

DATA EVALUATION RECORD
SEEDLING EMERGENCE TIER I/TIER II TEST
§ 122-1/123-1

1. CHEMICAL: Cloransulam-methyl PC Code No.: 129116

2. TEST MATERIALS: 5-OH Cloransulam - >97% purity
5-OH Cloransulam-methyl - >95% purity
Cloransulam - 99% purity

3. CITATION:

Authors: J.R. Porch, H. Krueger, and R.W. McCormick

Title: Effect of Three Soil Metabolites of Cloransulam-methyl on the Emergence and Vegetative Vigor of Non-Target Terrestrial Plants (Tier I/II)

Study Completion Date: January 15, 1999

Laboratory: Wildlife International Ltd., Easton, MD

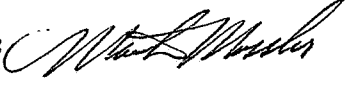
Sponsor: Dow AgroSciences LLC, Indianapolis, IN

Laboratory Report ID: 379-101

DP Barcode: D252903

MRID No.: 447445-16

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

Signature: 

Date: 3/30/99

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

Signature: P. Kosalwat

Date: 3/30/99

5. APPROVED BY:

Signature: 

Date: 4/15/99

6. STUDY PARAMETERS:

Definitive Study Duration: 14 days

7. CONCLUSIONS: This study is scientifically sound and fulfills the guideline requirements for a seedling emergence study with terrestrial plants. The two hydroxy metabolites do not affect the emergence and growth of the ten tested plant species. The demethylated metabolite only affected the growth of one dicot species (radish), with EC₂₅ and NOEL values of 0.052 and 0.019 lb ai/A, respectively.

33 / 301

8. ADEQUACY OF THE STUDY:

- A. Classification: Core.
- B. Rationale: N/A.
- C. Repairability: N/A.

9. GUIDELINE DEVIATIONS: The organic matter content of the soil (1.9%) was greater than recommended (1.0%).

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> cucumber, radish, soybean, sugarbeet, sunflower, tomato <u>Monocots:</u> corn, onion, barnyardgrass, wheat
Number of seeds per rep 10	10
Source of Seed	Commercial suppliers
Historical % Germination of Seed	Seed viability in testing ranged from 76 to 100%

B. Test System

Guideline Criteria	Reported Information
Solvent	20% methanol:acetonitrile (1:1), 80% deionized water
Site of test	Greenhouse
Planting method / type of pot	Planted within 48 hours of application in 16 x 12 cm plastic pots
Method of application	Pressurized sprayer
Method of watering	Subirrigation

Guideline Criteria	Reported Information
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	Tier I - 0.0548 lb ai/A Tier II - 0.0017, 0.0034, 0.0069, 0.0137, 0.0274, and 0.0548 lb ai/A
Controls Negative and solvent	Negative and solvent control groups
Replicates per dose At least 3	4 replicates
Duration of test 14 days	14 days
Were observations made at least weekly?	Observations made on days 10 and 14
Maximum labeled rate	Maximum label rate of parent material is 61.5 g ai/ha (0.0548 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
Phytotoxic observations	Yes

Guideline Criteria	Reported Information
Were initial chemical concentrations measured? (Optional) Percent of nominal, Procedural recovery, Limit of quantitation (LOQ)	Treatment solutions were analyzed by HPLC: 86-101% of nominal, Procedural recovery and LOQ not reported
Were adequate raw data included?	Yes

5-OH Cloransulam

Results for the most sensitive parameter of each species

Species	Parameter	Inhibition (%) [*]
Cucumber	emergence	3
Radish	shoot fresh weight	9
Soybean	height	3
Sugarbeet	emergence	8
Sunflower	emergence	13
Tomato	no parameter inhibited	N/A
Barnyardgrass	shoot fresh weight	13
Corn	shoot fresh weight	5
Onion	emergence = height	9
Wheat	emergence	3

^{*}The authors reported inhibition based on comparison to the pooled control. The values reported in the table are converted to comparison to the solvent control by the reviewer.

5-OH Cloransulam-methyl

Results for the most sensitive parameter of each species

Species	Parameter	Inhibition (%) [*]
Cucumber	emergence	3
Radish	shoot fresh weight	2
Soybean	no parameter inhibited	N/A
Sugarbeet	emergence	14

Species	Parameter	Inhibition (%)*
Sunflower	no parameter inhibited	N/A
Tomato	emergence	21
Barnyardgrass	shoot fresh weight	18
Corn	shoot fresh weight	9
Onion	shoot fresh weight	3
Wheat	emergence	5

*The authors reported inhibition based on comparison to the pooled control. The values reported in the table are converted to comparison to the solvent control by the reviewer.

Cloransulam

Results for the most sensitive parameter of each species

Species	Parameter	Inhibition (%)*
Cucumber	emergence	3
Radish	shoot fresh weight	19
Soybean	no parameter inhibited	N/A
Sugarbeet	emergence	3
Sunflower	emergence	3
Tomato	emergence	6
Barnyardgrass	shoot fresh weight	21
Corn	shoot fresh weight	3
Onion	emergence	23
Wheat	no parameter inhibited	N/A

*The authors reported inhibition based on comparison to the pooled control. The values reported in the table are converted to comparison to the solvent control by the reviewer.

Observations: Based on signs of cloransulam-treatment related effects (aberrant leaf formation, chlorosis, and necrosis) and reductions in height and weight, radish was advanced to Tier II emergence testing. The results for the most sensitive parameter (converted from g ai/ha to lb ai/A) are tabularized below.

Species	Parameter	EC ₂₅ (lb ai/A)	NOEL* (lb ai/A)
Radish	phytotoxicity	0.052	0.019

*The NOEL is the EC₅ value.

Statistical Method: For Tier I data, no methods other than direct comparison were used to advance plants to Tier II. For Tier II data, the linear interpolation and resampling methods of Norberg-King were used to determine the EC₂₅ and NOEL (EC₅) values.

13. VERIFICATION OF STATISTICAL RESULTS: Williams' test was used to determine the NOEL and linear interpolation was used to estimate the EC₂₅ value. Comparison was made to the solvent control. These two values were 0.027 and 0.052 lb ai/A, respectively.
14. REVIEWER'S COMMENTS: It is apparent that the two hydroxy metabolites do not affect the emergence and growth of the ten tested plant species. The demethylated metabolite only affected the growth of one species (radish), with EC₂₅ and NOEL values of 0.052 and 0.019 lb ai/A, respectively.

The organic matter content of the soil used in the study was reported to be 1.9%. The maximum organic matter content suggested by EPA for a seedling emergence test is 1%. Future studies should be conducted with a soil that contains less organic matter. This study is scientifically sound and fulfills the guideline requirements. The study is classified as Core.

Radish phytotoxicity

File: rad Transform: ARC SINE(SQUARE ROOT(Y))

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	Sol. Con.	4	0.972	1.367	1.396
2	0.0017 lb ai/A	4	0.993	1.408	1.396
3	0.0034 lb ai/A	4	1.000	1.412	1.396
4	0.0069 lb ai/A	4	0.950	1.336	1.340
5	0.0137 lb ai/A	4	0.953	1.344	1.340
6	0.0274 lb ai/A	4	0.922	1.312	1.312
7	0.0548 lb ai/A	4	0.720	1.019	1.019

Radish phytotoxicity

File: rad Transform: ARC SINE(SQUARE ROOT(Y))

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
Sol. Con.	1.396				
0.0017 lb ai/A	1.396	0.402		1.72	k= 1, v=21
0.0034 lb ai/A	1.396	0.402		1.80	k= 2, v=21
0.0069 lb ai/A	1.340	0.384		1.83	k= 3, v=21
0.0137 lb ai/A	1.340	0.384		1.84	k= 4, v=21
0.0274 lb ai/A	1.312	0.768		1.85	k= 5, v=21
0.0548 lb ai/A	1.019	4.894	*	1.85	k= 6, v=21

s = 0.101

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

NOEL = 0.0274 lb ai/A

7