3-2-99

MRID No. 443074-21

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

005107 ~~005108~~ EG 3/99

1. **CHEMICAL:** SAN 836H PC Code No.: ~~Not reported~~

2. **TEST MATERIAL:** SAN 836H ~~acid~~ Kraliger 3/2/99 Purity: 86.5%

3. **CITATION:**

Author:	J.R. Hoberg
Title:	SAN 836H - Determination of Effects on Seed Germination, Seedling Emergence and Vegetative Vigor of Ten Plant Species
Study Completion Date:	August 17, 1995
Laboratory:	Springborn Laboratories, Inc., Wareham, MA
Sponsor:	Sandoz Agro, Inc., Des Plaines, IL
Laboratory Report ID:	95-4-5821
MRID No.:	443074-21
DP Barcode:	Not reported

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

Signature: [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: [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
EC_{25}: 0.0052 lb ae/A
NOEL: 0.0018 lb ae/A

20 total

Most sensitive dicot: Turnip
Most sensitive parameter: Phytotoxicity
EC_{25}: 0.0043 lb ae/A
NOEL: 0.0030 lb ae/A

8. **ADEQUACY OF THE STUDY:**

A. Classification: Core for a formulated product.

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.	Dicots: cabbage, cucumber, lettuce, soybean, tomato, turnip Monocots: 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	Between 1x and 4x, usually 2x
Doses At least 5	5 or 6 - rates ranging from 0.0004 to 0.41 lb of acid equivalents (ae)/A
Controls Negative and solvent	Negative (deionized water) 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	0.25 lb ae/A dicamba and 0.10 lb ae/A SAN 836H (0.35 lb ae/A total)

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 83 to 100% 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	emergence	0.074	0.092
Cucumber	shoot length	0.059	0.025
Lettuce	"	0.0092	0.0061
Soybean	"	0.011	0.012
Tomato	"	0.015	0.012
Turnip	"	0.047	0.024
Corn	"	0.076	0.024
Oat	"	0.17	0.092
Onion	"	0.070	0.046
Ryegrass	"	0.053	0.046

*Determination of the most sensitive parameter is based on EC_{25} values.

Observations: Symptoms of test material toxicity included chlorosis, necrosis, leaf curl, split stem, and plant death.

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
EC_{25} 95% C.L.: 0.0071 - 0.012 lb ae/A Probit Slope: N/A

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Most sensitive monocot: ryegrass Parameter: shoot length
EC_{25} 95% C.L.: 0.020 - 0.14 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 EC_{25} 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	phytotoxicity	0.021*	0.008**
Cucumber	"	0.0076*	0.0016**
Lettuce	shoot length	0.0098	0.0049***
Soybean	phytotoxicity	0.0044	0.0032**
Tomato	shoot length	0.016	0.006
Turnip	phytotoxicity	0.0043*	0.0030**
Corn	shoot length	0.082*	0.024
Oat	"	0.155	0.046
Onion	"	0.070	0.046
Ryegrass	"	0.051	0.024

*Linear interpolation.
**Visual interpretation.
***The EC_5 value from the probit analysis.

Results for most sensitive parameter of most sensitive species

	Monocot	Dicot
Species	ryegrass	turnip
Parameter	shoot length	phytotoxicity
EC_{25} (lb ae/A)	0.051	0.0043
95% C.I. (lb ae/A)	0.023 - 0.112	could not be determined
Probit Slope	N/A	N/A
NOEL (lb ae/A)	0.024	0.0030

14. **REVIEWER'S COMMENTS:** The maximum label rate was reported as 0.35 lb ae/A (0.25 lb ae/A dicamba and 0.10 lb ae/A SAN 836H). Since the test material was 71% ae, the maximum test rate for this study should have been 0.49 lb ae/A, rather than 0.41 lb ae/A. However, an EC_{25} and NOEL were determined for each species. Consequently, this study is scientifically sound and fulfills the guideline requirements. The study is classified as **Core for a formulated product.**

lettuce shoot length
File: let Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	Control	3	8.067	8.067	8.067
2	0.0032 lb ae/A	3	6.733	6.733	7.083
3	0.0061 lb ae/A	3	7.433	7.433	7.083
4	0.012 lb ae/A	3	5.400	5.400	5.400
5	0.024 lb ae/A	3	2.500	2.500	2.500
6	0.046 lb ae/A	3	0.800	0.800	0.800

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	8.067				
0.0032 lb ae/A	7.083	2.539	*	1.78	k= 1, v=12
0.0061 lb ae/A	7.083	2.539	*	1.87	k= 2, v=12
0.012 lb ae/A	5.400	6.885	*	1.90	k= 3, v=12
0.024 lb ae/A	2.500	14.373	*	1.92	k= 4, v=12
0.046 lb ae/A	0.800	18.762	*	1.93	k= 5, v=12

s = 0.474
Note: df used for table values are approximate when v > 20.

NOEL = probit EC_5 = 0.0049 lb ae/A

lettuce shoot length

Estimated EC Values and Confidence Limits

Point	Conc.	Lower 95% Confidence Limits	Upper 95% Confidence Limits
EC 1.00	0.0030	0.0020	0.0039
EC 5.00	0.0049	0.0038	0.0060
EC10.00	0.0065	0.0052	0.0077
EC15.00	0.0078	0.0064	0.0090
EC50.00	0.0169	0.0152	0.0189
EC85.00	0.0369	0.0317	0.0448
EC90.00	0.0443	0.0374	0.0555
EC95.00	0.0582	0.0476	0.0764
EC99.00	0.0971	0.0744	0.1399

$EC_{25} = 0.0103$ 16 ae/A