



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

1-27-98

MEMORANDUM

SUBJECT: Isoxaflutole: Review of Phytotoxicity Studies for New Chemical Registration, DP Barcode D240106

FROM: Michael Davy, Agronomist
Environmental Risk Branch II
Environmental Fate and Effects Branch (7505C) *Michael Davy*

Thru: Elizabeth M. Leovey, Chief *E. Leovey for 1/27/98*
Environmental Risk Branch II
Environmental Fate and Effects Branch (7505C)

TO: Joanne Miller, PM-23
Registration Division (H7506)

ERB II has reviewed six studies submitted by Rhone-Poulenc Ag Co., Research Triangle, NC. These studies were submitted under DP Barcode D240106 for section 3 registration of Isoxaflutole.

Review of Submitted Studies

The following is a brief summary of the submitted studies:

•CITATION:

Author: D. Teixeira
Title: RPA 201772 - Determination of Effects on Vegetative Vigor of Three Plant Species
Study Completion Date: September 17, 1997
Laboratory: Springborn Laboratories, Inc., Wareham, MA
Sponsor: Rhone-Poulenc Ag Company, Research Triangle Park, NC
Laboratory Report ID: 97-9-7076
MRID No.: 443999-05

This study is scientifically sound and fulfills the guideline requirement for a tier II vegetative vigor study with terrestrial plants.

Results Synopsis

Most sensitive monocot: Ryegrass; Most sensitive parameter: Root weight
EC₂₅: 0.0086 lb. ai/A NOEL: 0.0076 lb. ai/A

Most sensitive dicot: Lettuce; Most sensitive parameter: Root weight
EC₂₅: 0.00006 lb. ai/A NOEL: 0.00004 lb. ai/A

•CITATION:

Author: D. Teixeira
Title: RPA 203328 - Determination of Effects on Vegetative Vigor of Ten Plant Species
Study Completion Date: September 19, 1997
Laboratory: Springborn Laboratories, Inc., Wareham, MA
Sponsor: Rhone-Poulenc Ag Company, Research Triangle Park, NC
Laboratory Report ID: 97-9-7082
MRID No.: 443999-06

This study is scientifically sound and fulfills the guideline requirements for a Tier I vegetative vigor study with terrestrial plants. None of the parameters measured were affected by 25% or more for all ten test species when treated at the maximum label rate of 0.14 lb. ai/A (0.13 lb. ai/A measured rate).

•CITATION:

Author: D. Teixeira
Title: RPA 203328 - Determination of Effects on Seedling Emergence of Ten Plant Species
Study Completion Date: September 18, 1997
Laboratory: Springborn Laboratories, Inc., Wareham, MA
Sponsor: Rhone-Poulenc Ag Company, Research Triangle Park, NC
Laboratory Report ID: 97-9-7068
MRID No.: 443999-07
DP Barcode: D240106

This study is scientifically sound and fulfills the guideline requirements for a Tier I seedling emergence study with terrestrial plants. None of the parameters measured were affected by 25% or more for all ten test species when treated at the maximum label rate of 0.14 lb. ai/A.

● **CITATION:**

Author: J.R. Hoberg
Title: RPA 202248 Technical - Toxicity to the Freshwater Green Alga, *Selenastrum capricornutum*
Study Completion Date: September 17, 1997
Laboratory: Springborn Laboratories, Inc., Wareham, MA
Sponsor: Rhone-Poulenc Ag Company, Research Triangle Park, NC
Laboratory Report ID: 97-9-7073
MRID No.: 443999-08

This study is scientifically sound and fulfills the guideline requirements for an algal toxicity test.

Results Synopsis: EC₅₀: 5.0 ppm ai (95% C.I.: 4.6 - 5.4 ppm ai)
NOEC: 0.08 ppm ai Probit Slope: N/A

● **CITATION:**

Author: J.R. Hoberg
Title: RPA 202248 Technical - Toxicity to Duckweed, *Lemna gibba*
Study Completion Date: September 16, 1997
Laboratory: Springborn Laboratories, Inc., Wareham, MA
Sponsor: Rhone-Poulenc Ag Company, Research Triangle Park, NC
Laboratory Report ID: 97-9-7066
MRID No.: 443999-09

This study is scientifically sound and fulfills the guideline requirements for an aquatic plant toxicity test.

Results Synopsis: EC₅₀: 0.075 ppm ai (95% C.I.: 0.065 - 0.088 ppm ai)
Probit Slope: N/A NOEC: 0.009 ppm ai

● **CITATION:**

Author: J.R. Hoberg
Title: RPA 203328 Technical - Toxicity to Duckweed, *Lemna gibba*
Study Completion Date: September 17, 1997
Laboratory: Springborn Laboratories, Inc., Wareham, MA
Sponsor: Rhone-Poulenc Ag Company, Research Triangle Park, NC
Laboratory Report ID: 97-9-7067
MRID No.: 443999-10

This study is scientifically sound and fulfills the guideline requirements for an aquatic plant toxicity test. RPA 203328 did not adversely affect the growth of *L. gibba* by 25% or more at a concentration of 9.8 ppm ai (equivalent to ten times the maximum application rate).

Non-Target Plant Risk Discussion

The data from the above studies show that the terminal degradate, RPA 203328, is not phytotoxic. **However, this does not change EFED's conclusion about the phytotoxicity of isoxaflutole and its primary degradate, RPA 202248, of 22 ppt in water.** EFED continues to have concerns that irrigation water from surface or ground water containing 22 ppt or higher may adversely affect non-target plants. RPA 202248 is persistent and potentially mobile in the laboratory and in the field. **EFED predicts that RPA 202248 will persist and accumulate in surface water and shallow ground water resources surrounding treated areas.** GENEEC and PRZM-EXAMS modeling support this conclusion. For RPA 202248, the 56-day EEC from GENEEC is 6100 ppt and the one-in-ten year EEC from PRZM-EXAMS is 2400 ppt. **These predicted concentrations exceed RPA 202248's phytotoxic level of concern (22 ppt) by several hundreds of times for non-target terrestrial plants including crops.**

If you have any questions, please do not hesitate to contact Mike Davy at 305-7081.

**DATA EVALUATION RECORD
VEGETATIVE VIGOR TEST
§ 123-1 (TIER II)**

1. **CHEMICAL:** Isoxaflutole **PC Code No.:** 123000

2. **TEST MATERIAL:** RPA 201772 technical **Purity:** 96.3%

3. **CITATION:**

Author: D. Teixeira
Title: RPA 201772 - Determination of Effects on Vegetative Vigor of Three Plant Species
Study Completion Date: September 17, 1997
Laboratory: Springborn Laboratories, Inc., Wareham, MA
Sponsor: Rhone-Poulenc Ag Company, Research Triangle Park, NC
Laboratory Report ID: 97-9-7076
MRID No.: 443999-05
DP Barcode: D240106

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

Signature:  **Date:** 1/12/98

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

Signature: P. Kosalwat **Date:** 1/12/98

5. **APPROVED BY:**

Signature:  **Date:** 1/21/98

6. **STUDY PARAMETERS:**

Definitive Study Duration: 14 days

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

Results Synopsis:

Most sensitive monocot: Ryegrass
 Most sensitive parameter: Root weight
 EC₂₅: 0.0086 lb ai/A
 NOEL: 0.0076 lb ai/A

Most sensitive dicot: Lettuce
 Most sensitive parameter: Root weight
 EC₂₅: 0.00006 lb ai/A
 NOEL: 0.00004 lb ai/A

8. ADEQUACY OF THE STUDY:

A. Classification: When this core data are added to core data for the other seven required species, the entire study can be placed in the core category.

B. Rationale: N/A.

C. Repairability: N/A.

9. GUIDELINE DEVIATIONS: No guideline deviations 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> : lettuce, turnip <u>Monocots</u> : ryegrass
Number of plants per rep 5	5
Source of Seed	Untreated seed obtained from various commercial suppliers

B. Test System

Guideline Criteria	Reported Information
Solvent	10% acetone solution
Site of test	Growth chamber

Guideline Criteria	Reported Information
Planting method / type of pot	Three- to four-day-old seedlings planted into polypropylene pots (13-cm top diameter) and allowed to grow for 7 days
Method of application	Belt sprayer
Method of watering	Subirrigation
Growth stage at application 1-3 true leaf stage.	1-3 true leaf stage

C. Test Design

Guideline Criteria	Reported Information
Dose range 2x or 3x	Either 2x or 4x
Doses At least 5	5 or 6 - rates ranging from 0.00001 to 0.025 lb of active ingredient (ai)/A
Controls Negative and solvent	Negative and solvent (10% acetone) control groups
Replicates per dose At least 3	3
Duration of test 14 days	14 days
Were observations made at least weekly?	Observations made on days 7 and 14
Maximum labeled rate	0.18 lb ai/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 98 to 120% 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 ai/A)	NOEL (lb ai/A)
Lettuce	root weight	0.000056	0.000035
Turnip	root weight	0.00010	0.000035
Ryegrass	root weight	0.0086	0.0076

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

Observations: Symptoms of test material toxicity included chlorosis and necrosis.

Statistical Method: Analyses were based on measured application rates with comparison to the pooled control data. Bonferroni'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: root weight
EC₂₅ 95% C.L.: 0.0000026 - 0.00091 lb ai/A

Most sensitive monocot: ryegrass Parameter: root weight
EC₂₅ 95% C.L.: 0.0006 - 0.034 lb ai/A

- 13. VERIFICATION OF STATISTICAL RESULTS:** Williams' test was used for mean separation. Probit analysis 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 ai/A)	NOEL (lb ai/A)
Lettuce	root weight	0.00007	0.00001*
Turnip	root weight	0.00046	0.00010*
Ryegrass	root weight	0.0095	0.0042*

*The probit EC₅ result.

Results for most sensitive parameter of most sensitive species

	Monocot	Dicot
Species	ryegrass	lettuce
Parameter	root weight	root weight
EC ₂₅ (lb ai/A)	0.0086	0.00006
95% C.I. (lb ai/A)	0.0006 - 0.0340	0.000003 - 0.00091
Probit Slope	N/A	N/A
NOEL (lb ai/A)	0.0076	0.00004

14. **REVIEWER'S COMMENTS:** Each pot of plants received 9.4 mL of spray solution. This volume translates to a field rate of 966 gallons per acre. This is an unusually large volume of diluent. Future studies should try to apply treatment solutions near the intended diluent volume.

This study is scientifically sound and fulfills the guideline requirements when added to the core data from the other seven required test species. The study is classified as **Core**.

lettuce root weight

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WILLIAMS TEST (Isotonic regression model)

TABLE 1 OF 2

GROUP	IDENTIFICATION ($1/b a_i/A$)	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	Sol. Con.	3	0.031	0.031	0.033
2	0.000011	3	0.036	0.036	0.033
3	0.000035	3	0.027	0.027	0.027
4	0.00014	3	0.019	0.019	0.019
5	0.00054	3	0.010	0.010	0.010
6	0.0022	3	0.004	0.004	0.004

lettuce root weight

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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
Sol. Con.	0.033				
0.000011	0.033	0.306		1.78	k= 1, v=12
0.000035	0.027	0.529		1.87	k= 2, v=12
0.00014	0.019	1.549		1.90	k= 3, v=12
0.00054	0.010	2.664	*	1.92	k= 4, v=12
0.0022	0.004	3.451	*	1.93	k= 5, v=12

s = 0.009

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

$$0.00014 > EC_{25}, \therefore$$

$$NOEL = 1.2 \times 10^{-5} \text{ lb ai/A (prob. } EC_5)$$

lettuce root weight

Estimated EC Values and Confidence Limits

Point	Conc.	Lower	Upper
		95% Confidence Limits	Limits
EC 1.00	0.3466	0.1271	0.7031
EC 5.00	1.2170	0.5808	2.0660
EC10.00	2.3774	1.2989	3.6904
EC15.00	3.7356	2.2269	5.4814
EC50.00	25.2304	19.4298	32.6555
EC85.00	170.4065	117.4563	280.7902
EC90.00	267.7632	174.6234	480.9517
EC95.00	523.0533	312.1872	1074.6261
EC99.00	1836.3567	918.0020	4908.3374

$$EC_{25} = 7.32 \times 10^{-5}$$

Lettuce root weight						
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OBS	CONC	LOG_CONC	Y1	Y2	Y3	Y4 Y5 Y6
1	0.0		0.0346	0.0155	0.0423	
2	3.5	0.54407	0.0369	0.0141	0.0291	
3	14.0	1.14613	0.0247	0.0156	0.0161	
4	54.0	1.73239	0.0063	0.0221	0.0021	
5	220.0	2.34242	0.0059	0.0049	0.0014	

MODEL: COUNT = CO * PROBLOG (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	
0	1.402000	0.800000	0.030800	0.049697		
1	1.377216	0.842231	0.031124	0.049465		
2	1.378730	0.840679	0.031096	0.049473		
3	1.378641	0.840778	0.031097	0.049473		
4	1.378646	0.840772	0.031097	0.049473		

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics				
Source	DF	Weighted SS	Dependent Variable COUNT	Weighted MS
Regression	3	0.2716000000	0.0905333333	
Residual	12	0.04947295593	0.00412274633	
Uncorrected Total	15	0.32107295593		
(Corrected Total)	14	0.16195428824		

Parameter	Estimate	Asymptotic Std. Error	Confidence Interval Lower	Upper
LOG_EC50	1.378646371	0.3296189132	0.66047180155	2.0968209407
SIGMA	0.840771814	0.31562997642	0.15307215881	1.5284714689
CO	0.031097199	0.00622556981	0.01753282775	0.0446615705

Asymptotic Correlation Matrix

Corr	LOG_EC50	SIGMA	CO
LOG_EC50	1		
SIGMA	-0.693608416	1	
CO	-0.787953123	0.5323074719	1

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

OBS	CONC	LOG_EC50	SIGMA	CO	RESID_SS	EC50
1	0	1.37865	0.84077	0.031097	0.049473	23.9137

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

Non-Linear Least Squares Iterative Phase				
Dependent Variable COUNT Method: Gauss-Newton				
Iter	LOG_EC25	SIGMA	CO	Weighted SS
0	0.865000	0.800000	0.030800	0.049591

1	0.809154	0.842274	0.031124	0.049463
2	0.811702	0.840678	0.031096	0.049473
3	0.811544	0.840778	0.031097	0.049473
4	0.811554	0.840772	0.031097	0.049473

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics				
Source	DF	Weighted SS	Dependent Variable COUNT	Weighted MS
Regression	3	0.2716000000	0.0905333333	
Residual	12	0.04947295593	0.00412274633	
Uncorrected Total	15	0.32107295593		
(Corrected Total)	14	0.16195428841		

Parameter	Estimate	Asymptotic Std. Error	Confidence Interval Lower	Upper
LOG_EC25	0.8115541980	0.50131104928	-0.28071035674	1.9038187527
SIGMA	0.8407718090	0.31562997507	0.15307215693	1.5284714611
CO	0.0310971991	0.00622556980	0.01753282772	0.0446615704

Asymptotic Correlation Matrix

Corr	LOG_EC25	SIGMA	CO
LOG_EC25	1		
SIGMA	-0.88071929	1	
CO	-0.7441392	0.5323074734	1

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

OBS	CONC	LOG_EC25	SIGMA	CO	RESID_SS	EC25
1	0	0.81155	0.84077	0.031097	0.049473	6.47969

MODEL: YOUNG = CO * PROBLOG (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 'I'.

COUNT						
0.045						
0.040						
0.035						
0.030						
0.025						

turnip root weight

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WILLIAMS TEST (Isotonic regression model)

TABLE 1 OF 2

GROUP	IDENTIFICATION (lb ai/A)	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	Sol. Con.	3	0.108	0.108	0.111
2	0.000011	3	0.114	0.114	0.111
3	0.000035	3	0.093	0.093	0.093
4	0.00014	3	0.082	0.082	0.083
5	0.00054	3	0.084	0.084	0.083
6	0.0022	3	0.026	0.026	0.026
7	0.0076	3	0.019	0.019	0.019

turnip root weight

F = 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
Sol. Con.	0.111				
0.000011	0.111	0.221		1.76	k= 1, v=14
0.000035	0.093	1.071		1.85	k= 2, v=14
0.00014	0.083	1.843		1.88	k= 3, v=14
0.00054	0.083	1.843		1.89	k= 4, v=14
0.0022	0.026	6.034	*	1.90	k= 5, v=14
0.0076	0.019	6.514	*	1.91	k= 6, v=14

s = 0.017

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

$$0.00054 > EC_{25}, \therefore$$

$$NOEL = 0.00010 \text{ lb ai/A (prob.} \leq EC_5)$$

turnip root weight

Estimated EC Values and Confidence Limits

Point	Conc.	Lower 95% Confidence Limits	Upper Limits
EC 1.00	0.3603		
EC 5.00	1.0265		
EC10.00	1.7937		
EC15.00	2.6144		
EC50.00	12.8508		
EC85.00	63.1665		
EC90.00	92.0664		
EC95.00	160.8866		
EC99.00	458.3497		

$$EC_{75} = 4.57 \times 10^{-4} \text{ } \mu\text{Si}/\text{A} = 0.00046 \text{ } \mu\text{Si}/\text{A}$$

ryegrass root weight

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WILLIAMS TEST (Isotonic regression model)

TABLE 1 OF 2

GROUP	IDENTIFICATION (lb ai/A)	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	Sol. Con.	3	0.055	0.055	0.065
2	0.00095	3	0.074	0.074	0.065
3	0.0022	3	0.066	0.066	0.065
4	0.0043	3	0.044	0.044	0.044
5	0.0076	3	0.044	0.044	0.044
6	0.014	3	0.031	0.031	0.031
7	0.026	3	0.012	0.012	0.012

ryegrass root weight

F =: 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
Sol. Con.	0.065				
0.00095	0.065	0.571		1.76	k= 1, v=14
0.0022	0.065	0.571		1.85	k= 2, v=14
0.0043	0.044	0.630		1.88	k= 3, v=14
0.0076	0.044	0.630		1.89	k= 4, v=14
0.014	0.031	1.323		1.90	k= 5, v=14
0.026	0.012	2.396	*	1.91	k= 6, v=14

s = 0.022

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

$$0.014 > F_{0.05, 1, 14}$$

$$NOEL = 0.0042 \text{ lb ai/A (prob. } F_{0.05})$$

ryegrass root weight

Estimated EC Values and Confidence Limits

Point	Conc.	Lower 95% Confidence	Upper Limits
EC 1.00	0.0024	0.0013	0.0035
EC 5.00	0.0042	0.0027	0.0054
EC10.00	0.0055	0.0039	0.0068
EC15.00	0.0067	0.0050	0.0080
EC50.00	0.0149	0.0132	0.0169
EC85.00	0.0334	0.0273	0.0455
EC90.00	0.0404	0.0320	0.0583
EC95.00	0.0536	0.0404	0.0844
EC99.00	0.0910	0.0621	0.1696

$$EC_{25} = 0.0088 \text{ lb a.i./A}$$

		ryegrass root weight				12:17 Thursday, January 8, 1998				11
OBS	CONC	LOG_CONC	Y1	Y2	Y3	Y4	Y5	Y6		
1	0.0000		0.0639	0.0588	0.0424	.	.	.	.	
2	0.0076	-2.11919	0.0228	0.0420	0.0670	.	.	.	.	
3	0.0140	-1.85387	0.0378	0.0279	0.0284	.	.	.	.	
4	0.0260	-1.58503	0.0149	0.0138	0.0078	.	.	.	.	

ryegrass root weight
 MODEL: COUNT = CO * PROBNOIR ((LOG_EC50 - LOG_CONC) / SIGMA)
 WEIGHTED REGRESSION

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		Non-Linear Least Squares Iterative Phase				Dependent Variable COUNT				Method: Gauss-Newton				Weighted SS			
Iter	Log EC50	SIGMA	CO	Weighted SS	CO	Weighted SS	CO	Weighted SS	CO	Weighted SS	CO	Weighted SS	CO	Weighted SS	CO	Weighted SS	CO
0	-1.827000	0.338000	0.055000	0.031758	0.055000	0.031758	0.055000	0.031758	0.055000	0.031758	0.055000	0.031758	0.055000	0.031758	0.055000	0.031758	0.055000
1	-1.814283	0.311008	0.054469	0.031013	0.054469	0.031013	0.054469	0.031013	0.054469	0.031013	0.054469	0.031013	0.054469	0.031013	0.054469	0.031013	0.054469
2	-1.813239	0.309568	0.054364	0.031015	0.054364	0.031015	0.054364	0.031015	0.054364	0.031015	0.054364	0.031015	0.054364	0.031015	0.054364	0.031015	0.054364
3	-1.813133	0.309403	0.054357	0.031013	0.054357	0.031013	0.054357	0.031013	0.054357	0.031013	0.054357	0.031013	0.054357	0.031013	0.054357	0.031013	0.054357
4	-1.813121	0.309384	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356
5	-1.813120	0.309382	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356
6	-1.813120	0.309382	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356
7	-1.813120	0.309382	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics

Source	DF	Weighted SS	Weighted MS
Regression	3	0.427500000000	0.142500000000
Residual	9	0.03101260135	0.00344584459
Uncorrected Total	12	0.45851260135	
(Corrected Total)	11	0.14698278782	

Parameter	Estimate	Asymptotic Std. Error	Asymptotic 95 % Confidence Interval
LOG_EC50	-1.813119529	0.08828003006	-2.0128245302 -1.6134152272
SIGMA	0.309382110	0.10552411483	0.0706679469 0.5480962736
CO	0.054355700	0.00765754993	0.0370329716 0.0716784292

Asymptotic Correlation Matrix

Corr	LOG_EC50	SIGMA	CO
LOG_EC50	1		
SIGMA	-0.612654944	1	
CO	-0.76893536	0.5114210181	1

ryegrass root weight
 MODEL: COUNT = CO * PROBNOIR ((LOG_EC50 - LOG_CONC) / SIGMA)
 SUMMARY OF NONLINEAR REGRESSION
 12:17 Thursday, January 8, 1998

OBS	CONC	LOG_EC50	SIGMA	CO	RESID_SS	EC50
1	0	-1.81312	0.30938	0.054356	0.031013	0.015377

ryegrass root weight
 MODEL: YOUNG = CO * PROBNOIR ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
 WEIGHTED REGRESSION
 12:17 Thursday, January 8, 1998

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

		ryegrass root weight				12:17 Thursday, January 8, 1998				11
OBS	CONC	LOG_CONC	Y1	Y2	Y3	Y4	Y5	Y6		
1	0.0000		0.0639	0.0588	0.0424	.	.	.	.	
2	0.0076	-2.11919	0.0228	0.0420	0.0670	.	.	.	.	
3	0.0140	-1.85387	0.0378	0.0279	0.0284	.	.	.	.	
4	0.0260	-1.58503	0.0149	0.0138	0.0078	.	.	.	.	

ryegrass root weight
 MODEL: COUNT = CO * PROBNOIR ((LOG_EC50 - LOG_CONC) / SIGMA)
 WEIGHTED REGRESSION

12:17 Thursday, January 8, 1998

		Non-Linear Least Squares Iterative Phase				Dependent Variable COUNT				Method: Gauss-Newton				Weighted SS			
Iter	Log EC50	SIGMA	CO	Weighted SS	CO	Weighted SS	CO	Weighted SS	CO	Weighted SS	CO	Weighted SS	CO	Weighted SS	CO	Weighted SS	CO
0	-1.827000	0.338000	0.055000	0.031758	0.055000	0.031758	0.055000	0.031758	0.055000	0.031758	0.055000	0.031758	0.055000	0.031758	0.055000	0.031758	0.055000
1	-1.814283	0.311008	0.054469	0.031013	0.054469	0.031013	0.054469	0.031013	0.054469	0.031013	0.054469	0.031013	0.054469	0.031013	0.054469	0.031013	0.054469
2	-1.813239	0.309568	0.054364	0.031015	0.054364	0.031015	0.054364	0.031015	0.054364	0.031015	0.054364	0.031015	0.054364	0.031015	0.054364	0.031015	0.054364
3	-1.813133	0.309403	0.054357	0.031013	0.054357	0.031013	0.054357	0.031013	0.054357	0.031013	0.054357	0.031013	0.054357	0.031013	0.054357	0.031013	0.054357
4	-1.813121	0.309384	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356
5	-1.813120	0.309382	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356
6	-1.813120	0.309382	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356
7	-1.813120	0.309382	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics

Source	DF	Weighted SS	Weighted MS
Regression	3	0.427500000000	0.142500000000
Residual	9	0.03101260135	0.00344584459
Uncorrected Total	12	0.45851260135	
(Corrected Total)	11	0.14698278782	

Parameter	Estimate	Asymptotic Std. Error	Asymptotic 95 % Confidence Interval
LOG_EC50	-1.813119529	0.08828003006	-2.0128245302 -1.6134152272
SIGMA	0.309382110	0.10552411483	0.0706679469 0.5480962736
CO	0.054355700	0.00765754993	0.0370329716 0.0716784292

Asymptotic Correlation Matrix

Corr	LOG_EC50	SIGMA	CO
LOG_EC50	1		
SIGMA	-0.612654944	1	
CO	-0.76893536	0.5114210181	1

ryegrass root weight
 MODEL: COUNT = CO * PROBNOIR ((LOG_EC50 - LOG_CONC) / SIGMA)
 SUMMARY OF NONLINEAR REGRESSION
 12:17 Thursday, January 8, 1998

OBS	CONC	LOG_EC50	SIGMA	CO	RESID_SS	EC50
1	0	-1.81312	0.30938	0.054356	0.031013	0.015377

ryegrass root weight
 MODEL: YOUNG = CO * PROBNOIR ((LOG_EC25 - LOG_CONC) / SIGMA - 0.67449)
 WEIGHTED REGRESSION
 12:17 Thursday, January 8, 1998

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

		ryegrass root weight				12:17 Thursday, January 8, 1998				11
OBS	CONC	LOG_CONC	Y1	Y2	Y3	Y4	Y5	Y6		
1	0.0000		0.0639	0.0588	0.0424	.	.	.	.	
2	0.0076	-2.11919	0.0228	0.0420	0.0670	.	.	.	.	
3	0.0140	-1.85387	0.0378	0.0279	0.0284	.	.	.	.	
4	0.0260	-1.58503	0.0149	0.0138	0.0078	.	.	.	.	

ryegrass root weight
 MODEL: COUNT = CO * PROBNOIR ((LOG_EC50 - LOG_CONC) / SIGMA)
 WEIGHTED REGRESSION

12:17 Thursday, January 8, 1998

		Non-Linear Least Squares Iterative Phase				Dependent Variable COUNT				Method: Gauss-Newton				Weighted SS			
Iter	Log EC50	SIGMA	CO	Weighted SS	CO	Weighted SS	CO	Weighted SS	CO	Weighted SS	CO	Weighted SS	CO	Weighted SS	CO	Weighted SS	CO
0	-1.827000	0.338000	0.055000	0.031758	0.055000	0.031758	0.055000	0.031758	0.055000	0.031758	0.055000	0.031758	0.055000	0.031758	0.055000	0.031758	0.055000
1	-1.814283	0.311008	0.054469	0.031013	0.054469	0.031013	0.054469	0.031013	0.054469	0.031013	0.054469	0.031013	0.054469	0.031013	0.054469	0.031013	0.054469
2	-1.813239	0.309568	0.054364	0.031015	0.054364	0.031015	0.054364	0.031015	0.054364	0.031015	0.054364	0.031015	0.054364	0.031015	0.054364	0.031015	0.054364
3	-1.813133	0.309403	0.054357	0.031013	0.054357	0.031013	0.054357	0.031013	0.054357	0.031013	0.054357	0.031013	0.054357	0.031013	0.054357	0.031013	0.054357
4	-1.813121	0.309384	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356
5	-1.813120	0.309382	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356
6	-1.813120	0.309382	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356
7	-1.813120	0.309382	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356	0.031013	0.054356

NOTE: Convergence criterion met.

Non-Linear Least Squares Summary Statistics

Source	DF	Weighted SS	Weighted MS
Regression	3	0.427500000000	0.142500000000
Residual	9	0.03101260135	0.00344584459
Uncorrected Total	12	0.45851260135	
(Corrected Total)	11	0.14698278782	

Parameter	Estimate	Asymptotic Std. Error	Asymptotic 95 % Confidence Interval
LOG_EC50	-1.813119529	0.08828003006	-2.0128245302 -1.6134152272
SIGMA	0.309382110	0.10552411483	0.0706679469 0.5480962736
CO	0.054355700	0.00765754993	0.0370329716 0.0716784292

Asymptotic Correlation Matrix

Source	DF	Type I SS	Mean Square	F Value	Pr > F
DOSE	3	0.00304242	0.00101414	6.12	0.0182
Source	DF	Type III SS	Mean Square	F Value	Pr > F
DOSE	3	0.00304242	0.00101414	6.12	0.0182

**DATA EVALUATION RECORD
VEGETATIVE VIGOR TEST
§ 122-1 (TIER I)**

1. **CHEMICAL:** Isoxaflutole **PC Code No.:** 123000

2. **TEST MATERIAL:** RPA 203328 **Purity:** 99%

3. **CITATION:**

Author: D. Teixeira
Title: RPA 203328 - Determination of Effects on
Vegetative Vigor of Ten Plant Species

Study Completion Date: September 19, 1997

Laboratory: Springborn Laboratories, Inc., Wareham,
MA

Sponsor: Rhone-Poulenc Ag Company, Research
Triangle Park, NC

Laboratory Report ID: 97-9-7082

MRID No.: 443999-06

DP Barcode: D240106

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

Signature:

[Signature]
for MAM

Date:

1/12/98

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

Signature:

P. Kosalwat

Date:

1/12/98

5. **APPROVED BY:**

Signature:

[Signature]

Date:

1/28/98

6. **STUDY PARAMETERS:**

Definitive Study Duration: 14 days

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements for a Tier I vegetative vigor study with terrestrial plants. None of the parameters measured were affected by 25% or more for all ten test species when treated at the maximum label rate of 0.14 lb ai/A (0.13 lb ai/A measured rate).

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 plants per rep 5	5
Source of Seed	Untreated seed obtained from various commercial suppliers

B. Test System

Guideline Criteria	Reported Information
Solvent	10% acetone solution
Site of test	Growth chamber
Planting method / type of pot	Two- to six-day-old seedlings planted into polypropylene pots (13-cm top diameter) and allowed to grow for 7 days
Method of application	140 μ L of solution applied to each pot by overhead atomizer
Method of watering	Subirrigation
Growth stage at application 1-3 true leaf stage.	1-2 true leaf stage

C. Test Design

Guideline Criteria	Reported Information
Dose range 2x or 3x	N/A
Doses At least 5	1 (0.14 lb ai/A)
Controls Negative and solvent	Negative and solvent control groups
Replicates per dose At least 3	3
Duration of test 14 days	14 days
Were observations made at least weekly?	Observations made on days 7 and 14
Maximum labeled rate	0.14 lb ai/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?	N/A
Phytotoxic observations	Yes
Were initial chemical concentrations measured? (Optional)	The measured concentration averaged 93% 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 ai/A)	NOEL (lb ai/A)
Cabbage	shoot length = shoot weight	>0.13	0.13
Cucumber	shoot length = shoot weight	>0.13	0.13
Lettuce	shoot length = shoot weight	>0.13	0.13
Soybean	shoot length = shoot weight	>0.13	0.13
Tomato	shoot length = shoot weight	>0.13	0.13
Turnip	shoot length = shoot weight	>0.13	0.13
Corn	shoot length = shoot weight	>0.13	0.13
Oat	shoot length = shoot weight	>0.13	0.13
Onion	shoot length = shoot weight	>0.13	0.13
Ryegrass	shoot length = shoot weight	>0.13	0.13

Observations: No symptoms of test material toxicity were noted during the test.

Statistical Method: No statistical analyses were conducted.

- 13. VERIFICATION OF STATISTICAL RESULTS:** Tier I results indicated that none of the ten test species were injured by 25% or more for either parameter evaluated when compared to the solvent control data.
- 14. REVIEWER'S COMMENTS:** This study is scientifically sound and fulfills the guideline requirements for a Tier I vegetative vigor test. The study is classified as **Core**.

**DATA EVALUATION RECORD
SEEDLING EMERGENCE TEST
§ 122-1 (TIER I)**

1. **CHEMICAL:** Isoxaflutole **PC Code No.:** 123000

2. **TEST MATERIAL:** RPA 203328 **Purity:** 99%

3. **CITATION:**

Author: D. Teixeira
Title: RPA 203328 - Determination of Effects on
Seedling Emergence of Ten Plant Species
Study Completion Date: September 18, 1997
Laboratory: Springborn Laboratories, Inc., Wareham,
MA
Sponsor: Rhone-Poulenc Ag Company, Research
Triangle Park, NC
Laboratory Report ID: 97-9-7068
MRID No.: 443999-07
DP Barcode: D240106

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

Signature:  **Date:** 1/12/98

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

Signature: P. Kosalwat **Date:** 1/12/98

5. **APPROVED BY:**

Signature:  **Date:** 1/28/98

6. **STUDY PARAMETERS:**

Definitive Study Duration: 14 days

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements for a Tier I seedling emergence study with terrestrial plants. None of the parameters measured were affected by 25% or more for all ten test species when treated at the maximum label rate of 0.14 lb ai/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	≥85%

B. Test System

Guideline Criteria	Reported Information
Solvent	10% acetone solution
Site of test	Growth chamber
Planting method / type of pot	Planted at 1.0-cm depth/ polypropylene pots (13-cm top diameter)
Method of application	130 μ L of solution applied to each pot by overhead atomizer
Method of watering	Subirrigation
Growth stage at application Seed or plant.	Seed

C. Test Design

Guideline Criteria	Reported Information
Dose range 2x or 3x	N/A
Doses At least 5	1 (0.14 lb ai/A)
Controls Negative and solvent	Negative and solvent control groups
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	0.14 lb ai/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?	N/A
Phytotoxic observations	Yes
Were initial chemical concentrations measured? (Optional)	The measured concentration averaged 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 ai/A)	NOEL (lb ai/A)
Cabbage	emergence = shoot length	>0.14	0.14
Cucumber	emergence = shoot length	>0.14	0.14
Lettuce	emergence = shoot length	>0.14	0.14
Soybean	emergence = shoot length	>0.14	0.14
Tomato	emergence = shoot length	>0.14	0.14
Turnip	emergence = shoot length	>0.14	0.14
Corn	emergence = shoot length	>0.14	0.14
Oat	emergence = shoot length	>0.14	0.14
Onion	emergence = shoot length	>0.14	0.14
Ryegrass	emergence = shoot length	>0.14	0.14

Observations: No symptoms of test material toxicity were noted during the test.

Statistical Method: No statistical analyses were conducted.

13. VERIFICATION OF STATISTICAL RESULTS: Tier I results indicated that none of the ten test species were injured by 25% or more for either parameter evaluated when compared to the solvent control data.
14. REVIEWER'S COMMENTS: This study is scientifically sound and fulfills the guideline requirements for a Tier I seedling emergence test. The study is classified as **Core**.

DATA EVALUATION RECORD
ALGAE OR DIATOM EC₅₀ TEST
GUIDELINE 123-2 (TIER II)

1. CHEMICAL: Isoxaflutole PC Code No.: 123000

2. TEST MATERIAL: RPA 202248 technical Purity: 99.9%

3. CITATION:

Author: J.R. Hoberg
Title: RPA 202248 Technical - Toxicity to the
Freshwater Green Alga, *Selenastrum*
capricornutum

Study Completion Date: September 17, 1997

Laboratory: Springborn Laboratories, Inc., Wareham,
MA

Sponsor: Rhone-Poulenc Ag Company, Research
Triangle Park, NC

Laboratory Report ID: 97-9-7073

DP Barcode: D240106

MRID No.: 443999-08

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

Signature:

Date: 1/13/98

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

Signature:

P. Kosalwat

Date: 1/13/98

5. APPROVED BY:

Signature:

Michael Dany

Date:

1/26/98

6. STUDY PARAMETERS:

Definitive Test Duration: 120 hours

Type of Concentrations: Mean measured

7. CONCLUSIONS: This study is scientifically sound and fulfills
the guideline requirements for an algal toxicity test.

Results Synopsis

EC₅₀: 5.0 ppm ai
NOEC: 0.08 ppm ai

95% C.I.: 4.6 - 5.4 ppm ai
Probit Slope: N/A

8. ADEQUACY OF THE STUDY:**A. Classification:** Core**B. Rationale:** N/A**C. Repairability:** N/A**9. GUIDELINE DEVIATIONS:** None noted.**10. SUBMISSION PURPOSE:****11. MATERIALS AND METHODS:****A. Test Organisms**

Guideline Criteria	Reported Information
<u>Species</u> <i>Skeletonema costatum</i> <i>Anabaena flos-aquae</i> <i>Selenastrum capricornutum</i> <i>Navicula pelliculosa</i>	<i>Selenastrum capricornutum</i>
<u>Initial Number of Cells</u> 3,000 - 10,000 cells/ml	3,000 cells/ml
<u>Nutrients</u> Standard formula, e.g. 20XAAP	AAP medium

B. Test System

Guideline Criteria	Reported Information
<u>Solvent</u>	Acetone (0.1 mL/L)
<u>Temperature</u> <i>Skeletonema</i> : 20°C Others: 24-25°C	24°C
<u>Light Intensity</u> <i>Anabaena</i> : 2.0 KLux (±15%) Others: 4.0-5.0 KLux (±15%)	3.4 - 4.3 KLux
<u>Photoperiod</u> <i>Skeletonema</i> : 14 h light, 10 h dark or 16 h light, 8 h dark Others: Continuous	Continuous

Guideline Criteria	Reported Information
pH Skeletonema: approx. 8.0 Others: approx. 7.5	Initial 7.1 - 7.5 Final 7.3 - 8.9

C. Test Design

Guideline Criteria	Reported Information
<u>Dose range</u> 2X or 3X progression	3X
<u>Doses</u> at least 5	0.024, 0.081, 0.27, 0.90, 3.0, and 10 mg active ingredient (ai)/L
<u>Controls</u> negative and/or solvent	Negative and solvent
<u>Replicates per dose</u> 3 or more	3
<u>Duration of test</u> 120 hours	120 hours
Daily observations were made?	Yes
<u>Method of Observations</u>	Cellular counts
<u>Maximum Labeled Rate</u>	0.14 lb ai/acre

12. REPORTED RESULTS

Guideline Criteria	Reported Information
Initial and 120 h cell densities were measured?	Yes
Control cell count at 120 hr $\geq$ 2X initial count?	Yes
Initial chemical concentrations measured? (Optional)	Yes
Raw data included?	Yes

Dose Response

Mean Measured Concentration (mg ai/L)	Terminal Avg. Cell Density (x 10 ⁴ cells/ml)	% Inhibition*	120-Hour pH
Control	150	N/A	8.9
Solvent Control	154	N/A	8.9
0.024	154	-1.2	8.9
0.077	152	0.6	8.9
0.29	149	2.1	8.9
0.86	146	4.0	8.7
2.9	142	6.6	8.6
9.4	6	96	7.3

*Compared to the pooled control.

Other Significant Results: At termination, cells exposed at the four highest-concentration treatment levels appeared bloated. Some cells in the 2.9 and 9.4 mg ai/L groups were also reported as fragmented. Cells in the two lowest-concentration treatment groups and in the control groups were normal in appearance.

Statistical Results

Statistical Method: linear regression and Williams' test

EC₅₀: 5.5 ppm ai

95% C.I.: 3.3 - 7.8 ppm ai

Probit Slope: N/A

NOEC: 0.29 ppm ai

13. VERIFICATION OF STATISTICAL RESULTS

Statistical Method: Moving average angle for the EC value and Williams' test for mean separation. Comparison to the solvent control.

EC₅₀: 5.0 ppm ai

95% C.I.: 4.6 - 5.4 ppm ai

Probit Slope: N/A

NOEC: 0.08 ppm ai

- 14. REVIEWER'S COMMENTS:** This study is scientifically sound and fulfills the guideline requirements for an algal toxicity test. This study is categorized as **Core**.

Selenastrum cell density
 File: sel Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	Sol. Con.	3	154.667	154.667	154.667
2	0.024 ppm ai	3	154.333	154.333	154.333
3	0.077 ppm ai	3	151.667	151.667	151.667
4	0.29 ppm ai	3	149.333	149.333	149.333
5	0.86 ppm ai	3	146.667	146.667	146.667
6	2.9 ppm ai	3	142.333	142.333	142.333
7	9.4 ppm ai	3	6.033	6.033	6.033

Selenastrum cell density
 File: sel 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
Sol. Con.	154.667				
0.024 ppm ai	154.333	0.114		1.76	k= 1, v=14
0.077 ppm ai	151.667	1.024		1.85	k= 2, v=14
0.29 ppm ai	149.333	1.820		1.88	k= 3, v=14
0.86 ppm ai	146.667	2.730	*	1.89	k= 4, v=14
2.9 ppm ai	142.333	4.209	*	1.90	k= 5, v=14
9.4 ppm ai	6.033	50.722	*	1.91	k= 6, v=14

s = 3.589

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

*Since bloated cells were observed, in the 0.29 ppm ai group,
 the NOEC will be reported as:*

0.08 ppm ai

Mossler isoxaflutole deg Selenastrum capricornutum 1-12-98

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
9.399999		100	96	96
2.9	100	8	8	0

BECAUSE THE NUMBER OF ORGANISMS USED WAS SO LARGE, THE 95 PERCENT
 CONFIDENCE INTERVALS CALCULATED FROM THE BINOMIAL PROBABILITY ARE
 UNRELIABLE. USE THE INTERVALS CALCULATED BY THE OTHER TESTS.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 4.990245

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
1	1.687528E-02	4.990245	4.615594	5.386937

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
2		3.279296E-02	1

(CANNOT BE CALCULATED)

SLOPE = 6.178913
 95 PERCENT CONFIDENCE LIMITS = 5.059984 AND 7.297842

LC50 = 4.895485
 95 PERCENT CONFIDENCE LIMITS = 4.410958 AND 5.456474

LC10 = 3.049706
 95 PERCENT CONFIDENCE LIMITS = 2.639166 AND 3.427404

**DATA EVALUATION RECORD
AQUATIC PLANT EC₅₀ TEST
GUIDELINE 123-2 (TIER II)**

1. **CHEMICAL:** Isoxaflutole **PC Code No.:** 123000

2. **TEST MATERIAL:** RPA 202248 technical **Purity:** 99.9%

3. **CITATION:**

Author: J.R. Hoberg

Title: RPA 202248 Technical - Toxicity to
Duckweed, *Lemna gibba*

Study Completion Date: September 16, 1997

Laboratory: Springborn Laboratories, Inc., Wareham,
MA

Sponsor: Rhone-Poulenc Ag Company, Research
Triangle Park, NC

Laboratory Report ID: 97-9-7066

DP Barcode: D240106

MRID No.: 443999-09

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

Signature: 

Date: 1/13/98

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

Signature: P. Kosalwat

Date: 1/13/98

5. **APPROVED BY:**

Signature: 

Date: 1/28/98

6. **STUDY PARAMETERS:**

Definitive Test Duration: 14 days

Type of Concentrations: Mean measured

7. **CONCLUSIONS:** This study is scientifically sound and fulfills
the guideline requirements for an aquatic plant toxicity
test.

Results Synopsis:

EC₅₀: 0.075 ppm ai
Probit Slope: N/A

95% C.I.: 0.065 - 0.088 ppm ai
NOEC: 0.009 ppm ai

8. ADEQUACY OF THE STUDY:**A. Classification:** Core**B. Rationale:** N/A**C. Repairability:** N/A**9. GUIDELINE DEVIATIONS:** None noted.**10. SUBMISSION PURPOSE:****11. MATERIALS AND METHODS:****A. Test Organisms**

Guideline Criteria	Reported Information
<u>Species</u> <i>Lemna gibba</i>	<i>Lemna gibba</i>
<u>Number of Plants/Fronds</u> 5 plants, 3 fronds each	15 fronds/replicate (5 plants with 3 fronds each)
<u>Nutrients</u> Standard formula, e.g. 20XAAP	Hoagland's medium

B. Test System

Guideline Criteria	Reported Information
<u>Solvent</u>	Acetone (0.1 mL/L)
<u>Temperature</u> 25°C	24-25°C
<u>Light Intensity</u> 5.0 KLux ($\pm 15\%$)	3.4-4.1 KLux
<u>Photoperiod</u> Continuous	Continuous
<u>Test System</u> Static or Renewal	Renewal at 3-day intervals
<u>pH</u> Approx. 5.0	5.1-6.5

C. Test Design

Guideline Criteria	Reported Information
<u>Dose range</u> 2X or 3X progression	2X
<u>Doses</u> at least 5	0.0093, 0.019, 0.039, 0.075, 0.15, and 0.30 mg active ingredient (ai)/L
<u>Controls</u> negative and/or solvent	Negative and solvent control
<u>Replicates per dose</u> 3 or more	3
<u>Duration of test</u> 14 days	14 days
Daily observations were made?	Frond counts were made on days 3, 6, 9, 12, and 14 of the study
<u>Method of Observations</u>	Number of fronds and dry weight
<u>Maximum Labeled Rate</u>	0.14 lb ai/A

12. REPORTED RESULTS:

Guideline Criteria	Reported Information
Initial and 14 day frond numbers were measured?	Yes
Control frond at 14 days $\geq 2X$ initial count?	Yes
Initial chemical concentrations measured? (Optional)	Results are based on mean measured concentrations computed from day 0 and 3 measurements
Raw data included?	Yes

Dose Response

Mean Measured concentration (mg ai/L)	Terminal Avg. Frond Number	% Inhibition*	14-day pH
Control	416	N/A	6.2
Solvent Control	432	N/A	6.5
0.0091	457	-7.9	6.5
0.022	408	3.6	6.3
0.039	263	38	6.3
0.075	168	60	6.1
0.15	146	65	6.0
0.27	117	72	5.9

*Based on comparison to the pooled control.

Other Significant Results: Fronds on plants in the four highest-concentration groups appeared chlorotic, smaller, curled, and had less root formation in comparison to the control plants, which appeared normal. The fronds of plants in the 0.022 treatment group also appeared chlorotic and were smaller and had less root formation than the control plants.

Statistical Results for Frond Number

Statistical Method: linear regression and Williams' test

EC₅₀: 0.083 ppm ai

95% C.I.: 0.031 - 0.23 ppm ai

Probit Slope: N/A

NOEC: 0.022 ppm ai

13. VERIFICATION OF STATISTICAL RESULTS:

Statistical Method: The dose response could not be adequately modeled using probit analysis with subsequent non-linear remodeling. Consequently, the moving average method was used to determine the EC₅₀ value. Williams' test was used to determine the NOEC.

EC₅₀: 0.075 ppm ai

95% C.I.: 0.065 - 0.088 ppm ai

Probit Slope: N/A

NOEC: 0.009 ppm ai

14. REVIEWER'S COMMENTS: This study is scientifically sound, fulfills the guideline requirements for an aquatic plant toxicity test, and is categorized as **Core**.

Lemna frond number

File: lem Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)

TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	Sol. Con.	3	431.667	431.667	444.333
2	0.0091 ppm ai	3	457.000	457.000	444.333
3	0.022 ppm ai	3	408.333	408.333	408.333
4	0.039 ppm ai	3	263.333	263.333	263.333
5	0.075 ppm ai	3	167.667	167.667	167.667
6	0.15 ppm ai	3	146.333	146.333	146.333
7	0.27 ppm ai	3	117.333	117.333	117.333

Lemna frond number

File: lem 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
Sol. Con.	444.333				
0.0091 ppm ai	444.333	0.418		1.76	k= 1, v=14
0.022 ppm ai	408.333	0.769		1.85	k= 2, v=14
0.039 ppm ai	263.333	5.550	*	1.88	k= 3, v=14
0.075 ppm ai	167.667	8.704	*	1.89	k= 4, v=14
0.15 ppm ai	146.333	9.408	*	1.90	k= 5, v=14
0.27 ppm ai	117.333	10.364	*	1.91	k= 6, v=14

s = 37.146

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

*Since nonlethal effects were noted
at the 0.022 ppm ai level,
NOEC will be reported as:
0.009 ppm ai*

Mossler isoxaflutole lemna gibba 1-12-98

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
.27	100	73	73	0
.15	100	66	66	0
.075	100	61	61	0
.039	100	39	39	0
.022	100	6	6	0

BECAUSE THE NUMBER OF ORGANISMS USED WAS SO LARGE, THE 95 PERCENT CONFIDENCE INTERVALS CALCULATED FROM THE BINOMIAL PROBABILITY ARE UNRELIABLE. USE THE INTERVALS CALCULATED BY THE OTHER TESTS.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 5.408327E-02

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS
4	3.261201E-02	.0753329	6.466601E-02 8.768728E-02

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
4	.7883758	7.796878	0

A PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001.

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 1.617662
95 PERCENT CONFIDENCE LIMITS = .1813314 AND 3.053993

LC50 = 8.089726E-02
95 PERCENT CONFIDENCE LIMITS = 1.803023E-02 AND .5046692

LC10 = 1.326936E-02
95 PERCENT CONFIDENCE LIMITS = 9.482018E-09 AND 3.651794E-02

**DATA EVALUATION RECORD
AQUATIC PLANT EC₅₀ TEST
GUIDELINE 122-2 (TIER I)**

1. **CHEMICAL:** Isoxaflutole PC Code No.: 123000

2. **TEST MATERIAL:** RPA 203328 Purity: 99%

3. **CITATION:**

Author: J.R. Hoberg
Title: RPA 203328 Technical - Toxicity to
Duckweed, *Lemna gibba*
Study Completion Date: September 17, 1997
Laboratory: Springborn Laboratories, Inc., Wareham,
MA
Sponsor: Rhone-Poulenc Ag Company, Research
Triangle Park, NC
Laboratory Report ID: 97-9-7067
DP Barcode: D240106
MRID No.: 443999-10

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

Signature:

Date: 1/13/98

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

Signature:

Date: 1/13/98

5. **APPROVED BY:**

Signature:

Date: 1/26/98

6. **STUDY PARAMETERS:**

Definitive Test Duration: 14 days
Type of Concentrations: Mean measured

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements for an aquatic plant toxicity test. RPA 203328 did not adversely affect the growth of *L. gibba* by 25% or more at a concentration of 9.8 ppm ai (equivalent to ten times the maximum application rate).

8. **ADEQUACY OF THE STUDY:**

A. Classification: Core

B. Rationale: N/A

C. Repairability: N/A

9. GUIDELINE DEVIATIONS: None noted.

10. SUBMISSION PURPOSE:

11. MATERIALS AND METHODS:

A. Test Organisms

Guideline Criteria	Reported Information
<u>Species</u> <i>Lemna gibba</i>	<i>Lemna gibba</i>
<u>Number of Plants/Fronds</u> 5 plants, 3 fronds each	15 fronds/replicate (5 plants with 3 fronds each)
<u>Nutrients</u> Standard formula, e.g. 20XAAP	Hoagland's medium

B. Test System

Guideline Criteria	Reported Information
<u>Solvent</u>	Acetone (0.1 mL/L)
<u>Temperature</u> 25°C	24-25°C
<u>Light Intensity</u> 5.0 KLux (+15%)	3.2-4.2 KLux
<u>Photoperiod</u> Continuous	Continuous
<u>Test System</u> Static or Renewal	Renewal at 3-day intervals
<u>pH</u> Approx. 5.0	5.1-6.3

C. Test Design

Guideline Criteria	Reported Information
<u>Dose range</u> 2X or 3X progression	N/A
<u>Doses</u> at least 5	0.1 and 10 mg active ingredient (ai)/L
<u>Controls</u> negative and/or solvent	Negative and solvent control
<u>Replicates per dose</u> 3 or more	3
<u>Duration of test</u> 14 days	14 days
Daily observations were made?	Frond counts were made on days 3, 6, 9, 12, and 14 of the study
<u>Method of Observations</u>	Number of fronds and dry weight
<u>Maximum Labeled Rate</u>	0.14 lb ai/A

12. REPORTED RESULTS:

Guideline Criteria	Reported Information
Initial and 14 day frond numbers were measured?	Yes
Control frond at 14 days $\geq$ 2X initial count?	Yes
Initial chemical concentrations measured? (Optional)	Results are based on mean measured concentrations computed from day 0 and 3 measurements
Raw data included?	Yes

Dose Response

Mean Measured concentration (mg ai/L)	Terminal Avg. Frond Number	% Inhibition*	14-day pH
Control	448	N/A	6.1
Solvent Control	394	N/A	6.3
0.10	412	-4.6	6.3
9.8	392	0.4	6.3

*Based on comparison to the solvent control.

Other Significant Results: None noted.
Statistical Results for Frond Number

Statistical Method: Dunnett's test

EC₅₀: >9.8 ppm ai 95% C.I.: N/A
 Probit Slope: N/A NOEC: 9.8 ppm ai

13. VERIFICATION OF STATISTICAL RESULTS: It is apparent from the results that the test material did not adversely affect the growth or reproduction of duckweed. Consequently, no statistical analyses were conducted.
14. REVIEWER'S COMMENTS: This study is scientifically sound, fulfills the guideline requirements for an aquatic plant toxicity test, and is categorized as **Core**.