

1-21-93

(39)

DP Barcode : D181718
PC Code No : 101101
EEB Out :

To: Walter Waldrop
Product Manager 71
Special Review and Reregistration Division (H7508W)

From: Anthony F. Maciorowski, Chief
Ecological Effects Branch/EFED (H7507C)

Attached, please find the EEB review of...

Reg./File # : 101101-
Chemical Name : Metribuzin
Type Product : Herbicide
Product Name : Sencor Technical
Company Name : Miles Inc.
Purpose : Data review - toxicity to freshwater green
algae

Action Code : 627 Date Due : 11/17/92
Reviewer : C. Laird Date In : 08/24/92

EEB Guideline/MRID Summary Table: The review in this package contains an evaluation of the following:

GDLN NO	MRID NO	CAT	GDLN NO	MRID NO	CAT	GDLN NO	MRID NO	CAT
71-1(A)			72-2(A)			72-7(A)		
71-1(B)			72-2(B)			72-7(B)		
71-2(A)			72-3(A)			122-1(A)		
71-2(B)			72-3(B)			122-1(B)		
71-3			72-3(C)			122-2		
71-4(A)			72-3(D)			123-1(A)		
71-4(B)			72-3(E)			123-1(B)		
71-5(A)			72-3(F)			123-2	424383-01	N
71-5(B)			72-4(A)			124-1		
72-1(A)			72-4(B)			124-2		
72-1(B)			72-5			141-1		
72-1(C)			72-6			141-2		
72-1(D)						141-5		

Y=Acceptable (Study satisfied Guideline)/Concur

P=Partial (Study partially fulfilled Guideline but
additional information is needed)

S=Supplemental (Study provided useful information but Guideline was
not satisfied)

N=Unacceptable (Study was rejected)/Nonconcur

DP BARCODE: D181718

REREG CASE #

CASE: 819350
SUBMISSION: S423712

DATA PACKAGE RECORD
BEAN SHEET

DATE: 01/12/93
Page 1 of 1

* * * CASE/SUBMISSION INFORMATION * * *

CASE TYPE: REREGISTRATION ACTION: 627 GENERIC DATA SUBMISSION
CHEMICALS: 101101 Metribuzin

ID#: 101101-

COMPANY:

PRODUCT MANAGER: 71 WALTER WALDROP

703-308-8062 ROOM: CS1 3B3

PM TEAM REVIEWER: ERIC FERIS

703-308-8048 ROOM: CS1 3G5

RECEIVED DATE: 08/12/92 DUE OUT DATE: 11/10/92

* * * DATA PACKAGE INFORMATION * * *

DP BARCODE: 181718 EXPEDITE: N DATE SENT: 08/19/92 DATE RET.: 10/05/92

CHEMICAL: 101101 Metribuzin

DP TYPE: 001 Submission Related Data Package

ADMIN DUE DATE: 11/17/92

CSF: N

LABEL: N

ASSIGNED TO	DATE IN	DATE OUT
DIV : EFED	08/24/92	10/05/92
BRAN: EEB	08/24/92	10/05/92
SECT: IO	08/24/92	10/05/92
REVR :	/ /	/ /
CONTR:	/ /	/ /

* * * DATA REVIEW INSTRUCTIONS * * *

LIST A REREGISTRATION CHEMICAL

This is the Tier II Aquatic Plant Growth data for
METRIBUZIN. (MRID 42438301.) Two other Tier II phytotox
studies should be in any day now. Please review data.

Thanks.

* * * ADDITIONAL DATA PACKAGES FOR THIS SUBMISSION * * *

DP BC	BRANCH/SECTION	DATE OUT	DUE BACK	INS	CSF	LABEL
181728	RSCB/RS-2	08/19/92	11/17/92	Y	N	N

2

100.0 Pesticide Name: Metribuzin

103.0 Submission Purpose:

 Submission of aquatic plant growth and reproduction study
 (Tier II)

101.0 Chemical and Physical Properties:

101.1 Common Name:

 Metribuzin

101.2 Chemical Name:

 (4-amino-6-(1,1-dimethylethyl)-3-(methylthio)-1,2,4-
 triazin-5(4H)-one)

103.0 Toxicological Properties:

 5-day green algae (selenastrum capricornutum) study

105.0 Conclusions:

Green Algae

 This study is not scientifically sound and does not meet
 the guideline requirements for a Tier 2 nontarget aquatic
 plant study. The control cultures did not grow
 logarithmically. Based on initial measured
 concentrations, the 5-day NOEC, LOEC, and EC₅₀ for S.
 capricornutum exposed to metribuzin were 37, 60, and 137
 ug a.i./l, respectively.


Curtis E. Laird 11-18-92
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Ecological Effects Branch
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Norman J. Cook 01-12-93
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Anthony Maciorowski 01-21-93
Anthony Maciorowski, Chief
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DATA EVALUATION RECORD

1. **CHEMICAL:** Metribuzin.
Shaughnessey No. 101101.
2. **TEST MATERIAL:** Sencor technical; (4-amino-6-(1,1-dimethylethyl)-3-(methylthio)-1,2,4-triazin-5(4H)-one); CAS No. 21087-64-9; Batch No. 0145346/0030147; 93% active ingredient; a white powder.
3. **STUDY TYPE:** 123-2. Growth and Reproduction of Aquatic Plants - Tier 2. Species Tested: *Selenastrum capricornutum*.
4. **CITATION:** Gagliano, G.G. and L.M. Bowers. 1992. Acute Toxicity of SENCOR Technical to the Green Alga (*Selenastrum capricornutum*). Report No. 103239. Conducted by Miles Incorporated, Stilwell, KS. Submitted by Miles Incorporated, Kansas City, MO. EPA MRID No. 424383-01.
5. **REVIEWED BY:**

Mark A. Mossler, M.S. Agronomist KBN Engineering and Applied Sciences, Inc.	Signature:  Date: 10/26/92
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6. **APPROVED BY:**

Pim Kosalwat, Ph.D. Senior Scientist KBN Engineering and Applied Sciences, Inc.	Signature: P. Kosalwat Date: 10/26/92
Henry T. Craven, M.S. Supervisor, EEB/EFED USEPA	Signature: C.E.L. 11-18-92 Date: 
7. **CONCLUSIONS:** This study is not scientifically sound and does not meet the guideline requirements for a Tier 2 non-target aquatic plant study. The control cultures did not grow logarithmically. Based on initial measured concentrations, the 5-day NOEC, LOEC, and EC₅₀ for *S. capricornutum* exposed to metribuzin were 37, 60, and 137 µg ai/l, respectively.
8. **RECOMMENDATIONS:** N/A.

9. BACKGROUND:

10. DISCUSSION OF INDIVIDUAL TESTS: N/A.

11. MATERIALS AND METHODS:

A. Test Species: The alga used in the test, *Selenastrum capricornutum*, came from laboratory stock cultures originally obtained from Carolina Biological Supply, Burlington, NC. Stock cultures were maintained in algal nutrient medium (ASM-1) under 18 hours of light/day.

B. Test System: Test vessels used were sterile 125-ml glass flasks fitted with steel caps. The test medium was the same as that used for culturing.

The test vessels were randomly placed on a shaker table (104 rpm) in an environmental chamber. Continuous cool-white illumination (800-1000 footcandles) was provided and the temperature was monitored in a centrally located flask filled with 50 ml of medium.

A 1.076 g active ingredient (ai)/l stock was prepared by dissolving 0.0546 g of the test material in 50 ml of dimethylformamide (DMF). Test solutions were created by addition of appropriate volumes of the stock to nutrient medium. The solvent control contained 0.5 ml of DMF/l of nutrient medium, the same amount of solvent used in all test solutions.

C. Dosage: Five-day growth and reproduction test. Based on the results of a preliminary test, five nominal concentrations of 32, 63, 125, 250, and 500 $\mu\text{g ai/l}$, and a solvent and medium control were selected for the definitive test.

D. Test Design: Fifty ml of the appropriate test or control solution were placed into each of three replicate flasks (3 per treatment level and the controls).

An inoculum of cells calculated to provide 10,000 cells/ml was introduced into each flask. Cell counts were performed using a microscope and hemocytometer on each test day. Two hemocytometers per replicate flask were prepared and eight random fields were enumerated for each hemocytometer.

Samples were taken at test initiation before algal inoculum for analysis of the test material by high pressure liquid chromatography.

- E. **Statistics:** All calculations were based on initial measured concentrations. Control data were pooled. The EC₅₀ and associated 95% confidence interval (C.I.) were determined using nonlinear regression of percent inhibition data. The no-observed-effect concentration (NOEC) was estimated using analysis of variance (ANOVA) and Dunnett's test. The level of significance was $p \leq 0.05$.

12. **REPORTED RESULTS:** The initial measured concentrations ranged from 96 to 115% of nominal. The concentrations were 37, 60.4, 121, 257, and 500 $\mu\text{g ai/l}$. No undissolved test material was observed in the test solutions.

Cell counts and percent inhibition for each concentration after five days are given in Table 5 (attached). The 5-day EC₂₅ was 60 $\mu\text{g ai/l}$ (95% C.I. = 45-74 $\mu\text{g ai/l}$) and the 5-day EC₅₀ was 137 $\mu\text{g ai/l}$ (95% C.I. = 114-159 $\mu\text{g ai/l}$). The NOEC was determined to be 37 $\mu\text{g ai/l}$.

The pH was 7.5 for all solutions at test initiation and ranged from 7.2 to 7.4 at test termination. Temperature ranged from 23.8 to 25.3°C during the study.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:**
No conclusions were made by the authors.

Good Laboratory Practice and Quality Assurance statements were included in the report indicating compliance with EPA Good Laboratory Practice Standards, 40 CFR Part 160.

14. **REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS:**

- A. **Test Procedure:** The test procedure and the report did not follow the SEP and Subdivision J guidelines, and the following deviations were noted:

The age of the culture used as inoculum was not reported.

The light intensity (8.6-10.8 klux) was higher than recommended (4 klux).

The amount of cellular inoculum (10,000 cells/ml) was greater than recommended (3000 cells/ml).

Measured concentrations in Table 5 were incorrectly reported as ppm, rather than ppb.

- B. Statistical Analysis: Using the EPA's Toxanal and Dunnett's test programs, the reviewer confirmed the EC₅₀ and NOEC values, respectively. The lowest-observed-effect concentration (LOEC) was also determined. The results are similar to those of the authors (see attached printouts).
- C. Discussion/Results: Cellular growth of the pooled control only increased by approximately eight-fold. This may have been an indication that the light intensity was damaging to the cultures or that the culture used as inoculum was old or unhealthy. Average cell growth over a 5-day period is typically at least 100-fold the original density or greater.

This study is not scientifically sound and does not meet the guideline requirements for a Tier 2 non-target aquatic plant study. Based on initial measured concentrations, the 5-day NOEC, LOEC, and EC₅₀ for *S. capricornutum* exposed to metribuzin were 37, 60, and 137 µg ai/l, respectively.

- D. Adequacy of the Study:
 - (1) Classification: Invalid.
 - (2) Rationale: The control cultures did not grow logarithmically.
 - (3) Repairability: No.

15. COMPLETION OF ONE-LINER: Yes, 10-16-92.

Metribuzin

Page 8 is not included in this copy.

Pages _____ through _____ are not included.

The material not included contains the following type of information:

- ☐ Identity of product inert ingredients.
- ☐ Identity of product impurities.
- ☐ Description of the product manufacturing process.
- ☐ Description of quality control procedures.
- ☐ Identity of the source of product ingredients.
- ☐ Sales or other commercial/financial information.
- ☐ A draft product label.
- ☐ The product confidential statement of formula.
- ☐ Information about a pending registration action.
- ☒ FIFRA registration data.
- ☐ The document is a duplicate of page(s) _____.
- ☐ The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

Selenastrum cell density

Summary Statistics and ANOVA

Transformation = None

Group	n	Mean	s.d.	cv%
<i>Concentration (µg ai/l*)</i>				
1 = control	6	77333.3333	12754.0843	16.5
2 37	3	69333.3333	5686.2407	8.2
3* 66.4	3	55000.0000	6082.7625	11.1
4* 121	3	41000.0000	10000.0000	24.4
5* 257	3	24333.3333	1527.5252	6.3
6* 500	3	12000.0000	2000.0000	16.7

NOEC = 37 µg ai/l
LOEC = 60.4 µg ai/l

*) the mean for this group is significantly less than the control mean at alpha = 0.05 (1-sided) by a t - test with Bonferroni adjustment of alpha level

ie, initial measured conc.

Minumum detectable difference for
t-tests with Bonferroni adjustment = -13242.773965
This difference corresponds to -17.12 percent of control

*
* Note - the above value for the minimum
* detectable difference is approximate as
* the sample sizes are not the same for all of
* the groups.
*

Between groups sum of squares =***** with 5 degrees of freedom.
Error mean square = 77644444.444444 with 15 degrees of freedom.
Bartlett's test p-value for equality of variances = .067

MOSSLER METRIBUZIN SELENASTRUM CAPRICORNUTUM 10-16-92

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
500	100	84	84	0
257	100	69	69	0
121	100	47	47	0
60.4	100	29	29	0
37	100	10	10	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 133.8033

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS
4	2.797622E-02	136.2697	117.9359 158.1348

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
3	2.861958E-02	1	.4781742

SLOPE = 1.885166
95 PERCENT CONFIDENCE LIMITS = 1.566246 AND 2.204085

LC50 = 139.2475
95 PERCENT CONFIDENCE LIMITS = 119.9056 AND 162.3875

LC10 = 29.51934
95 PERCENT CONFIDENCE LIMITS = 20.95988 AND 38.10171
