

3-1-99

MRID No. 443074-52

DATA EVALUATION RECORD
SEEDLING EMERGENCE TEST
S 123-1 (TIER II)

005107 K
005108

1. **CHEMICAL:** SAN 1269H (Diflufenzopyr+Dicamba) PC Code No.: Not reported
55% dicamba sodium salt and 21.9% diflufenzopyr sodium salt
2. **TEST MATERIAL:** 51% dicamba acid and 20% SAN 836H acid equivalents
50% equivalents

3. **CITATION:**

Author: J.R. Hoberg
Title: SAN 1269H: Determination of Effects on
Seedling Emergence and Vegetative Vigor
of Ten Plant Species

Study Completion Date: November 13, 1996

Laboratory: Springborn Laboratories, Inc., Wareham,
MA

Sponsor: Sandoz Agro, Inc., Des Plaines, IL

Laboratory Report ID: 96-6-6535

MRID No.: 443074-52

DP Barcode: D239665

R. Gallagher
3/99

4. **REVIEWED BY:** Mark Mossler, M.S., Toxicologist,
Golder Associates Inc.

Signature: 

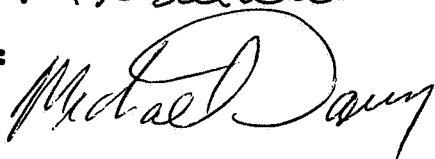
Date: 2/26/98

APPROVED BY: Pim Kosalwat, Ph.D., Senior Scientist
Golder Associates Inc.

Signature: P. Kosalwat

Date: 2/26/98

5. **APPROVED BY:**

Signature: 

Date: 7/10/98

6. **STUDY PARAMETERS:**

Definitive Study Duration: 14 days

7. **CONCLUSIONS:** This study is scientifically sound and fulfills
the guideline requirements for a Tier II seedling emergence
study with terrestrial plants.

Results Synopsis:

Most sensitive monocot: Ryegrass

Most sensitive parameter: Shoot length

EC₂₅: 0.051 lb ae/A

NOEL: 0.024 lb ae/A

20 total

changed electronic copy test
material description to match
edits above K 3/99

Most sensitive dicot: Turnip
 Most sensitive parameter: Shoot length
 EC₂₅: 0.0008 lb ae/A
 NOEL: 0.0001 lb ae/A

8. ADEQUACY OF THE STUDY:

A. Classification: Core.

B. Rationale: N/A.

C. Repairability: N/A.

9. **GUIDELINE DEVIATIONS:** No guideline deviations of consequence were noted.

10. SUBMISSION PURPOSE:**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.	<u>Dicots</u> : cabbage, cucumber, lettuce, soybean, tomato, turnip <u>Monocots</u> : corn, oat, onion, ryegrass
Number of seeds per rep 10	10
Source of Seed	Untreated seed obtained from various commercial suppliers
Historical % Germination of Seed	≥84%

B. Test System

Guideline Criteria	Reported Information
Solvent	None
Site of test	Growth chamber

Guideline Criteria	Reported Information
Planting method / type of pot	Planted at 1.0-cm depth/ polypropylene pots (13-cm top diameter)
Method of application	200 mL of solution applied to each pot
Method of watering	Subirrigation
Growth stage at application Seed or plant.	Seed

C. Test Design

Guideline Criteria	Reported Information
Dose range 2x or 3x	2x
Doses At least 5	5, 6, or 7 - rates ranging from 0.0010 to 0.25 lb of acid equivalents (ae)/A
Controls Negative and solvent	Negative (nutrient solution) control
Replicates per dose At least 3	3
Duration of test 14 days	14 days
Were observations made at least weekly?	Observations made on days 10 and 14
Maximum labeled rate	0.20 lb ae/A

12. REPORTED RESULTS:

Guideline Criteria	Reported Information
Quality assurance and GLP compliance statements were included in the report?	Yes
Was an NOEL observed for each species?	Yes

Guideline Criteria	Reported Information
Phytotoxic observations	Yes
Were initial chemical concentrations measured? (Optional)	The measured concentrations ranged from 85 to 98% of nominal.
Were adequate raw data included?	Raw data for phytotoxicity observations were not included in the report.

Results for the most sensitive parameter* of each species

Species	Parameter	EC ₂₅ (lb ae/A)	NOEL (lb ae/A)
Cabbage	shoot length	0.0072	0.0036
Cucumber	"	0.0038	0.0018
Lettuce	"	0.0014	0.0003
Soybean	"	0.0050	0.0036
Tomato	"	0.10	0.028
Turnip	"	0.0022	0.0018
Corn	"	0.17	0.028
Oat	"	0.032	0.0068
Onion	"	0.086	0.058
Ryegrass	"	0.0052	0.0018

*Determination of the most sensitive parameter is based on EC₂₅ values.

Observations: Symptoms of test material toxicity included chlorosis, necrosis, leaf curl, stem bend, stunted growth, and roots protruding from the pots.

Statistical Method: Analyses were based on measured application rates. Dunnett's test was used for mean separation and regression analysis (with or without various transformations) was used for EC value determination.

Most sensitive dicot: lettuce Parameter: shoot length
EC₂₅ 95% C.L.: 0.0003 - 0.0057 lb ae/A Probit Slope: N/A

Most sensitive monocot: ryegrass Parameter: shoot length
 EC₂₅ 95% C.L.: 0.0017 - 0.015 lb ae/A Probit Slope: N/A

13. **VERIFICATION OF STATISTICAL RESULTS:** Williams' test was used for mean separation. Probit analysis or linear interpolation was used for EC₂₅ estimation. Where appropriate, responses for the most sensitive parameter for each species were remodeled using non-linear regression.

Species	Parameter	EC ₂₅ (lb ae/A)	NOEL (lb ae/A)
Cabbage	shoot length	0.0071	0.0036
Cucumber	"	0.0022	0.0018
Lettuce	"	0.0019	0.0002*
Soybean	"	0.0043	0.0018
Tomato	phytotoxicity	0.040**	0.028***
Turnip	shoot length	0.0008	0.0001*
Corn	phytotoxicity	0.0069	0.0030*
Oat	shoot length	0.030	0.004*
Onion	"	0.089	0.028
Ryegrass	"	0.0055	0.0018

*The EC₅ value from the probit analysis.

**Linear interpolation.

***Visual interpretation.

Results for most sensitive parameter of most sensitive species

	Monocot	Dicot
Species	ryegrass	turnip
Parameter	shoot length	shoot length
EC ₂₅ (lb ae/A)	0.0052	0.0008
95% C.I. (lb ae/A)	0.0017 - 0.015	0.0003 - 0.0024
Probit Slope	N/A	N/A
NOEL (lb ae/A)	0.0018	0.0001

14. REVIEWER'S COMMENTS: This study is scientifically sound and fulfills the guideline requirements. The study is classified as **Core**.

cabbage shoot length

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WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	Control	3	3.367	3.367	3.400
2	0.0018 lb ae/A	3	3.433	3.433	3.400
3	0.0036 lb ae/A	3	3.200	3.200	3.200
4	0.0068 lb ae/A	3	2.667	2.667	2.667
5	0.016 lb ae/A	3	2.000	2.000	2.000
6	0.028 lb ae/A	3	1.200	1.200	1.200
7	0.058 lb ae/A	3	1.033	1.033	1.033

cabbage shoot length

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WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
Control	3.400				
0.0018 lb ae/A	3.400	0.187		1.76	k= 1, v=14
0.0036 lb ae/A	3.200	0.935		1.85	k= 2, v=14
0.0068 lb ae/A	2.667	3.929	*	1.88	k= 3, v=14
0.016 lb ae/A	2.000	7.670	*	1.89	k= 4, v=14
0.028 lb ae/A	1.200	12.160	*	1.90	k= 5, v=14
0.058 lb ae/A	1.033	13.096	*	1.91	k= 6, v=14

s = 0.218

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

NOEL = 0.0036 lb ae/A

cabbage shoot length

Estimated EC Values and Confidence Limits

Point	Conc.	Lower	Upper
		95% Confidence Limits	95% Confidence Limits
EC 1.00	0.0009	0.0004	0.0014
EC 5.00	0.0022	0.0014	0.0031
EC10.00	0.0036	0.0025	0.0048
EC15.00	0.0051	0.0037	0.0065
EC50.00	0.0214	0.0181	0.0257
EC85.00	0.0893	0.0660	0.1359
EC90.00	0.1253	0.0884	0.2043
EC95.00	0.2068	0.1359	0.3748
EC99.00	0.5293	0.3031	1.1755

$$EC_{25} = 0.0085 \text{ lb ae/A}$$

2.5

2.0

1.5

1.0

0.5

-2.6 -2.4 -2.2 -2.0 -1.8 -1.6 -1.4 -1.2

LOG_CONC

NOTE: 1235 obs had missing values. 1158 obs hidden.

cabbage shoot length
COMPARISON OF MEANS FOR NOEL DETERMINATION
TEST IF TREATMENT IS LESS THAN CONTROL

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General Linear Models Procedure
Class Level Information

Class	Levels	Values
DOSE	6	0 0.016 0.028 0.058 0.0036 0.0068

Number of observations in data set = 36

NOTE: Due to missing values, only 18 observations can be used in this analysis.

cabbage shoot length
COMPARISON OF MEANS FOR NOEL DETERMINATION
TEST IF TREATMENT IS LESS THAN CONTROL

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General Linear Models Procedure

Dependent Variable: RESPONSE

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	14.90444444	2.98088889	63.88	0.0001
Error	12	0.56000000	0.04666667		
Corrected Total	17	15.46444444			

R-Square	C.V.	Root MSE	RESPONSE Mean
0.963788	9.624862	0.216025	2.244444

Source	DF	Type I SS	Mean Square	F Value	Pr > F
DOSE	5	14.90444444	2.98088889	63.88	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
DOSE	5	14.90444444	2.98088889	63.88	0.0001

cabbage shoot length
COMPARISON OF MEANS FOR NOEL DETERMINATION
TEST IF TREATMENT IS LESS THAN CONTROL

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General Linear Models Procedure

Level of DOSE	N	Mean	SD
0	3	3.36666667	0.15275252
0.016	3	2.00000000	0.26457513
0.028	3	1.20000000	0.10000000
0.058	3	1.03333333	0.11547005
0.0036	3	3.20000000	0.34641016
0.0068	3	2.66666667	0.20816660

cabbage shoot length
COMPARISON OF MEANS FOR NOEL DETERMINATION
TEST IF TREATMENT IS LESS THAN CONTROL

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General Linear Models Procedure

Dunnett's One-tailed T tests for variable: RESPONSE

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 12 MSE= 0.046667
Critical Value of Dunnett's T= 2.502
Minimum Significant Difference= 0.4413

Comparisons significant at the 0.05 level are indicated by ****.

DOSE Comparison	Simultaneous Confidence Limit		Difference Between Means	Simultaneous Upper Confidence Limit	
	Lower Limit	Upper Limit		Lower Limit	Upper Limit
0.0036 - 0	-0.6080	-0.1667	-0.1667	0.2747	***
0.0068 - 0	-1.1413	-0.7000	-0.7000	-0.2587	***
0.016 - 0	-1.8080	-1.3667	-1.3667	-0.9253	***
0.028 - 0	-2.6080	-2.1667	-2.1667	-1.7253	***
0.058 - 0	-2.7747	-2.3333	-2.3333	-1.8920	***

cucumber shoot length

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WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	Control	3	10.967	10.967	10.967
2	0.0018 lb ae/A	3	10.600	10.600	10.600
3	0.0036 lb ae/A	3	7.500	7.500	7.500
4	0.0068 lb ae/A	3	5.867	5.867	5.983
5	0.016 lb ae/A	3	6.100	6.100	5.983
6	0.028 lb ae/A	3	5.533	5.533	5.533
7	0.058 lb ae/A	3	3.667	3.667	3.667

cucumber shoot length

File: cuc 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	10.967				
0.0018 lb ae/A	10.600	0.503		1.76	k= 1, v=14
0.0036 lb ae/A	7.500	4.754	*	1.85	k= 2, v=14
0.0068 lb ae/A	5.983	6.834	*	1.88	k= 3, v=14
0.016 lb ae/A	5.983	6.834	*	1.89	k= 4, v=14
0.028 lb ae/A	5.533	7.451	*	1.90	k= 5, v=14
0.058 lb ae/A	3.667	10.011	*	1.91	k= 6, v=14

s = 0.893

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

NOEL = 0.0018 lb ae/A

11

cucumber shoot length

Estimated EC Values and Confidence Limits

Point	Conc.	Lower 95% Confidence	Upper Limits
EC 1.00	0.0000	0.0000	0.0001
EC 5.00	0.0001	0.0000	0.0004
EC10.00	0.0003	0.0000	0.0010
EC15.00	0.0006	0.0001	0.0017
EC50.00	0.0192	0.0125	0.0311
EC85.00	0.5794	0.1968	6.7432
EC90.00	1.2979	0.3534	25.7103
EC95.00	4.2877	0.8372	187.7842
EC99.00	40.3275	4.1853	7886.5024

$EC_{25} = 0.0021 \text{ lb ae/A}$

OBS	CONC	LOG_CONC	Y1	Y2	Y3	Y4	Y5	Y6	11
1	0.0000	-2.44370	10.30	10.00	12.60	.	.	.	11
2	0.0036	-1.94310	7.20	7.10	8.20	.	.	.	09:18 Wednesday, February 11, 1998
3	0.0114	-1.55284	6.15	5.15	6.65	.	.	.	
4	0.0280	-1.23657	3.80	3.40	7.00	.	.	.	
5	0.0580	-1.23657	3.80	3.40	3.80	.	.	.	

MODEL: COUNT = CO * PROBLOG (LOG_EC50 - LOG_CONC) / SIGMA

WEIGHTED REGRESSION

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Iter	LOG_EC50	SIGMA	Weighted SS	12
0	-1.717000	1.429000	10.970000	
1	-1.720899	1.398716	10.935091	
2	-1.720516	1.397962	10.933667	
3	-1.720506	1.397921	10.933620	
4	-1.720506	1.397919	10.933618	
5	-1.720506	1.397919	10.933618	

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics

Source	DF	Weighted SS	Weighted MS	Dependent Variable COUNT
Regression	3	100.95000000	33.65000000	
Residual	12	1.66059486	0.13838290	
Uncorrected Total	15	102.61059486		
(Corrected Total)	14	13.23146757		

Parameter	Estimate	Asymptotic Std. Error	Confidence Interval Lower	Confidence Interval Upper	Asymptotic 95 %
LOG_EC50	-1.72050563	0.14611146884	-2.0388556397	-1.402155616	
SIGMA	1.39791877	0.30051344869	0.7431552467	2.052682291	
CO	10.93361770	0.70869277019	9.3895065269	12.477728876	

Asymptotic Correlation Matrix

Corr	LOG_EC50	SIGMA	CO
LOG_EC50	1		
SIGMA	-0.345953605	1	
CO	-0.818114849	0.3453372076	1

MODEL: COUNT = CO * PROBLOG (LOG_EC50 - LOG_CONC) / SIGMA

WEIGHTED REGRESSION

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OBS	CONC	LOG_EC50	SIGMA	CO	RESID_SS	EC50
1	0	-1.72051	1.39792	10.9336	1.66059	0.019032

MODEL: YOUNG = CO * PROBLOG (LOG_EC25 - LOG_CONC) / SIGMA - 0.67449

WEIGHTED REGRESSION

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Non-Linear Least Squares Iterative Phase

Dependent Variable COUNT Method: Gauss-Newton

LOG_EC25 SIGMA Weighted SS

OBS	CONC	LOG_CONC	Y1	Y2	Y3	Y4	Y5	Y6	11
1	0.0000	-2.44370	10.30	10.00	12.60	.	.	.	11
2	0.0036	-1.94310	7.20	7.10	8.20	.	.	.	09:18 Wednesday, February 11, 1998
3	0.0114	-1.55284	6.15	5.15	6.65	.	.	.	
4	0.0280	-1.23657	3.80	3.40	7.00	.	.	.	
5	0.0580	-1.23657	3.80	3.40	3.80	.	.	.	

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics

Source	DF	Weighted SS	Weighted MS	Dependent Variable COUNT
Regression	3	100.95000000	33.65000000	
Residual	12	1.66059486	0.13838290	
Uncorrected Total	15	102.61059486		
(Corrected Total)	14	13.23146757		

Parameter	Estimate	Asymptotic Std. Error	Confidence Interval Lower	Confidence Interval Upper	Asymptotic 95 %
LOG_EC25	-2.66338786	0.28796621272	-3.2908132606	-2.035965455	
SIGMA	1.39791877	0.30051344852	0.7431552465	2.052682290	
CO	10.93361770	0.70869277017	9.3895065263	12.477728875	

Asymptotic Correlation Matrix

Corr	LOG_EC25	SIGMA	CO
LOG_EC25	1		
SIGMA	-0.879412563	1	
CO	-0.658179667	0.3453372078	1

MODEL: YOUNG = CO * PROBLOG (LOG_EC25 - LOG_CONC) / SIGMA - 0.67449

SUMMARY OF NONLINEAR REGRESSION

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OBS	CONC	LOG_EC25	SIGMA	CO	RESID_SS	EC25
1	0	-2.66339	1.39792	10.9336	1.66059	.0021708

MODEL: YOUNG = CO * PROBLOG (LOG_EC25 - LOG_CONC) / SIGMA - 0.67449

SUMMARY OF NONLINEAR REGRESSION

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Plot of COUNT*LOG_CONC. Symbol used is 'O'.

Plot of PRED*LOG_CONC. Symbol used is 'O'.

COUNT

14

12

10

lettuce shoot length

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WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	Control	3	5.733	5.733	5.733
2	0.0009 lb ae/A	3	4.467	4.467	4.467
3	0.0018 lb ae/A	3	4.167	4.167	4.167
4	0.0036 lb ae/A	3	3.300	3.300	3.333
5	0.0068 lb ae/A	3	3.367	3.367	3.333
6	0.016 lb ae/A	3	2.367	2.367	2.367
7	0.028 lb ae/A	3	1.467	1.467	1.467

lettuce shoot length

File: let 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	5.733				
0.0009 lb ae/A	4.467	2.881	*	1.76	k= 1, v=14
0.0018 lb ae/A	4.167	3.563	*	1.85	k= 2, v=14
0.0036 lb ae/A	3.333	5.458	*	1.88	k= 3, v=14
0.0068 lb ae/A	3.333	5.458	*	1.89	k= 4, v=14
0.016 lb ae/A	2.367	7.657	*	1.90	k= 5, v=14
0.028 lb ae/A	1.467	9.704	*	1.91	k= 6, v=14

s = 0.539

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

$$NOEL = \text{prob.} \dot{E} C_5 = 0.0002 \text{ lb ae/A}$$

lettuce shoot length

Estimated EC Values and Confidence Limits

Point	Conc.	Lower	Upper
		95% Confidence Limits	Limits
EC 1.00	0.0000	0.0000	0.0001
EC 5.00	0.0002	0.0000	0.0005
EC10.00	0.0005	0.0001	0.0009
EC15.00	0.0008	0.0003	0.0014
EC50.00	0.0082	0.0061	0.0111
EC85.00	0.0833	0.0475	0.2144
EC90.00	0.1440	0.0737	0.4522
EC95.00	0.3240	0.1405	1.3732
EC99.00	1.4832	0.4679	11.1262

$$EC_{25} = 0.0018 \text{ } \mu\text{e/A}$$

OBS	CONC	LOG_CONC	Y1	Y2	Y3	Y4	Y5	Y6	21
1	0.0000	-2.74473	6.2	5.8	5.2	.	.	.	09:18 Wednesday, February 11, 1998
2	0.0018	-2.28400	4.8	4.1	3.6	.	.	.	
3	0.0052	-2.28400	3.8	3.5	2.7	.	.	.	
4	0.0160	-1.79588	2.1	2.4	2.6	.	.	.	
5	0.0280	-1.55284	1.3	1.8	1.3	.	.	.	

MODEL: COUNT = CO * PROBNOEM ((LOG_EC50 - LOG_CONC) / SIGMA)
 lettuce shoot length
 WEIGHTED REGRESSION

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Non-Linear Least Squares Iterative Phase									
Dependent Variable COUNT Method: Gauss-Newton									
Iter	LOG_EC50	SIGMA	CO	Weighted SS	Weighted MS	22			
0	-2.086000	0.971000	5.730000	0.738539	0.739410				
1	-2.091642	0.945677	5.693674	0.739410	0.739295				
2	-2.090814	0.944626	5.691601	0.739295	0.739292				
3	-2.090769	0.944537	5.691473	0.739293	0.739292				
4	-2.090765	0.944530	5.691463	0.739292	0.739292				
5	-2.090765	0.944529	5.691462	0.739292	0.739292				
6	-2.090765	0.944529	5.691462	0.739292	0.739292				

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics

Source	DF	Weighted SS	Weighted MS	Dependent Variable COUNT
Regression	3	51.200000000	17.066666667	
Residual	12	0.739292378	0.061607698	
Uncorrected Total	15	51.939292378		
(Corrected Total)	14	10.266165617		

Parameter	Estimate	Asymptotic Std. Error	Asymptotic 95 % Confidence Interval
LOG_EC50	-2.090764852	0.0972145004	-2.3025772548 -1.8789524489
SIGMA	0.944529139	0.14032518430	0.6387863763 1.2502719008
CO	5.691461926	0.33919750910	4.9524129525 6.4305108990

Asymptotic Correlation Matrix

Corr	LOG_EC50	SIGMA	CO
LOG_EC50	1		
SIGMA	-0.569404821	1	
CO	-0.813098585	0.4548115916	1

MODEL: COUNT = CO * PROBNOEM ((LOG_EC50 - LOG_CONC) / SIGMA)
 lettuce shoot length
 SUMMARY OF NONLINEAR REGRESSION

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OBS	CONC	LOG_EC50	SIGMA	CO	RESID_SS	EC50	23
1	0	-2.09076	0.94453	5.69146	0.73929	.0081140	
2	0	-2.09076	0.94453	5.69146	0.73929	.0081140	
3	0	-2.09076	0.94453	5.69146	0.73929	.0081140	
4	0	-2.09076	0.94453	5.69146	0.73929	.0081140	
5	0	-2.09076	0.94453	5.69146	0.73929	.0081140	

MODEL: YOUNG = CO * PROBNOEM ((LOG_EC50 - LOG_CONC) / SIGMA - 0.67449)
 lettuce shoot length
 SUMMARY OF NONLINEAR REGRESSION

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Non-Linear Least Squares Iterative Phase
 Dependent Variable COUNT Method: Gauss-Newton

Iter	LOG_EC25	SIGMA	CO	Weighted SS
0	-2.738000	0.971000	5.730000	0.739347
1	-2.729463	0.945621	5.693583	0.739430
2	-2.727951	0.944623	5.691596	0.739295
3	-2.727849	0.944536	5.691472	0.739293
4	-2.727841	0.944529	5.691463	0.739292
5	-2.727840	0.944529	5.691462	0.739292
6	-2.727840	0.944529	5.691462	0.739292

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics

Source	DF	Weighted SS	Weighted MS	Dependent Variable COUNT
Regression	3	51.200000000	17.066666667	
Residual	12	0.739292378	0.061607698	
Uncorrected Total	15	51.939292378		
(Corrected Total)	14	10.266165617		

Parameter	Estimate	Asymptotic Std. Error	Asymptotic 95 % Confidence Interval
LOG_EC25	-2.727840310	0.16996245269	-3.0981572283 -2.3575233924
SIGMA	0.944529138	0.14032518428	0.6387863762 1.2502719006
CO	5.691461926	0.33919750910	4.9524129523 6.4305108988

Asymptotic Correlation Matrix

Corr	LOG_EC25	SIGMA	CO
LOG_EC25	1		
SIGMA	-0.882561458	1	
CO	-0.718346359	0.4548115917	1

MODEL: YOUNG = CO * PROBNOEM ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
 lettuce shoot length
 SUMMARY OF NONLINEAR REGRESSION

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OBS	CONC	LOG_EC25	SIGMA	CO	RESID_SS	EC25	25
1	0	-2.72784	0.94453	5.69146	0.73929	.0018714	
2	0	-2.72784	0.94453	5.69146	0.73929	.0018714	
3	0	-2.72784	0.94453	5.69146	0.73929	.0018714	
4	0	-2.72784	0.94453	5.69146	0.73929	.0018714	
5	0	-2.72784	0.94453	5.69146	0.73929	.0018714	

Plot of COUNT*LOG_CONC. Symbol used is 'O'.
 Plot of PRED*LOG_CONC. Symbol used is 'O'.

COUNT

7

6

5

0

soybean shoot length

File: soy Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	Control	3	30.933	30.933	30.933
2	0.0009 lb ae/A	3	29.933	29.933	29.933
3	0.0018 lb ae/A	3	28.867	28.867	28.867
4	0.0036 lb ae/A	3	27.533	27.533	27.533
5	0.0068 lb ae/A	3	16.267	16.267	16.267
6	0.016 lb ae/A	3	6.733	6.733	6.733

soybean shoot length

File: soy 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	30.933				
0.0009 lb ae/A	29.933	0.644		1.78	k= 1, v=12
0.0018 lb ae/A	28.867	1.331		1.87	k= 2, v=12
0.0036 lb ae/A	27.533	2.190	*	1.90	k= 3, v=12
0.0068 lb ae/A	16.267	9.445	*	1.92	k= 4, v=12
0.016 lb ae/A	6.733	15.585	*	1.93	k= 5, v=12

s = 1.902

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

NDEL = 0.0018 lb ae/A

soybean shoot length

Estimated EC Values and Confidence Limits

Point	Conc.	Lower 95% Confidence	Upper Limits
EC 1.00	0.0013	0.0008	0.0019
EC 5.00	0.0023	0.0016	0.0029
EC10.00	0.0030	0.0023	0.0037
EC15.00	0.0036	0.0029	0.0043
EC50.00	0.0081	0.0072	0.0093
EC85.00	0.0182	0.0150	0.0240
EC90.00	0.0220	0.0176	0.0304
EC95.00	0.0292	0.0224	0.0432
EC99.00	0.0495	0.0348	0.0841

$$EC_{25} = 0.0649 \text{ } \mu\text{e/A}$$

soybean shoot length										61
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OBS	CONC	LOG_CONC	Y1	Y2	Y3	Y4	Y5	Y6		
1	0.0000		32.5	31.1	29.2	.	.	.		
2	0.0036	-2.44370	29.5	24.1	29.0	.	.	.		
3	0.0068	-2.16749	14.2	18.6	16.0	.	.	.		
4	0.0160	-1.79588	8.3	5.6	6.3	.	.	.		
soybean shoot length										62
MODEL: COUNT = CO * PROBNOEM ((LOG_EC50 - LOG_CONC) / SIGMA)										
WEIGHTED REGRESSION										
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Non-Linear Least Squares Iterative Phase

Iter	Dependent Variable COUNT	Method: Gauss-Newton	CO	Weighted SS
0	LOG_EC50	SIGMA		
-2.092000	0.337000		30.930000	3.222233
-2.112047	0.380109		31.734776	2.894683
-2.107814	0.375286		31.567735	2.889146
-2.108431	0.376129		31.588327	2.889569
-2.108329	0.375987		31.584861	2.889488
-2.108346	0.376011		31.585441	2.889501
-2.108343	0.376007		31.585343	2.889499
-2.108344	0.376008		31.585360	2.889499
-2.108344	0.376007		31.585357	2.889499
-2.108344	0.376008		31.585357	2.889499

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics

Source	DF	Weighted SS	Weighted MS	Dependent Variable COUNT
Regression	3	244.40000000	81.46666667	
Residual	9	2.88949917	0.32105546	
Uncorrected Total	12	247.28949917		
(Corrected Total)	11	76.18261655		

Parameter	Estimate	Asymptotic Std. Error	Confidence Interval Lower	Confidence Interval Upper	Asymptotic 95 %
LOG_EC50	-2.10834382	0.0428764869	-2.205337992	-2.011348638	
SIGMA	0.37600750	0.0467052291	0.270352037	0.481662972	
CO	31.58535732	1.7948406117	27.525111225	35.645603410	

Asymptotic Correlation Matrix

Corr	LOG_EC50	SIGMA	CO
LOG_EC50	1		
SIGMA	-0.605580779	1	
CO	-0.768884635	0.501208588	1

soybean shoot length
MODEL: COUNT = CO * PROBNOEM ((LOG_EC50 - LOG_CONC) / SIGMA)
SUMMARY OF NONLINEAR REGRESSION
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OBS	CONC	LOG_EC50	SIGMA	CO	RESID_SS	EC50
1	0	-2.10834	0.37601	31.5854	2.88950	.0077921

soybean shoot length
MODEL: YOUNG = CO * PROBNOEM ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
WEIGHTED REGRESSION
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21

Non-Linear Least Squares Iterative Phase						
Iter	LOG_EC25	SIGMA	CO	Weighted SS	Weighted MS	Dependent Variable COUNT
0	-2.374000	0.337000	30.930000	3.174343	2.894052	
1	-2.368046	0.380561	31.737847	2.889123	2.889575	
2	-2.360858	0.375226	31.566401	2.889123	2.889487	
3	-2.362140	0.376139	31.588573	2.889501	2.889501	
4	-2.361926	0.375986	31.584820	2.889501	2.889499	
5	-2.361962	0.376011	31.585447	2.889501	2.889499	
6	-2.361956	0.376007	31.585342	2.889499	2.889499	
7	-2.361957	0.376008	31.585360	2.889499	2.889499	
8	-2.361957	0.376007	31.585357	2.889499	2.889499	
9	-2.361957	0.376008	31.585357	2.889499	2.889499	

NOTE: Convergence criterion met.

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics

Source	DF	Weighted SS	Weighted MS	Dependent Variable COUNT
Regression	3	244.40000000	81.46666667	
Residual	9	2.88949917	0.32105546	
Uncorrected Total	12	247.28949917		
(Corrected Total)	11	76.18261654		

Parameter	Estimate	Asymptotic Std. Error	Confidence Interval Lower	Confidence Interval Upper	Asymptotic 95 %
LOG_EC25	-2.36195712	0.0688333992	-2.513146056	-2.210768178	
SIGMA	0.37600750	0.0467052291	0.270352037	0.481662973	
CO	31.58535732	1.7948406121	27.525111230	35.645603416	

Asymptotic Correlation Matrix

Corr	LOG_EC25	SIGMA	CO
LOG_EC25	1		
SIGMA	-0.859860296	1	
CO	-0.729519235	0.501208588	1

soybean shoot length
MODEL: YOUNG = CO * PROBNOEM ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
SUMMARY OF NONLINEAR REGRESSION
09:18 Wednesday, February 11, 1998

OBS	CONC	LOG_EC25	SIGMA	CO	RESID_SS	EC25
1	0	-2.36196	0.37601	31.5854	2.88950	.0043455

soybean shoot length
MODEL: YOUNG = CO * PROBNOEM ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
SUMMARY OF NONLINEAR REGRESSION
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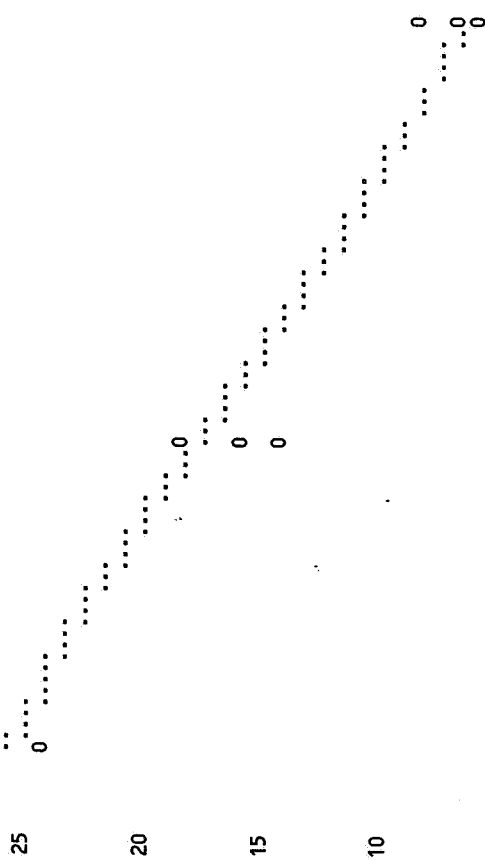
Plot of COUNT*LOG_CONC. Symbol used is 'O'.
Plot of PRED*LOG_CONC. Symbol used is 'I'.

COUNT

35

30

0



NOTE: 670 obs had missing values. 584 obs hidden.
soybean shoot length

COMPARISON OF MEANS FOR NOEL DETERMINATION
TEST IF TREATMENT IS LESS THAN CONTROL

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General Linear Models Procedure
Class Level Information

Class	Levels	Values
DOSE	4	0 0.016 0.0036 0.0068

Number of observations in data set = 24

NOTE: Due to missing values, only 12 observations can be used in this analysis.

soybean shoot length

COMPARISON OF MEANS FOR NOEL DETERMINATION
TEST IF TREATMENT IS LESS THAN CONTROL

09:18 Wednesday, February 11, 1998

General Linear Models Procedure

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	1097.080000	365.693333	79.05	0.0001
Error	8	37.006667	4.625833		
Corrected Total	11	1134.086667			

R-Square 0.967369
C.V. 10.56027
Root MSE 2.150775
RESPONSE Mean 20.36667

Source	DF	Type I SS	Mean Square	F Value	Pr > F
DOSE	3	1097.080000	365.693333	79.05	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
DOSE	3	1097.080000	365.693333	79.05	0.0001

soybean shoot length

COMPARISON OF MEANS FOR NOEL DETERMINATION
TEST IF TREATMENT IS LESS THAN CONTROL

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General Linear Models Procedure

Level of DOSE	N	Mean	SD
0	3	30.9333333	1.65630110
0.016	3	6.7333333	1.40118997
0.0036	3	27.5333333	2.98384539
0.0068	3	16.2666667	2.21208800

soybean shoot length

COMPARISON OF MEANS FOR NOEL DETERMINATION
TEST IF TREATMENT IS LESS THAN CONTROL

09:18 Wednesday, February 11, 1998

General Linear Models Procedure

Dunnett's One-tailed T tests for variable: RESPONSE

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 8 MSE= 4.625833
Critical Value of Dunnett's T= 2.416
Minimum Significant Difference= 4.2435

Comparisons significant at the 0.05 level are indicated by ****.

DOSE Comparison	Simultaneous Lower Confidence Limit		Difference Between Means	Simultaneous Upper Confidence Limit	
	Lower Limit	Upper Limit		Lower Limit	Upper Limit
0.0036 - 0	-7.644	-3.400	-3.400	0.844	***
0.0068 - 0	-18.910	-14.667	-14.667	-10.423	***
0.016 - 0	-28.444	-24.200	-24.200	-19.956	***

turnip shoot length

File: tur Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	Control	3	12.400	12.400	12.400
2	0.0018 lb ae/A	3	11.733	11.733	11.733
3	0.0036 lb ae/A	3	6.167	6.167	6.167
4	0.0068 lb ae/A	3	4.667	4.667	4.667
5	0.016 lb ae/A	3	3.367	3.367	3.367
6	0.028 lb ae/A	3	2.067	2.067	2.067

turnip shoot length

File: tur 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	12.400				
0.0018 lb ae/A	11.733	0.816		1.78	k= 1, v=12
0.0036 lb ae/A	6.167	7.630	*	1.87	k= 2, v=12
0.0068 lb ae/A	4.667	9.466	*	1.90	k= 3, v=12
0.016 lb ae/A	3.367	11.057	*	1.92	k= 4, v=12
0.028 lb ae/A	2.067	12.649	*	1.93	k= 5, v=12

s = 1.001

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

$0.0018 \text{ lb ae/A} > EC_{25}, \therefore NOEL = \text{probit } EC_5 = 0.0001 \text{ lb ae/A}$

turnip shoot length

Estimated EC Values and Confidence Limits

Point	Conc.	Lower 95% Confidence Limits	Upper Limits
EC 1.00	0.0000	0.0000	0.0001
EC 5.00	0.0001	0.0000	0.0003
EC10.00	0.0002	0.0000	0.0006
EC15.00	0.0004	0.0000	0.0009
EC50.00	0.0036	0.0018	0.0052
EC85.00	0.0367	0.0233	0.0907
EC90.00	0.0636	0.0355	0.2147
EC95.00	0.1436	0.0652	0.7808
EC99.00	0.6616	0.2007	8.9389

$EC_{25} = 0.0008 \text{ } 16ae/A$

turnip shoot length
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OBS	CONC	LOG_CONC	Y1	Y2	Y3	Y4	Y5	Y6
1	0.0000		13.0	12.8	11.4	.	.	.
2	0.0036	-2.44370	7.7	4.5	6.3	.	.	.
3	0.0068	-2.16749	5.0	4.1	4.9	.	.	.
4	0.0160	-1.79588	4.5	2.8	2.8	.	.	.
5	0.0280	-1.55284	2.2	2.5	1.5	.	.	.

turnip shoot length
MODEL: COUNT = CO * PROBNOEM ((LOG_EC50 - LOG_CONC) / SIGMA)
WEIGHTED REGRESSION

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Non-Linear Least Squares Iterative Phase

Iter	LOG_EC50	SIGMA	CO	Weighted SS
0	-2.447000	0.971000	12.400000	2.008420
1	-2.447472	0.969207	12.391189	2.017406
2	-2.447468	0.969197	12.391186	2.017407
3	-2.447468	0.969196	12.391186	2.017407

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics

Source	DF	Weighted SS	Weighted MS
Regression	3	86.000000000	28.666666667
Residual	12	2.017406994	0.168117250
Uncorrected Total	15	88.017406994	
(Corrected Total)	14	27.011404539	

Asymptotic Correlation Matrix

Corr	LOG_EC25	SIGMA	CO
LOG_EC25	1		
SIGMA	-0.931823844	1	
CO	-0.488192503	0.2467840378	1

MODEL: YOUNG = CO * PROBNOEM ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
SUMMARY OF NONLINEAR REGRESSION

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Parameter	Estimate	Asymptotic Std. Error	Asymptotic 95 % Confidence Interval Lower	Upper
LOG_EC50	-2.44746756	0.12279909077	-2.715024188	-2.179910931
SIGMA	0.96919643	0.16045771443	0.619588590	1.318804274
CO	12.39118612	0.83279273680	10.576683946	14.205688290

Asymptotic Correlation Matrix

Corr	LOG_EC50	SIGMA	CO
LOG_EC50	1		
SIGMA	-0.766799084	1	
CO	-0.645975679	0.2467840375	1

MODEL: COUNT = CO * PROBNOEM ((LOG_EC50 - LOG_CONC) / SIGMA)
SUMMARY OF NONLINEAR REGRESSION

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OBS	CONC	LOG_EC50	SIGMA	CO	RESID_SS	EC50
1	0	-2.44747	0.96920	12.3912	2.01741	.0035689

MODEL: YOUNG = CO * PROBNOEM ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
WEIGHTED REGRESSION

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Non-Linear Least Squares Iterative Phase

Iter	LOG_EC25	SIGMA	CO	Weighted SS
0	-3.087000	0.971000	12.400000	1.999027
1	-3.101234	0.969294	12.391099	2.017298

turnip shoot length
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NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics

Source	DF	Weighted SS	Weighted MS
Regression	3	86.000000000	28.666666667
Residual	12	2.017406994	0.168117250
Uncorrected Total	15	88.017406994	
(Corrected Total)	14	27.011404543	

Parameter	Estimate	Asymptotic Std. Error	Asymptotic 95 % Confidence Interval Lower	Upper
LOG_EC25	-3.10118086	0.21719701101	-3.574413191	-2.627948528
SIGMA	0.96919643	0.16045771414	0.619588590	1.318804272
CO	12.39118612	0.83279273671	10.576683944	14.205688288

Asymptotic Correlation Matrix

Corr	LOG_EC25	SIGMA	CO
LOG_EC25	1		
SIGMA	-0.931823844	1	
CO	-0.488192503	0.2467840378	1

MODEL: YOUNG = CO * PROBNOEM ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
SUMMARY OF NONLINEAR REGRESSION

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OBS	CONC	LOG_EC25	SIGMA	CO	RESID_SS	EC25
1	0	-3.10118	0.96920	12.3912	2.01741	.00079217

MODEL: YOUNG = CO * PROBNOEM ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
SUMMARY OF NONLINEAR REGRESSION

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Plot of COUNT*LOG_CONC. Symbol used is 'O'.
Plot of PRED*LOG_CONC. Symbol used is 'I'.

COUNT

14

12

10

8

0

0

NOTE: Due to missing values, only 15 observations can be used in this analysis.

turnip shoot length
COMPARISON OF MEANS FOR NOEL DETERMINATION
TEST IF TREATMENT IS LESS THAN CONTROL
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Dependent Variable: RESPONSE					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	4	194.4466667	48.6116667	50.60	0.0001
Error	10	9.6066667	0.9606667		
Corrected Total	14	204.0533333			
R-Square			Root MSE	RESPONSE Mean	
0.952921			0.980136	5.733333	

26					
Source	DF	Type I SS	Mean Square	F Value	Pr > F
MODEL	4	194.4466667	48.6116667	50.60	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F

DOSE	4	194.4466667	48.6116667	50.60	0.0001
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turnip shoot length
COMPARISON OF MEANS FOR NOEL DETERMINATION
TEST IF TREATMENT IS LESS THAN CONTROL
09:18 Wednesday, February 11, 1998

Level of DOOSE	N	Mean	SD
0	3	12.4000000	0.87177979
0.016	3	3.3666667	0.98149546
0.028	3	2.0666667	0.51316014
0.0036	3	6.1666667	1.60416126
0.0068	3	4.6666667	0.49328829

turnip shoot length

COMPARISON OF MEANS FOR NOEL DETERMINATION
TEST IF TREATMENT IS LESS THAN CONTROL

February 11, 1998
09:18 Wednesday

General Linear Models Procedure

Dunnett's One-tailed T tests for variable: RESPONSE

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 10 MSE= 0.960667
Critical Value of Dunnett's T= 2.466
Minimum Significant Difference= 1.9731

Comparisons significant at the 0.05 level are indicated by ***.

DOSE	Simultaneous		Difference Between Means	Simultaneous	
	Lower Confidence Limit	Upper Confidence Limit		Lower Confidence Limit	Upper Confidence Limit
0.0036 - 0	-8.2065	-4.2602	-6.2333	-4.2602	***
0.0068 - 0	-9.7085	-5.7602	-7.7333	-5.7602	***
0.016 - 0	-11.0065	-7.0602	-9.0333	-7.0602	***
0.028 - 0	-12.3065	-8.3062	-10.3333	-8.3062	***

corn phyto

Estimated EC Values and Confidence Limits

Point	Conc.	Lower	Upper
		95% Confidence Limits	
EC 1.00	0.0017		
EC 5.00	0.0030		
EC10.00	0.0041		
EC15.00	0.0050		
EC50.00	0.0121		
EC85.00	0.0293		
EC90.00	0.0361		
EC95.00	0.0491		
EC99.00	0.0877		

$$EC_{25} = 0.0069 \text{ lb ae/A}$$

Oat shoot length

File: oat

Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)

TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	Control	3	30.967	30.967	30.967
2	0.0068 lb ae/A	2	28.650	28.650	28.650
3	0.016 lb ae/A	3	24.700	24.700	24.700
4	0.028 lb ae/A	3	24.433	24.433	24.433
5	0.058 lb ae/A	3	19.767	19.767	19.767
6	0.11 lb ae/A	3	15.467	15.467	15.467
7	0.22 lb ae/A	3	11.667	11.667	11.667

Oat shoot length

File: oat

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	30.967				
0.0068 lb ae/A	28.650	1.804	*	1.77	k= 1, v=13
0.016 lb ae/A	24.700	5.455	*	1.86	k= 2, v=13
0.028 lb ae/A	24.433	5.687	*	1.89	k= 3, v=13
0.058 lb ae/A	19.767	9.749	*	1.90	k= 4, v=13
0.11 lb ae/A	15.467	13.491	*	1.91	k= 5, v=13
0.22 lb ae/A	11.667	16.799	*	1.92	k= 6, v=13

s = 1.407

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

$$NOEL = EC_5 = 0.004 \text{ lb ae/A}$$

oat shoot length

Estimated EC Values and Confidence Limits

Point	Conc.	Lower	Upper
		95% Confidence Limits	95% Confidence Limits
EC 1.00	0.0011	0.0004	0.0022
EC 5.00	0.0043	0.0022	0.0069
EC10.00	0.0089	0.0054	0.0128
EC15.00	0.0146	0.0097	0.0196
EC50.00	0.1153	0.0899	0.1585
EC85.00	0.9124	0.5387	1.9825
EC90.00	1.4883	0.8134	3.6452
EC95.00	3.0731	1.4943	9.0086
EC99.00	11.9716	4.6566	49.3662

$$EC_{25} = 0.030 \text{ } \mu\text{e/A}$$

oat shoot length 09:18 Wednesday, February 11, 1998						
OBS	CONC	LOG_CONC	Y1	Y2	Y3	Y4
1	0.0000	-2.16749	30.0	30.5	32.4	.
2	0.0048	-1.79588	28.8	28.5	.	.
3	0.0160	-1.79588	23.4	25.0	25.7	.
4	0.0280	-1.52884	23.8	26.9	22.6	.
5	0.0580	-1.23657	19.1	20.8	19.4	.
6	0.1100	-0.95861	17.0	14.6	14.8	.
7	0.2200	-0.65758	10.0	13.0	12.0	.

MODEL: COUNT = CO * PROBNCM ((LOG_EC50 - LOG_CONC) / SIGMA)
WEIGHTED REGRESSION

Non-Linear Least Squares Iterative Phase Dependent Variable COUNT Method: Gauss-Newton						
Iter	LOG_EC50	SIGMA	CO	Weighted SS	Weighted MS	Weighted SS
0	-0.938000	0.870000	30.970000	1.649025		
1	-0.934272	0.876806	30.871829	1.646117		
2	-0.934278	0.877017	30.873110	1.646086		
3	-0.934280	0.877023	30.873157	1.646086		
4	-0.934280	0.877023	30.873159	1.646086		

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics

Source	DF	Weighted SS	Weighted MS	Dependent Variable COUNT
Regression	3	438.30000000	146.10000000	
Residual	17	1.64608558	0.09682856	
Uncorrected Total	20	439.94608558		
(Corrected Total)	19	45.16161515		

Parameter	Estimate	Asymptotic Std. Error	Confidence Interval Lower	Confidence Interval Upper	Asymptotic 95 %
LOG_EC50	-0.93427968	0.0456749593	-1.030644863	-0.837914490	
SIGMA	0.87702284	0.07872140761	0.710936170	1.043109517	
CO	30.87315884	0.93745350600	28.895316488	32.851001198	

Asymptotic Correlation Matrix

Corr	LOG_EC50	SIGMA	CO
LOG_EC50	1		
SIGMA	-0.351654927	1	
CO	-0.792703588	0.6188924235	1

MODEL: COUNT = CO * PROBNCM ((LOG_EC50 - LOG_CONC) / SIGMA)
SUMMARY OF NONLINEAR REGRESSION
09:18 Wednesday, February 11, 1998

OBS	CONC	LOG_EC50	SIGMA	CO	RESID_SS	EC50
1	0	-0.93428	0.87702	30.8732	1.64609	0.11634

MODEL: YOUNG = CO * PROBNCM ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
WEIGHTED REGRESSION

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Non-Linear Least Squares Iterative Phase
Dependent Variable COUNT Method: Gauss-Newton

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File:A:\oat.out Page 2						
Iter	LOG_EC25	SIGMA	CO	Weighted SS	Weighted MS	Weighted SS
0	-1.522000	0.870000	30.970000	1.648251		
1	-1.525617	0.876784	30.871568	1.646088		
2	-1.525616	0.877016	30.873102	1.646086		
3	-1.525823	0.877023	30.873157	1.646086		
4	-1.525823	0.877023	30.873159	1.646086		

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics

Source	DF	Weighted SS	Dependent Variable COUNT
Regression	3	438.30000000	146.10000000
Residual	17	1.64608558	0.09682856
Uncorrected Total	20	439.94608558	
(Corrected Total)	19	45.16161515	

Parameter	Estimate	Asymptotic Std. Error	Confidence Interval Lower	Confidence Interval Upper	Asymptotic 95 %
LOG_EC25	-1.52582281	0.08130889368	-1.697368573	-1.354277054	
SIGMA	0.87702284	0.07872140756	0.710936170	1.043109516	
CO	30.87315884	0.93745350569	28.895316482	32.851001191	

Asymptotic Correlation Matrix

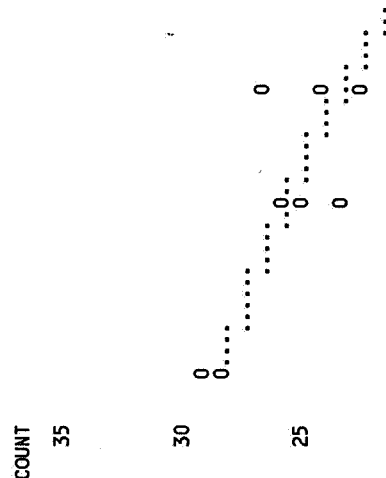
Corr	LOG_EC25	SIGMA	CO
LOG_EC25	1		
SIGMA	-0.850566597	1	
CO	-0.849450962	0.6188924237	1

MODEL: YOUNG = CO * PROBNCM ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
SUMMARY OF NONLINEAR REGRESSION
09:18 Wednesday, February 11, 1998

OBS	CONC	LOG_EC25	SIGMA	CO	RESID_SS	EC25
1	0	-1.52582	0.87702	30.8732	1.64609	0.029797

MODEL: YOUNG = CO * PROBNCM ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
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Plot of COUNT*LOG_CONC. Symbol used is 'O'.
Plot of PRED*LOG_CONC. Symbol used is 'O'.



onion shoot length

File: oni Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	Control	3	7.967	7.967	8.400
2	0.016 lb ae/a	3	8.833	8.833	8.400
3	0.028 lb ae/A	3	7.267	7.267	7.267
4	0.058 lb ae/A	3	6.567	6.567	6.567
5	0.11 lb ae/A	3	5.533	5.533	5.533
6	0.22 lb ae/A	3	4.767	4.767	4.767

onion shoot length

e: oni 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	8.400				
0.016 lb ae/a	8.400	0.871		1.78	k= 1, v=12
0.028 lb ae/A	7.267	1.406		1.87	k= 2, v=12
0.058 lb ae/A	6.567	2.813	*	1.90	k= 3, v=12
0.11 lb ae/A	5.533	4.888	*	1.92	k= 4, v=12
0.22 lb ae/A	4.767	6.429	*	1.93	k= 5, v=12

s = 0.610

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

NOEL = 0.028 lb ae/A

onion shoot length

Estimated EC Values and Confidence Limits

Point	Conc.	Lower 95% Confidence	Upper Limits
EC 1.00	0.0043	0.0008	0.0098
EC 5.00	0.0150	0.0053	0.0253
EC10.00	0.0292	0.0145	0.0426
EC15.00	0.0460	0.0281	0.0617
EC50.00	0.3109	0.2119	0.6375
EC85.00	2.1028	0.9114	11.5566
EC90.00	3.3052	1.2788	23.0846
EC95.00	6.4596	2.1093	64.4410
EC99.00	22.6991	5.3782	443.1144

$EC_{25} = 0.091 \text{ } 16 \text{ } \mu\text{e/A}$

onion shoot length
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OBS	CONC	LOG_CONC	Y1	Y2	Y3	Y4	Y5	Y6	
1	0.000	-1.55284	8.4	7.9	7.6	.	.	.	41
2	0.028	-1.23657	7.0	7.1	7.7	.	.	.	
3	0.058	-0.95861	7.2	6.6	5.9	.	.	.	
4	0.110	-0.65758	5.1	4.7	6.8	.	.	.	
5	0.220	-0.472338	4.7	4.3	5.3	.	.	.	42

MODEL: COUNT = CO * PROBNOEM ((LOG_EC50 - LOG_CONC) / SIGMA)
WEIGHTED REGRESSION

Non-Linear Least Squares Iterative Phase				
Dependent Variable COUNT				
Method: Gauss-Newton				
Iter	LOG_EC50	SIGMA	CO	Weighted SS
0	-0.509000	0.800000	7.970000	0.798000
1	-0.473853	0.858093	8.009773	0.781814
2	-0.472364	0.857062	8.004378	0.781498
3	-0.472336	0.857202	8.004546	0.781501
4	-0.472338	0.857189	8.004531	0.781501
5	-0.472338	0.857190	8.004532	0.781501
6	-0.472338	0.857190	8.004532	0.781501

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics

Source	DF	Weighted SS	Weighted MS	Dependent Variable COUNT
Regression	3	96.300000000	32.100000000	
Residual	12	0.781500634	0.065125053	
Uncorrected Total	15	97.081500634		
(Corrected Total)	14	4.008960769		

Parameter	Estimate	Asymptotic Std. Error	Confidence Interval Lower	Confidence Interval Upper	Asymptotic 95 %
LOG_EC50	-0.472337800	0.11681829729	-0.7268633799	-0.2178122203	
SIGMA	0.857190402	0.22420796565	0.3686824900	1.3456983133	
CO	8.004532366	0.40960683328	7.1120744280	8.8969903041	

Asymptotic Correlation Matrix

Corr	LOG_EC50	SIGMA	CO
LOG_EC50	1	0.5177882535	-0.291684517
SIGMA	0.5177882535	1	0.542226373
CO	-0.291684517	0.542226373	1

MODEL: COUNT = CO * PROBNOEM ((LOG_EC50 - LOG_CONC) / SIGMA)
SUMMARY OF NONLINEAR REGRESSION

OBS	CONC	LOG_EC50	SIGMA	CO	RESID_SS	EC50
1	0	-0.47234	0.85719	8.00453	0.78150	0.33703

MODEL: YOUNG = CO * PROBNOEM ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
WEIGHTED REGRESSION

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Non-Linear Least Squares Iterative Phase
Dependent Variable COUNT Method: Gauss-Newton

Iter	LOG_EC25	SIGMA	CO	Weighted SS
0	-1.020000	0.800000	7.970000	0.798000
1	-1.023000	0.858815	8.010032	0.781612
2	-1.050421	0.857019	8.004327	0.781496
3	-1.050411	0.857205	8.004550	0.781501
4	-1.050504	0.857189	8.004531	0.781501
5	-1.050504	0.857191	8.004533	0.781501
6	-1.050504	0.857190	8.004532	0.781501

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics

Source	DF	Weighted SS	Weighted MS	Dependent Variable COUNT
Regression	3	96.300000000	32.100000000	
Residual	12	0.781500634	0.065125053	
Uncorrected Total	15	97.081500634		
(Corrected Total)	14	4.008960770		

Parameter	Estimate	Asymptotic Std. Error	Confidence Interval Lower	Confidence Interval Upper	Asymptotic 95 %
LOG_EC25	-1.050504153	0.13498654023	-1.3446149918	-0.7563933140	
SIGMA	0.857190399	0.22420796503	0.3686824889	1.3456983095	
CO	8.004532363	0.40960683309	7.1120744254	8.8969903007	

Asymptotic Correlation Matrix

Corr	LOG_EC25	SIGMA	CO
LOG_EC25	1	-0.672206935	-0.859884477
SIGMA	-0.672206935	1	0.542226374
CO	-0.859884477	0.542226374	1

MODEL: YOUNG = CO * PROBNOEM ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
SUMMARY OF NONLINEAR REGRESSION

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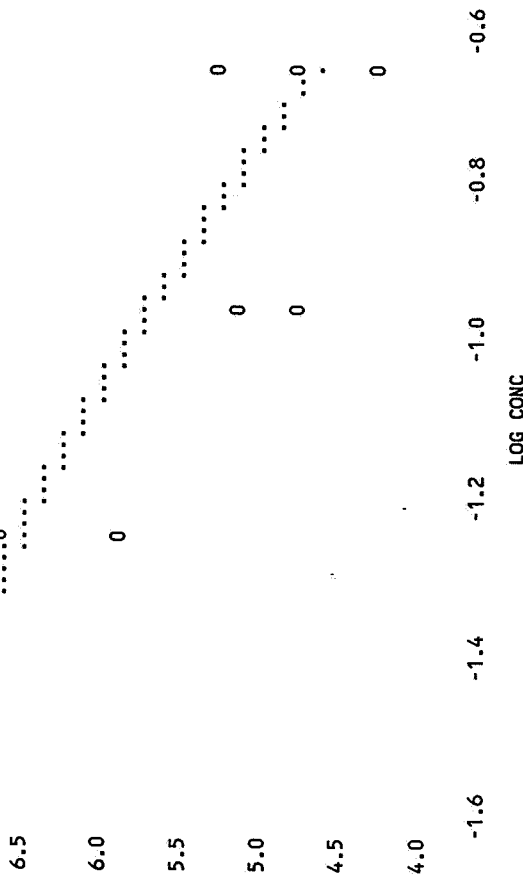
OBS	CONC	LOG_EC25	SIGMA	CO	RESID_SS	EC25
1	0	-1.05050	0.85719	8.00453	0.78150	0.089022

MODEL: YOUNG = CO * PROBNOEM ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
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Plot of COUNT*LOG_CONC. Symbol used is 'O'.
Plot of PRED*LOG_CONC. Symbol used is 'O'.

COUNT	
8.5	0
8.0	0
7.5	0
7.0	0

34



NOTE: 920 obs had missing values. 840 obs hidden.
onion shoot length
COMPARISON OF MEANS FOR NOEL DETERMINATION
TEST IF TREATMENT IS LESS THAN CONTROL
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General Linear Models Procedure

Class	Levels	Values
DOSE	5	0 0.11 0.22 0.028 0.058

Number of observations in data set = 30

NOTE: Due to missing values, only 15 observations can be used in this analysis.

onion shoot length
COMPARISON OF MEANS FOR NOEL DETERMINATION
TEST IF TREATMENT IS LESS THAN CONTROL
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General Linear Models Procedure

Dependent Variable: RESPONSE

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	4	19.95066667	4.98766667	11.20	0.0010
Error	10	4.45333333	0.44533333		
Corrected Total	14	24.40400000			
R-Square		C.V.	Root MSE	RESPONSE Mean	
0.817516	10.39460	0.667333	6.420000		

Source	DF	Type I SS	Mean Square	F Value	Pr > F
DOSE	4	19.95066667	4.98766667	11.20	0.0010
Source	DF	Type III SS	Mean Square	F Value	Pr > F
DOSE	4	19.95066667	4.98766667	11.20	0.0010

onion shoot length
COMPARISON OF MEANS FOR NOEL DETERMINATION
TEST IF TREATMENT IS LESS THAN CONTROL
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General Linear Models Procedure

Level of DOSE	N	Mean	SD
0	3	7.96666667	0.40414519
0.11	3	5.53333333	1.11504858
0.22	3	4.76666667	0.50332230
0.028	3	2.26666667	0.37859389
0.058	3	6.56666667	0.65064071

onion shoot length
COMPARISON OF MEANS FOR NOEL DETERMINATION
TEST IF TREATMENT IS LESS THAN CONTROL
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General Linear Models Procedure

Dunnett's One-tailed T tests for variable: RESPONSE

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 10 MSE= 0.445333
Critical Value of Dunnett's T= 2.466
Minimum Significant Difference= 1.5434

Comparisons significant at the 0.05 level are indicated by '***'.

DOSE Comparison	Simultaneous Lower Confidence Limit		Difference Between Means	Simultaneous Upper Confidence Limit	
	Lower Limit	Upper Limit		Lower Limit	Upper Limit
0.028 - 0	-2.0434	-0.7000	-0.7000	0.6434	***
0.058 - 0	-2.7434	-1.4000	-1.4000	-0.0566	***
0.11 - 0	-3.7768	-2.4333	-2.4333	-1.0899	***
0.22 - 0	-4.5434	-3.2000	-3.2000	-1.8566	***

RyeGRASS

shoot length

File: rye

Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	Control	3	13.333	13.333	13.333
2	0.0018 lb ae/A	3	12.933	12.933	12.933
3	0.0036 lb ae/A	3	11.467	11.467	11.467
4	0.0068 lb ae/A	3	7.900	7.900	7.900
5	0.016 lb ae/A	3	7.633	7.633	7.633
6	0.028 lb ae/A	3	6.433	6.433	6.433
7	0.058 lb ae/A	3	4.433	4.433	4.433
8	0.11 lb ae/A	3	4.200	4.200	4.200

RyeGRASS

shoot length

File: rye

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	13.333				
0.0018 lb ae/A	12.933	0.620		1.75	k= 1, v=16
0.0036 lb ae/A	11.467	2.895	*	1.83	k= 2, v=16
0.0068 lb ae/A	7.900	8.426	*	1.86	k= 3, v=16
0.016 lb ae/A	7.633	8.839	*	1.87	k= 4, v=16
0.028 lb ae/A	6.433	10.700	*	1.88	k= 5, v=16
0.058 lb ae/A	4.433	13.802	*	1.89	k= 6, v=16
0.11 lb ae/A	4.200	14.163	*	1.89	k= 7, v=16

s = 0.790

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

NOEL = 0.0018 lb ae/A

ryegrass shoot length

Estimated EC Values and Confidence Limits

Point	Conc.	Lower	Upper
		95% Confidence Limits	95% Confidence Limits
EC 1.00	0.0003	0.0001	0.0006
EC 5.00	0.0010	0.0003	0.0018
EC10.00	0.0019	0.0009	0.0032
EC15.00	0.0031	0.0016	0.0047
EC50.00	0.0232	0.0180	0.0309
EC85.00	0.1729	0.1033	0.3976
EC90.00	0.2783	0.1522	0.7466
EC95.00	0.5631	0.2691	1.9065
EC99.00	2.1123	0.7791	11.1362

$$EC_{25} = 0.0064 \text{ lb ae/A}$$

ryegrass shoot length										51
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OBS	CONC	LOG_CONC	Y1	Y2	Y3	Y4	Y5	Y6		
1	0.0000		13.20	13.4	13.40	.	.	.		
2	0.0036	-2.44370	11.20	11.4	11.80	.	.	.		
3	0.0114	-1.94310	8.15	7.5	7.65	.	.	.		
4	0.0280	-1.55284	5.10	6.6	7.60	.	.	.		
5	0.0580	-1.23657	4.90	4.2	4.20	.	.	.		
ryegrass shoot length										52
MODEL: COUNT = C0 * PROB NORM ((LOG_EC50 - LOG_CONC) / SIGMA)										
WEIGHTED REGRESSION										

MODEL: COUNT = CO * PROBLOG ((LOG_EC50 - LOG_CONC) / SIGMA)
WEIGHTED REGRESSION

ryegrass shoot length
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Non-Linear Least Squares Iterative Phase						
Iter	Dependent Variable	COUNT	SIGMA	CO	Method: Gauss-Newton	Weighted SS
0	-1.634000	0.840000	13.330000			0.970254
1	-1.646274	0.916235	13.487380			0.922650
2	-1.643918	0.912889	13.463805			0.922377
3	-1.644062	0.913254	13.464982			0.922401
4	-1.644048	0.913218	13.464864			0.922398
5	-1.644049	0.913222	13.464876			0.922399
6	-1.644049	0.913221	13.464875			0.922399
7	-1.644049	0.913221	13.464875			0.922399

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics

Source	DF	Weighted SS	Weighted MS
Regression	3	130.30000000	43.43333333
Residual	12	0.92239861	0.07686655
Uncorrected Total	15	131.22239861	
(Corrected Total)	14	19.50722647	

Parameter	Estimate	Asymptotic Std. Error	Confidence Interval Lower	Confidence Interval Upper	Asymptotic 95 %
LOG_EC50	-1.64404879	0.06750936379	-1.791139279	-1.496958310	
SIGMA	0.91322126	0.10947957212	0.674685416	1.151757112	
CO	13.46487492	0.57868831992	12.204019523	14.725730309	

Asymptotic Correlation Matrix

Corr	LOG_EC50	SIGMA	CO
LOG_EC50	1		
SIGMA	-0.465513994	1	
CO	-0.8157288	0.4888704602	1

MODEL: COUNT = CO * PROBLOG ((LOG_EC50 - LOG_CONC) / SIGMA)
WEIGHTED REGRESSION
ryegrass shoot length
09:18 Wednesday, February 11, 1998

OBS	CONC	LOG_EC50	SIGMA	CO	RESID_SS	EC50
1	0	-1.64405	0.91322	13.4649	0.92240	0.022696

MODEL: YOUNG = CO * PROBLOG ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
WEIGHTED REGRESSION
ryegrass shoot length
09:18 Wednesday, February 11, 1998

Non-Linear Least Squares Iterative Phase

Dependent Variable COUNT				Method: Gauss-Newton	
Iter	LOG EC25	SIGMA	CO	Weighted SS	Weighted SS
0	-2.193000	0.840000	13.330000	0.961443	0.961443
1	-2.264236	0.916784	13.487837	0.922331	0.922331
2	-2.259613	0.912851	13.463690	0.923575	0.923575
3	-2.260047	0.913258	13.464994	0.923401	0.923401
4	-2.260004	0.913218	13.464863	0.922398	0.922398
5	-2.260008	0.913222	13.464876	0.922399	0.922399
6	-2.260007	0.913221	13.464875	0.922399	0.922399
7	-2.260007	0.913221	13.464875	0.922399	0.922399

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics

Source	DF	Weighted SS	Weighted MS
Regression	3	130.30000000	43.43333333
Residual	12	0.92239861	0.07686655
Uncorrected Total	15	131.22239861	
(Corrected Total)	14	19.50722646	

Parameter	Estimate	Asymptotic Std. Error	Confidence Interval Lower	Confidence Interval Upper	Asymptotic 95 %
LOG_EC25	-2.26000741	0.12104354119	-2.523739015	-1.996275797	
SIGMA	0.91322126	0.10947957217	0.674685417	1.151757112	
CO	13.46487492	0.57868831997	12.204019524	14.725730310	

Asymptotic Correlation Matrix

Corr	LOG_EC25	SIGMA	CO
LOG_EC25	1		
SIGMA	-0.86968234	1	
CO	-0.753191228	0.4888704601	1

MODEL: YOUNG = CO * PROBLOG ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
SUMMARY OF NONLINEAR REGRESSION
ryegrass shoot length
09:18 Wednesday, February 11, 1998

OBS	CONC	LOG_EC25	SIGMA	CO	RESID_SS	EC25
1	0	-2.26001	0.91322	13.4649	0.92240	0.054953

MODEL: YOUNG = CO * PROBLOG ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
SUMMARY OF NONLINEAR REGRESSION
ryegrass shoot length
09:18 Wednesday, February 11, 1998

Plot of COUNT*LOG_CONC. Symbol used is 'O'.
Plot of PRED*LOG_CONC. Symbol used is 'O'.

COUNT

14

12

10

38

Table 58. Summary of EC_{25} , EC_{50} , r^2 and NOEC values (expressed as measured concentrations in lb A.E./A) determined during emergence tests exposing ten plant species to SAN 836H.

Species	NOEC ^a (lb A.E./A)	EC_{25}^b (lb A.E./A)	EC_{50}^b (lb A.E./A)	r^{2b}	Regression Equation ^c
Cabbage					
Percent emergence	0.058	> 0.058	> 0.058	NA ^d	NA
Shoot length	0.0036	0.0072	0.022	0.94	response vs. log concentration
Lower 95% CL ^e		0.0035	0.011		
Upper 95% CL		0.015	0.045		
Corn					
Percent emergence	0.22	> 0.22	> 0.22	NA	NA
Shoot length	0.028	0.17	3.6	0.70	response vs. log concentration
Lower 95% CL		0.038	0.62		
Upper 95% CL		1.1	93		
Cucumber					
Percent emergence	0.058	> 0.058	> 0.058	NA	NA
Shoot length	0.0018	0.0038	0.020	0.77	response vs. log concentration
Lower 95% CL		0.00072	0.0044		
Upper 95% CL		0.017	0.10		
Lettuce					
Percent emergence	0.0068	0.0044	0.023	0.55	response vs. log concentration
Lower 95% CL		0.00026	0.0019		
Upper 95% CL		0.068	0.66		
Shoot length	0.00034 ^f	0.0014	0.0078	0.79	response vs. log concentration
Lower 95% CL		0.00027	0.0018		
Upper 95% CL		0.0057	0.035		
Oat					
Percent emergence	0.22	> 0.22	> 0.22	NA	NA
Shoot length	0.0068	0.032	0.12	0.95	probit response vs. log concentration
Lower 95% CL		0.016	0.063		
Upper 95% CL		0.060	0.23		

Table 58. Continued. Summary of EC_{25} , EC_{50} , r^2 and NOEC values (expressed as measured concentrations in lb A.E./A) determined during emergence tests exposing ten plant species to SAN 836H.

Species	NOEC ^a (lb A.E./A)	EC_{25} ^b (lb A.E./A)	EC_{50} ^b (lb A.E./A)	r^2 ^b	Regression Equation ^c
Onion					
Percent emergence	0.11	0.12	0.62	0.50	response vs.
Lower 95% CL		0.010	0.065		log concentration
Upper 95% CL		3.5	85		
Shoot length	0.058	0.086	0.33	0.86	response vs.
Lower 95% CL		0.034	0.13		log concentration
Upper 95% CL		0.22	1.0		
Perennial Ryegrass					
Percent emergence	0.11	> 0.11	> 0.11	NA	NA
Shoot length	0.0018	0.0052	0.025	0.89	response vs.
Lower 95% CL		0.0017	0.0085		log concentration
Upper 95% CL		0.015	0.074		
Soybean					
Percent emergence	0.016	> 0.016	> 0.016	NA	NA
Shoot length	0.0036	0.0050	0.0096	0.92	response vs.
Lower 95% CL		0.0012	0.0059		concentration
Upper 95% CL		0.0087	0.014		

Table 58. Continued. Summary of EC_{25} , EC_{50} , r^2 and NOEC values (expressed as measured concentrations in lb A.E./A) determined during emergence tests exposing ten plant species to SAN 836H.

Species	NOEC ^a (lb A.E./A)	EC_{25} ^b (lb A.E./A)	EC_{50} ^b (lb A.E./A)	r^2 ^b	Regression Equation ^c
Tomato					
Percent emergence	0.22	> 0.22	> 0.22	NA	NA
Shoot length	0.028	0.10	0.20	0.77	probit response vs. log concentration
Lower 95% CL		0.028	0.056		
Upper 95% CL		0.40	0.91		
Turnip					
Percent emergence	0.016	0.026	0.29	0.37	response vs. log concentration
Lower 95% CL		0.00072	0.013		
Upper 95% CL		49	73		
Shoot length	0.0018	0.0022	0.0060	0.80	response vs. log concentration
Lower 95% CL		0.00057	0.0017		
Upper 95% CL		0.0072	0.020		

^a NOEC = No-Observed-Effect Concentration

^b The results for all application rates for each parameter were used to calculate the EC_{25} , EC_{50} and r^2 values.

^c The type of regression equation used to calculate the EC_{25} , EC_{50} and r^2 values

^d NA = Not Applicable

^e CL = Confidence Limit

^f The NOEC was established by Dunnett's Test to be < 0.0009 lb A.E./A, the lowest application rate tested. Therefore, the EC_{05} of 0.00034 lb A.E./A was calculated to substitute as the NOEC value.