

US EPA ARCHIVE DOCUMENT

MRID No. 448065-03

**DATA EVALUATION RECORD  
AQUATIC PLANT EC<sub>50</sub> TEST  
GUIDELINE 123-2 (TIER II)**

1. **CHEMICAL:** Captan PC Code No.: 081301  
2. **TEST MATERIAL:** Captan technical Purity: 99.8%

**3. CITATION:**Authors:K.R. Drottar and H.O. KruegerTitle:Captan: A 7-Day Toxicity Test with Duckweed (*Lemna gibba* G3)Study Completion Date:April 14, 1999Laboratory:Wildlife International Ltd., Easton, MDSponsor:Captan Stewardship Task Force - Tomen Agro, Inc., San Francisco, CA, and  
Makhteshim-Agan of North America, Inc., New York, NYLaboratory Report ID:493A-103DP Barcode: D255807MRID No.: 448065-03

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

**Signature:****Date:**

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

**Signature:****Date:**

5. **APPROVED BY:** Brian Montague, Fisheries Biologist

**Signature:****Date:**Oct. 29, 1999

6. **STUDY PARAMETER:** **Definitive Test Duration:** 7 days  
**Type of Concentrations:** Initial measured

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements for an acute aquatic plant study. 4 to 18% cell density reduction was observed at dose levels above 0.4 ppm, but was not dose consistent. Classification is **Core**.

**Results Synopsis:**EC<sub>50</sub>: >12.7 ppm ai

95% C.I.: N/A

NOEC: 0.4 ppm ai

Probit Slope: N/A

8. **ADEQUACY OF THE STUDY:**

A. **Classification:** CoreB. **Rationale:** N/AC. **Repairability:** N/A

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**9. GUIDELINE DEVIATIONS:**

- The test length (7 days) was less than recommended (14 days).

**10. SUBMISSION PURPOSE:** Submitted to support captan use in areas where exposure to aquatic habitats is expected.

**11. MATERIALS AND METHODS:****A. Test Organisms**

Guideline Criteria	Reported Information
<b>Species</b> <i>Lemna gibba</i>	<i>Lemna gibba</i>
<b>Number of Plants/Fronds</b> 5 plants, 3 fronds per plant.	5 plants per replicate with 3 fronds each
<b>Nutrients</b> Standard formula, e.g. 20X-AAP	M-Hoagland's medium without sucrose or EDTA

**B. Test System**

Guideline Criteria	Reported Information
<b>Solvent</b>	DMF (0.1 mL/L)
<b>Temperature</b> 25°C	23.6 - 24.6°C
<b>Light Intensity</b> 5.0 Klux (±15%)	4.3 - 4.9 Klux
<b>Photoperiod</b> Continuous	Continuous
<b>pH</b> Approximately 5.0	4.8 - 5.6
<b>Test System</b> Static or renewal	Static

**C. Test Design**

Guideline Criteria	Reported Information
<b>Dose range</b> 2X or 3X progression	2X
<b>Doses</b>	0.63, 1.3, 2.5, 5.0, and 10 mg active ingredient (ai)/L

Guideline Criteria	Reported Information
at least 5	
<b>Controls</b> negative and/or solvent	Negative and solvent control
<b>Replicates per dose</b> 3 or more	3 replicates
<b>Duration of test</b> 14 days	7 days
<b>Daily observations</b> were made?	Observations made on Days 3, 5, and 7.
<b>Method of Observations</b>	FronD counts
<b>Maximum Labeled Rate</b>	Not reported

**12. REPORTED RESULTS:**

Guideline Criteria	Reported Information
<b>Initial and terminal day frond count?</b>	Yes
<b>Control frond count at termination <math>\geq 2X</math> initial count?</b>	Yes
<b>Initial chemical concentrations measured?</b> (Optional)	Yes, values were 70-127% of nominal, procedural recovery was 108%, and the LOQ was 0.251 ppm ai
<b>Raw data included?</b>	Yes

**Dose Response - Frond Count**

Initial Measured Concentration (mg ai/L)	Mean Frond Number	% Inhibition <sup>a</sup>	Day 7 pH values
Control	173	--	5.6
Solvent Control	166	--	5.6
0.4	166	0	5.6
1.1	136	18	5.6
2.7	151	9	5.6
5.9	139	16	5.6
12.7	160	4	5.5

<sup>a</sup>compared to the solvent control

Other Significant Results: Fronds in the highest replicate were noted as having smaller fronds and affected roots.

Statistical Results

Statistical Method: Visual interpretation was used to estimate the EC<sub>50</sub> value and Bonferroni's test was used to determine the NOEC with respect to the pooled control data. Results were based on initial measured concentrations.

EC<sub>50</sub>: >12.7 ppm ai  
Probit Slope: N/A

95% C.I.: N/A  
NOEC: 2.7 ppm ai

**13. VERIFICATION OF STATISTICAL RESULTS:**

Statistical Method: The EC<sub>50</sub> could not be calculated. Williams' test was used for mean comparisons versus the solvent control.

EC<sub>50</sub>: >12.7 ppm ai  
Probit Slope: N/A

95% C.I.: N/A  
NOEC: 0.4 ppm ai

- 14. REVIEWER'S COMMENTS:** The reported water solubility of captan technical was 5.1 ppm. Additionally, no maximum label rate was reported. However, water concentration of 12,000 ppb would not be expected with presently labeled use rates. With the consideration that 12.7 ppm ai is above the maximum water solubility without a solvent, this study is scientifically sound and fulfills the guideline requirements for an aquatic plant toxicity study. Based on initial measured concentrations, the 7-day EC<sub>50</sub> for *Lemna gibba* exposed to captan was >12.7 ppm ai. The NOEC was determined to be 0.4 ppm ai. This study is classified as **Core**.

Lemna frond number

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WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION		ORIGINAL N	MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	Sol. Con.	3	165.667		165.667	165.667
2	0.4 ppm ai	3	165.667		165.667	165.667
3	1.1 ppm ai	3	135.667		135.667	146.333
4	2.7 ppm ai	3	150.667		150.667	146.333
5	5.9 ppm ai	3	139.000		139.000	146.333
6	12.7 ppm ai	3	160.000		160.000	146.333

Lemna frond number

File: lem Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. MEAN	SIG WILLIAMS	TABLE P=.05	DEGREES OF WILLIAMS	FREEDOM
Sol. Con.	165.667					
0.4 ppm ai	165.667	0.000		1.78	k= 1, v=12	
1.1 ppm ai	146.333	2.257	*	1.87	k= 2, v=12	
2.7 ppm ai	146.333	2.257	*	1.90	k= 3, v=12	
5.9 ppm ai	146.333	2.257	*	1.92	k= 4, v=12	
12.7 ppm ai	146.333	2.257	*	1.93	k= 5, v=12	

s = 10.491

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