DATA EVALUATION RECORD
AQUATIC PLANT EC_{50} 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 qnd H.O. Krueger
Title:Captan: A 7-Day Toxicity Test with Duckweed (*Lemna gibba* G3)
Study Completion Date:April 14, 1999
Laboratory:Wildlife International Ltd., Easton, MD
Sponsor:Captan Stewardship Task Force - Tomen Agro, Inc., San Francisco, CA, and Makhteshim-Agan of North America, Inc., New York, NY
Laboratory Report ID:493A-103
DP Barcode: D255807
MRID 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:** **DefinitiveTest 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_{50}: >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: Core
B. Rationale: N/A
C. Repairability: N/A

9. GUIDELINE DEVIATIONS:

1. 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
Species *Lemna gibba*	*Lemna gibba*
Number of Plants/Fronds 5 plants, 3 fronds per plant.	5 plants per replicate with 3 fronds each
Nutrients Standard formula, e.g. 20X-AAP	M-Hoagland's medium without sucrose or EDTA

B. Test System

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

C. Test Design

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

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

12. REPORTED RESULTS:

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

Dose Response - Frond Count

Initial Measured Concentration (mg ai/L)	Mean Frond Number	% Inhibition[a]	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

[a]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_{50} 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_{50}: >12.7 ppm ai	95% C.I.: N/A
Probit Slope: N/A	NOEC: 2.7 ppm ai

13. VERIFICATION OF STATISTICAL RESULTS:

Statistical Method: The EC_{50} could not be calculated. Williams' test was used for mean comparisons versus the solvent control.

EC_{50}: >12.7 ppm ai	95% C.I.: N/A
Probit Slope: 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_{50} 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
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	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. WILLIAMS	SIG	TABLE WILLIAMS P=.05	DEGREES OF 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.