MRID No. 414881-10

DATA EVALUATION RECORD

1. **CHEMICAL:** Mepiquat Chloride
Shaughnessey No. 109101

2. **TEST MATERIAL:** BAS 083W Technical; Lot No. OG 022; 47.0% active ingredient; CAS No. 24307-26-4; a liquid.

3. **STUDY TYPE:** Growth and Reproduction of Aquatic Plants -- Tier 1. Species Tested: Selenastrum capricornutum.

4. **CITATION:** Hughes, J.S. 1989. The Toxicity of BAS 083W to Selenastrum capricornutum. Laboratory Project ID 0445-03-1100-1. Conducted by Malcolm Pirnie, Inc., Elmsford, NY. Submitted by BASF Corporation, Research Triangle Park, NC. EPA MRID No. 414881-10.

5. **REVIEWED BY:**

Louis M. Rifici, M.S.
Associate Scientist II
KBN Engineering and
Applied Sciences, Inc.

Signature: Louis M Rifici
Date: 3/5/91

Chuck Lew
6/24/91

6. **APPROVED BY:**

Pim Kosalwat, Ph.D.
Senior Scientist
KBN Engineering and
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Signature: P. Kosalwat
Date: 3/5/91

Renée Lamb 4/4/91

Henry T. Craven, M.S.
Supervisor, EEB/HED
USEPA

Signature: Henry Craven
Date: 6/24/91

7. **CONCLUSIONS:** This study is scientifically sound and meets the guideline requirements for a Tier 1 non-target plant growth and reproduction test. Growth of Selenastrum capricornutum was enhanced by exposure to BAS 083W, though not significantly. BAS 083W would not be expected to have a detrimental effect on Selenastrum capricornutum when applied at the maximum label rate of 0.25 lb a.i./acre (184 µg a.i./L) and Tier 2 testing is not required.

8. **RECOMMENDATIONS:** N/A

9. **BACKGROUND:**

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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 the University of Texas Culture Collection, Austin, TX. Stock cultures were maintained in synthetic algal assay procedure nutrient medium (AAP; Miller et al., 1978) under 4306 ±646 lumens/m^2 (1 lumen/m^2 = 1 lux) illumination, and a temperature of 24°±2°C. Cool-white fluorescent lights and a continuous photoperiod were used. The culture flasks were shaken continuously at 100 oscillations per minute. Transfers were made into fresh medium to provide six to eight-day old cultures. The culture used as inoculum for the test was 8-days old.

B. **Test System:** All glassware was cleaned according to EPA methods and autoclaved before use. Test vessels used were 250-mL Erlenmeyer flasks fitted with foam stoppers which permitted gas exchange. The test medium was the same as that used for culturing with the pH adjusted to 7.5 ±0.1.

The test vessels were kept in an incubator with environmental conditions like those employed in culturing.

C. **Dosage:** Five-day growth and reproduction test. For a Tier 1 test, one concentration (200 µg a.i./L) and a control were used.

D. **Test Design:** A 20 mg a.i./L stock was prepared by diluting 10.6 mg of BAS 083W Technical to 250 mL in ASTM Type I water. No precipitates were observed in the stock solution. The test concentration was prepared by diluting 2.5 mL of the stock solution to 250 mL in sterile medium. Fifty mL of the test solution or medium were placed into each of three replicate 250-mL flasks (3 per treatment level and the control).

An inoculum of Selenastrum capricornutum cells calculated to provide 0.3 x 10^4 cells/mL was aseptically introduced into each flask. The inoculum volume was 0.100 mL per flask. The flasks were randomly repositioned each working day to minimize spatial differences in the incubator. Cell counts were performed using an electronic particle counter on test

days 2, 3, 4, and 7. Three counts per replicate, using sample volumes of 0.1 to 2.0 mL, were used on each counting day.

Samples of the test solutions were collected on day 0 and day 7 and sent to the registrant for determination of the actual concentration. The sample taken at test termination was filtered through a 0.8-µm filter and placed in a glass bottle prior to shipment. Only the control was sampled on day 7.

The pH was measured at test initiation and termination.

E. **Statistics:** T-tests were performed using SAS software. Mean cell counts of the control and the exposure concentration were compared to determine significant differences.

12. **REPORTED RESULTS:** Standing crops for the control and exposure concentration after seven days are given in Table 2 (attached).

Exposure to 200 µg/L caused a 1.7% stimulation in Selenastrum capricornutum growth in 7 days compared to the control. This cell growth was not significantly different from growth in the control.

The pH in the control and the exposure concentration were 7.5 to 7.8 and 7.1 to 7.95, respectively.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:** The author concluded that Tier 2 testing was unnecessary.

Good laboratory practice statements were included in the report indicating compliance with EPA Good Laboratory Practice Standards, 40 CFR Part 160, under the Federal Insecticide, Fungicide, and Rodenticide Act.

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

A. **Test Procedure:** The test procedure and the report were generally in accordance with the SEP and Subdivision J guidelines, except for the following deviations:

The dissolved oxygen and conductivity of the test solutions were not measured.

Light intensity during the test was 4.306 klux. The recommended light intensity is 4 klux.

The temperature in the incubator was given as 24°±2°C. The report did not state whether the temperature was measured during the test period or, if measured, what the results were.

Cell growth measurements were not taken daily. Measurements were made on days 2, 3, 4, and 7 only.

B. **Statistical Analysis:** The reviewer used a computer program (Minitab Version 7.1) to perform a t-test with the growth data (see attached printout). The cell growth in the exposure concentration was 1.67% higher than the medium control; this difference was not found significant by t-test (P = 0.45).

C. **Discussion/Results:** For a reason unknown to the reviewer, the results of the quantification of BAS 083W Technical in the test solutions were not included in the report.

This study is scientifically sound and meets the guideline requirements for a Tier 1 non-target aquatic plant study. Growth of Selenastrum capricornutum was enhanced by exposure to BAS 083W, though not significantly. BAS 083W would not be expected to have a detrimental effect on Selenastrum capricornutum when applied at the maximum label rate of 0.25 lb a.i./acre (184 µg a.i./L) and Tier 2 testing is not required.

D. **Adequacy of the Study:**

(1) Classification: Core

(2) Rationale: N/A

(3) Repairability: N/A

15. **COMPLETION OF ONE-LINER:** Yes, 2/26/91.

MALCOLM PIRNIE

BASF CORPORATION

BAS 0B3W TECHNICAL
Selenastrum capricornutum TOXICITY TEST

Table 2. Cell counts* (cells/mL) during assay

Nominal Concentration, ug/L		Day 2 1-26-89	Day 3 1-27-89	Day 4 1-28-89	Day 7 1-31-89
0	A	33,000	98,000	648,000	12,480,000
	B	30,000	115,000	892,000	12,800,000
	C	27,000	94,000	748,000	12,920,000
	Mean	30,000	102,333	762,667	12,733,333
	SD[1]	3.00E+03	1.12E+04	1.23E+05	2.27E+05
	Var[2]	9.00E+06	1.24E+08	1.50E+10	5.17E+10
200	A	28,000	99,000	752,000	12,800,000
	B	32,000	102,000	916,000	12,640,000
	C	34,000	105,000	880,000	13,400,000
	Mean	31,333	102,000	849,333	12,946,667
	SD	3.06E+03	3.00E+03	8.62E+04	4.01E+05
	Var	9.33E+06	9.00E+06	7.43E+09	1.61E+11

* Each value represents the mean of three sample counts

[1] SD = standard deviation

[2] Var = variance

LB 2/22/91

414881-10 Selenastrum capricornutum control growth vs exposure growth

	N	MEAN	MEDIAN	TRMEAN	STDEV	SEMEAN
control	3	12733	12800	12733	227	131

	MIN	MAX	Q1	Q3
control	12480	12920	12480	12920

TEST OF MU = 12733.000 VS MU Not Equal to 12733.000

	N	MEAN	STDEV	SE MEAN	T	P VALUE
exposure	3	12946.667	400.666	231.325	0.92	0.45