3.703	9.763	6.060	6.268	1.285	34
	2	3.663	8.200	4.537			
	3	3.693	10.794	7.101			
	4	3.652	11.025	7.373			
0.070	1	3.676	8.784	5.108	4.911	0.674	5
	2	3.670	7.597	3.927			
	3	3.661	9.115	5.454			
	4	3.683	8.839	5.156			

Analysis of Variance (Plant Dry Weight)

F (critical value) = 2.90

Source	df	SS	MS	F value	Signif
Total	23	40.05517			
Treatments	5	17.98946	3.59789	4.11	S
Blocks(reps)	3	8.94388	2.98129		
Error	15	13.12184	0.87479		

One-sided Dunnett value - 2.44
NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Data entered by KMR

Data verified by ESL

Data printed on 07-Sep-93

Vegetative vigor - plant dry weight (gm)

Compound - Glyphosate

Study Number - 93235 (cont.)

Treatment date - August 11, 1993

Plant collection date - September 1, 1993

Days after treatment - 21

Test system - Tomato

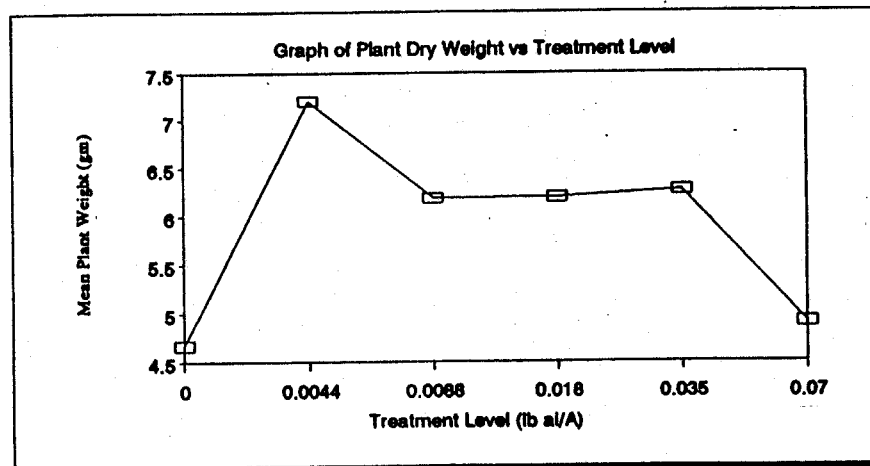
Comments:

Dunnett's Procedure

Comparison	Difference	Signif	D (crit diff)
Grp 1 vs Grp 2	0.00	NS	1.61
Grp 1 vs Grp 3	0.00	NS	1.61
Grp 1 vs Grp 4	0.00	NS	1.61
Grp 1 vs Grp 5	0.00	NS	1.61
Grp 1 vs Grp 6	0.00	NS	1.61

NS - Not significant at alpha 0.05

S - Significant at alpha 0.05



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US EPA ARCHIVE DOCUMENT

Title Randomized Block Analysis of an 8 Treatment 4 Rep Design with Dunnett's Comparison
Date 12 Jul 93

Vegetative vigor - Plant dry weight (gm)
Compound - Diphosphate
Treatment date - June 16, 1993
Days after treatment - 21
Study Number - 93235
Plant collection date - July 7, 1993
Test system - Cucumber

Comments

One-tailed Dunnett value - 2.51
NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Dunnett's Procedure

Comparison	Difference	Signif	D (crit 4df)
Grp 1 vs Grp 2	0.00	NS	1.79
Grp 1 vs Grp 3	0.00	NS	1.79
Grp 1 vs Grp 4	0.91	NS	1.79
Grp 1 vs Grp 5	3.26	S	1.79
Grp 1 vs Grp 6	3.37	S	1.79
Grp 1 vs Grp 7	7.20	S	1.79
Grp 1 vs Grp 8	8.16	S	1.79

Treatment (lb seed)	Rep	Replicate Values				Mean Plant Wt (gm)	Std Dev	Percent Effect
		Time Wt (gm)	Total Wt (gm)	Plant Wt (gm)	Mean Wt (gm)			
0.0	1	3.533	11.426	7.873	8.473	1.192		NA
	2	3.767	12.095	8.328				
	3	3.500	11.063	7.563				
	4	3.799	13.957	10.158				
0.070	1	3.538	12.766	9.208	8.946	0.696		6
	2	3.792	12.662	8.870				
	3	3.571	11.346	7.777				
	4	3.780	13.716	9.936				
0.14	1	3.568	13.669	10.101	8.566	1.561		1
	2	3.773	13.472	9.699				
	3	3.573	11.043	7.470				
	4	3.780	10.774	6.994				
0.28	1	3.576	11.987	8.411	7.567	1.118		-11
	2	3.780	9.945	6.063				
	3	3.539	10.923	7.364				
	4	3.771	12.196	8.427				
0.56	1	3.577	9.371	5.794	5.191	0.631		-39
	2	3.774	9.333	5.561				
	3	3.593	8.629	5.036				
	4	3.784	8.156	4.372				
1.1	1	3.594	6.019	2.425	3.103	1.147		-43
	2	3.785	6.435	2.670				
	3	3.592	6.092	2.500				
	4	3.775	8.592	4.817				
2.3	1	3.584	5.311	1.727	1.272	0.646		-85
	2	3.774	5.282	1.488				
	3	3.595	5.151	1.556				
	4	3.779	4.094	0.315				
4.5	1	3.595	3.955	0.360	0.317	0.262		-96
	2	3.792	4.428	0.636				
	3	3.598	3.861	0.273				
	4	3.801	0.000	0.000				

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Pat-Ag #: 93235

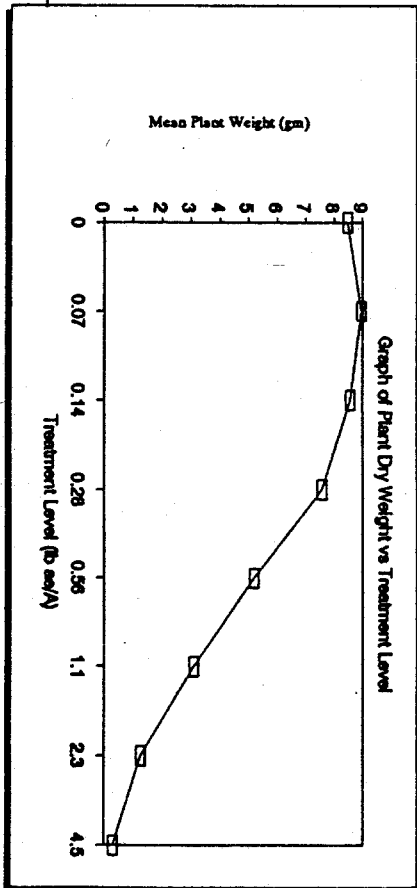
Analysis of Variance (Plant Dry Weight)
Source df SS MS F (critical value) = 2.49
F-value Signif

Total	31	364.10623	46.53721	47.85	S
Treatment	7	339.70045	48.52863		
Block (rep)	3	3.04232	1.01417		
Error	21	21.30336	1.01444		

NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Data entered by DHS
Data printed on 12 Jul 93

Verified by RJC



Title: Randomized Block Analysis of an 8 Treatment 4 Rep Design with Dunnett's Comparison
Date: 12-Jul-93

Treatment (lb ae/A)	Rep	Replicate Values			Mean Plant Wt.(gm)	Std. Dev.	Percent Effect
		Tare Wt.(gm)	Total Wt.(gm)	plant Wt.(gm)			
0.0	1	3.567	8.052	4.485	4.951	0.612	NA
	2	3.776	8.220	4.444			
	3	3.550	8.691	5.141			
	4	3.783	9.517	5.734			
0.070	1	3.562	8.623	5.061	4.703	0.348	-5
	2	3.788	8.188	4.400			
	3	3.552	8.494	4.942			
	4	3.787	8.195	4.408			
0.14	1	3.549	8.996	5.447	4.822	0.896	-3
	2	3.797	8.540	4.743			
	3	3.529	7.114	3.585			
	4	3.794	9.308	5.514			
0.28	1	3.541	7.541	4.000	3.786	0.240	-24
	2	3.789	7.400	3.611			
	3	3.540	7.087	3.547			
	4	3.796	7.780	3.984			
0.56	1	3.538	6.752	3.214	2.834	0.696	-43
	2	3.792	6.915	3.123			
	3	3.550	6.756	3.206			
	4	3.796	5.587	1.791			
1.1	1	3.552	4.419	0.867	0.634	0.230	-87
	2	3.785	4.509	0.724			
	3	3.556	4.176	0.620			
	4	3.783	4.108	0.325			
2.3	1	3.555	3.781	0.226	0.208	0.097	-96
	2	3.779	4.077	0.298			
	3	3.556	3.792	0.236			
	4	3.797	3.868	0.071			
4.5	1	3.549	3.733	0.184	0.083	0.070	-98
	2	3.781	3.812	0.031			
	3	3.559	3.603	0.044			
	4	3.777	3.851	0.074			

Analysis of Variance (Plant Dry Weight)

F (critical value) =

2.49

Source	df	SS	MS	F value	Signif
Total	31	134.05319			
Treatments	7	128.33233	18.33319	72.12	S
Blocks (reps)	3	0.36292	0.12764		
Error	21	5.33794	0.25419		

NS - Not significant at alpha 0.05

S - Significant at alpha 0.05

Data entered by DAGVerified by RSL

Data printed on 12-Jul-93

Vegetative vigor - Plant dry weight (gm)

Compound - Glyphosate

Study Number - 93235

Treatment date - June 16, 1993

Plant collection date - July 7, 1993

Days after treatment - 21

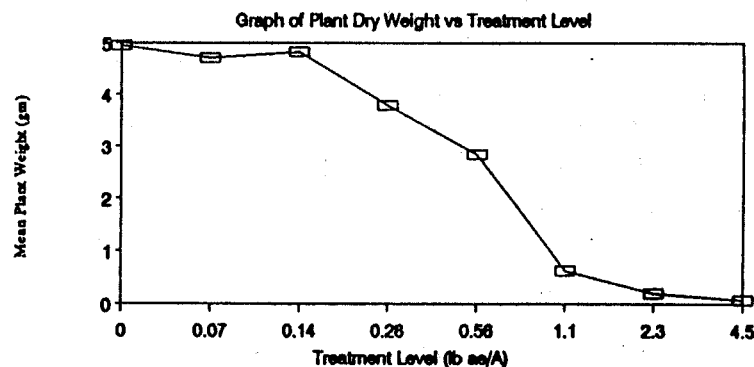
Test system - Cabbage

Comments:

One-sided Dunnett value - 2.51
NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Dunnett's Procedure

Comparison	Difference	Signif	D (crit diff)
Grp 1 vs Grp 2	0.25	NS	0.89
Grp 1 vs Grp 3	0.13	NS	0.89
Grp 1 vs Grp 4	1.16	S	0.89
Grp 1 vs Grp 5	2.12	S	0.89
Grp 1 vs Grp 6	4.32	S	0.89
Grp 1 vs Grp 7	4.74	S	0.89
Grp 1 vs Grp 8	4.87	S	0.89



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Title: Randomized Block Analysis of an 8 Treatment 4 Rep Design with Dunnett's Comparison
Date: 12-Jul-93

Treatment (lb aa/A)	Rep	Replicate Values			Mean Plant Wt.(gm)	Std. Dev.	Percent Effect
		Tare Wt.(gm)	Total Wt.(gm)	plant Wt.(gm)			
0.0	1	3.543	7.948	4.405	4.151	0.479	NA
	2	3.771	7.961	4.190			
	3	3.547	8.088	4.541			
	4	3.765	7.231	3.466			
0.070	1	3.555	7.859	4.304	4.036	0.284	-3
	2	3.753	7.729	3.976			
	3	3.534	7.216	3.682			
	4	3.755	7.956	4.201			
0.14	1	3.545	7.332	3.787	4.056	0.204	-2
	2	3.756	8.034	4.278			
	3	3.552	7.666	4.114			
	4	3.757	7.800	4.043			
0.28	1	3.549	7.005	3.456	3.432	0.300	-17
	2	3.751	6.773	3.022			
	3	3.552	7.059	3.507			
	4	3.756	7.498	3.742			
0.56	1	3.549	6.866	3.317	2.965	0.291	-29
	2	3.759	6.603	2.844			
	3	3.545	6.604	3.059			
	4	3.773	6.412	2.639			
1.1	1	3.547	4.199	0.652	1.402	0.517	-66
	2	3.771	5.259	1.488			
	3	3.552	5.369	1.817			
	4	3.766	5.415	1.649			
2.3	1	3.557	3.824	0.267	0.342	0.108	-92
	2	3.772	4.008	0.236			
	3	3.550	3.954	0.404			
	4	3.773	4.235	0.462			
4.5	1	3.550	3.688	0.138	0.247	0.100	-94
	2	3.778	4.133	0.355			
	3	3.546	3.852	0.306			
	4	3.782	3.972	0.190			

Vegetative vigor - Plant dry weight (gm)

Compound - Glyphosate

Treatment date - June 16, 1993

Days after treatment - 21

Study Number - 93235

Plant collection date - July 7, 1993

Test system - Out

Comments:

One-sided Dunnett value - 2.51
NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Dunnett's Procedure

Comparison	Difference	Signif	D (crit diff)
Grp 1 vs Grp 2	0.12	NS	0.59
Grp 1 vs Grp 3	0.09	NS	0.59
Grp 1 vs Grp 4	0.72	S	0.59
Grp 1 vs Grp 5	1.19	S	0.59
Grp 1 vs Grp 6	2.75	S	0.59
Grp 1 vs Grp 7	3.81	S	0.59
Grp 1 vs Grp 8	3.90	S	0.59

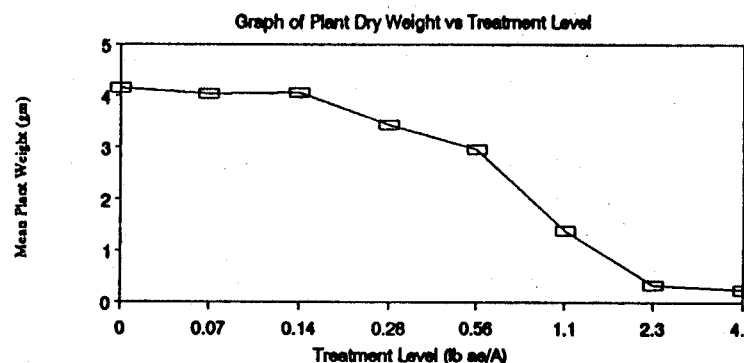
Analysis of Variance (Plant Dry Weight)				F (critical value) = 2.49	
Source	df	SS	MS	F value	Signif
Total	31	80.34517			
Treatments	7	77.89754	11.12822	99.63	S
Blocks(reps)	3	0.10194	0.03398		
Error	21	2.34569	0.11170		

NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Data entered by JRG

Verified by RS C

Data printed on 12-Jul-93



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Title: Randomized Block Analysis of an 8 Treatment 4 Rep Design with Dunnett's Comparison
Date: 12 Jul 93

Treatment (lb ae/A)	Rep	Replicate Values			Mean Plant Wt.(gm)	Std. Dev.	Percent Effect
		Tare Wt.(gm)	Total Wt.(gm)	plant Wt.(gm)			
0.0	1	3.549	4.427	0.878	0.833	0.157	NA
	2	3.783	4.437	0.654			
	3	3.549	4.573	1.024			
	4	3.785	4.559	0.774			
0.070	1	3.554	4.664	1.110	1.159	0.059	39
	2	3.773	4.968	1.195			
	3	3.545	4.653	1.108			
	4	3.785	5.008	1.223			
0.14	1	3.563	4.876	1.313	1.249	0.053	50
	2	3.785	4.973	1.188			
	3	3.564	4.792	1.228			
	4	3.785	5.051	1.266			
0.28	1	3.571	4.788	1.217	1.058	0.135	27
	2	3.783	4.753	0.970			
	3	3.565	4.490	0.925			
	4	3.781	4.899	1.118			
0.56	1	3.563	4.377	0.814	0.859	0.047	3
	2	3.785	4.695	0.910			
	3	3.563	4.388	0.825			
	4	3.788	4.677	0.889			
1.1	1	3.559	4.207	0.648	0.517	0.144	-38
	2	3.769	4.404	0.635			
	3	3.566	3.967	0.401			
	4	3.787	4.171	0.384			
2.3	1	3.566	3.628	0.062	0.074	0.040	-91
	2	3.783	3.900	0.117			
	3	3.561	3.585	0.024			
	4	3.774	3.867	0.093			
4.5	1	3.561	3.593	0.032	0.021	0.008	-97
	2	3.776	3.790	0.014			
	3	3.572	3.589	0.017			
	4	3.775	3.797	0.022			

Analysis of Variance (Plant Dry Weight) F (critical value) = 2.49

Source	df	SS	MS	Fvalue	Signif
Total	31	6.48107			
Treatments	7	6.25982	0.89426	92.60	S
Blocks(rep)	3	0.01844	0.00615		
Error	21	0.20281	0.00966		

NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Data entered by DAG

Data printed on 12-Jul-93

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Vegetative vigor - Plant dry weight (gm)

Compound - Glyphosate

Treatment date - June 16, 1993

Days after treatment - 21

Study Number - 93235

Plant collection date - July 7, 1993

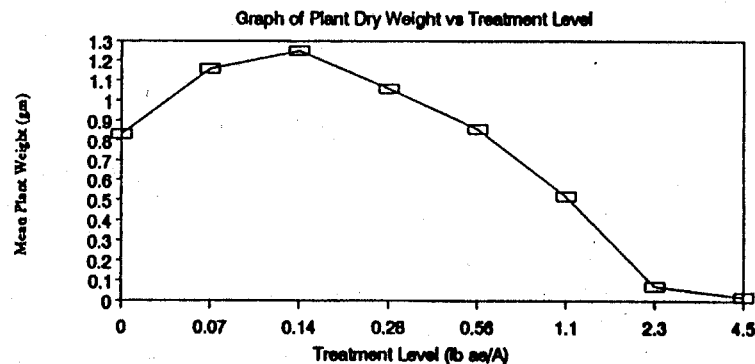
Test system - Ryegrass

Comments

One-sided Dunnett value - 251
NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Dunnett's Procedure

Comparison	Difference	Signif	D (ark diff)
Grp 1 vs Grp 2	0.00	NS	0.17
Grp 1 vs Grp 3	0.00	NS	0.17
Grp 1 vs Grp 4	0.00	NS	0.17
Grp 1 vs Grp 5	0.00	NS	0.17
Grp 1 vs Grp 6	0.32	S	0.17
Grp 1 vs Grp 7	0.76	S	0.17
Grp 1 vs Grp 8	0.81	S	0.17



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Title Randomized Block Analysis of an 8 Treatment 4 Rep Design with Dunnett's Comparison
Date 25-Aug-93

Treatment (lb aai/A)	Rep	Replicate Values				Mean	SD	Percent Error
		Tare Wt.(gm)	Total Wt.(gm)	Plant Wt.(gm)	Mean			
6.0	1	3.564	9.119	5.555	7.237	1.244	NA	
	2	3.788	12.341	8.553				
	3	3.539	10.875	7.334				
	4	3.781	11.287	7.506				
0.070	1	3.545	11.637	8.112	7.294	1.290	2	
	2	3.780	9.432	5.652				
	3	3.547	12.130	8.583				
	4	3.803	11.039	7.227				
0.14	1	3.533	11.634	8.101	7.629	2.238	5	
	2	3.806	14.432	10.626				
	3	3.544	9.630	6.086				
	4	3.806	9.508	5.702				
0.28	1	3.551	7.706	4.155	6.246	2.624	-14	
	2	3.811	13.823	10.012				
	3	3.537	8.378	4.819				
	4	3.802	9.799	5.997				
0.56	1	3.544	10.369	6.825	5.547	1.194	-23	
	2	3.777	9.522	5.745				
	3	3.531	9.211	5.680				
	4	3.787	7.725	3.938				
1.1	1	3.539	4.300	0.761	0.655	0.200	-91	
	2	3.779	4.647	0.868				
	3	3.544	3.963	0.419				
	4	3.787	4.337	0.570				
2.3	1	3.547	3.888	0.341	0.085	0.170	-99	
	2	3.777	0.000	0.000				
	3	3.544	0.000	0.000				
	4	3.781	0.000	0.000				
4.5	1	3.554	3.925	0.371	0.175	0.164	-98	
	2	3.782	4.023	0.241				
	3	3.547	3.637	0.090				
	4	3.770	0.000	0.000				

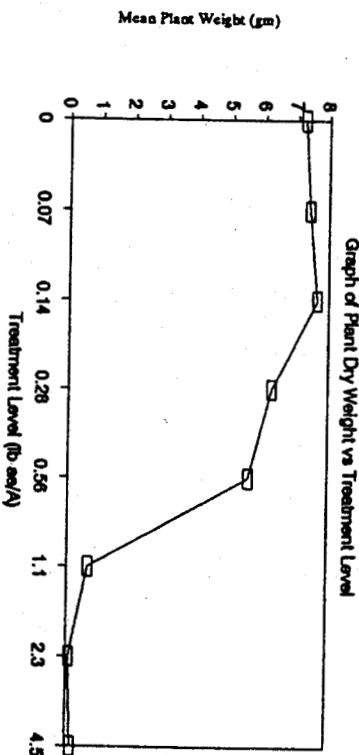
Analysis of Variance (Plant Dry Weight)

Source	df	SS	MS	F-value	Signif
Total	31	380.72242			
Treatments	7	130.56023	18.65146	23.66	S
Block (rep)	3	8.23631	2.74530		
Error	21	41.91699	1.99603		

NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Data entered by DHG
Data printed on 25-Aug-93

Verified by RSC



Dunnett's Procedure

Comparison	Difference	Signif	D (crit 4.87)
Grp 1 vs Grp 2	0.00	NS	2.31
Grp 1 vs Grp 3	0.00	NS	2.31
Grp 1 vs Grp 4	0.09	NS	2.31
Grp 1 vs Grp 5	1.69	NS	2.31
Grp 1 vs Grp 6	6.38	S	2.31
Grp 1 vs Grp 7	7.15	S	2.31
Grp 1 vs Grp 8	7.06	S	2.31

One-sided Dunnett value - 2.31
NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Vegetative vigor - Plant dry weight (gm)
Compound - Glyphosate
Treatment date - June 16, 1993
Days after treatment - 21
Study Number - 90235
Plant collection date - July 7, 1993
Test system - Corn

Title Randomized Block Analysis of an 8 Treatment 4 Rep Design with Dunnett's Comparison
Date 12-Jul-93

Treatment (b se/A)	Rep	Replicate Values			Mean	Std Dev.	Percent Effect
		Tree Wt.(gm)	Total Wt.(gm)	Plant Wt.(gm)			

0.0	1	3.540	4.689	1.149	0.955	0.181	NA
	2	3.774	4.529	0.755			
	3	3.534	4.391	0.857			
	4	3.779	4.838	1.059			
0.070	1	3.521	4.348	0.827	0.994	0.126	4
	2	3.768	4.867	1.119			
	3	3.538	4.512	0.974			
	4	3.766	4.821	1.055			
0.14	1	3.533	4.574	1.041	1.094	0.078	15
	2	3.762	4.776	1.014			
	3	3.538	4.710	1.172			
	4	3.772	4.922	1.150			
0.28	1	3.530	4.556	0.836	0.857	0.049	-10
	2	3.785	4.585	0.800			
	3	3.535	4.462	0.927			
	4	3.754	4.607	0.853			
0.56	1	3.561	4.569	1.008	1.063	0.062	11
	2	3.756	4.838	1.082			
	3	3.544	4.562	1.018			
	4	3.757	4.899	1.142			
1.1	1	3.542	4.280	0.737	0.567	0.127	-41
	2	3.764	4.281	0.497			
	3	3.552	4.173	0.621			
	4	3.778	4.211	0.433			
2.3	1	3.544	3.927	0.383	0.274	0.124	-71
	2	3.771	4.147	0.376			
	3	3.567	3.767	0.200			
	4	3.773	3.911	0.138			
4.5	1	3.556	3.690	0.134	0.162	0.031	-83
	2	3.770	3.951	0.181			
	3	3.558	3.754	0.196			
	4	3.778	3.915	0.137			

MSL- 1 3 3 2 0

Plant Ag #: 93235

Analysis of Variance (Plant Dry Weight)				F (critical value) =	2.09
Source	df	SS	MS	F value	Signif

Total	31	4.01793				
Treatments	7	3.75746	0.53922	40.50	S	
Block (rep)	3	0.00363	0.00121			
Error	21	0.27064	0.01291			

NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Data entered by WES
Data printed on 12-Jul-93

Verified by RSC

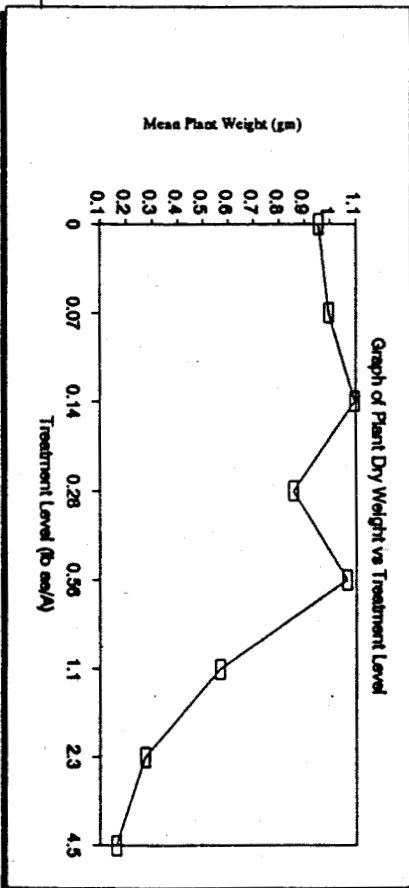
Vegetable type - Plant dry weight (gm)
Compound - 014000000
Treatment date - June 16, 1993
Days after treatment - 21
Seedling Number - 93235
Plant collection date - July 7, 1993
Test system - Online

Comments

One-sided Dunnett value - 2.51
NS - Not significant at alpha 0.05
S - Significant at alpha 0.05

Dunnett's Procedure

Comparison	Difference	Signif	D (crit 4df)
Grp 1 vs Grp 2	0.00	NS	0.20
Grp 1 vs Grp 3	0.00	NS	0.20
Grp 1 vs Grp 4	0.10	NS	0.20
Grp 1 vs Grp 5	0.00	NS	0.20
Grp 1 vs Grp 6	0.39	S	0.20
Grp 1 vs Grp 7	0.68	S	0.20
Grp 1 vs Grp 8	0.79	S	0.20



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