

US EPA ARCHIVE DOCUMENT

5-4-87

CASE GS _____ PM ____/____/____

CHEM Diazinon

BRANCH EEB DISC _____

FORMULATION technical, 92.5% ai diazinon

FICHE/MASTER ID ROODI007

CITATION: Allison, D.T.; Hermanutz, D.T. (1977) Toxicity of diazinon to Brook Trout and Fathead Minnows. U.S. EPA Environmental Research laboratory-Duluth, Office of Research and Development, Duluth, Minnesota, EPA-600/3-77-060.

SUBST. CLASS=

OTHER SUBJECT DESCRIPTORS
PRIM:

DIRECT REVIEW TIME= 1 week (MH) START DATE May 1986 END DATE May 1986

REVIEWED BY: *M* Margaret Rostker
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H.T. Craven
5/4/87

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TITLE: Supervisory Biologist
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5/4/87

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Submitted

1/4

DATA EVALUATION RECORD

1. Chemical: Diazinon
2. Test Material: Technical diazinon (92.5% ai).
3. Study Type: Chronic toxicity to Brook Trout and Fathead Minnows.
4. Study ID: Allison, D.T.; Hermanutz, R.O. (1977) Toxicity of diazinon to Brook Trout and Fathead Minnows. U.S. EPA, Environmental Research Laboratory-Duluth, Office of Research and Development, Duluth, Minnesota. EPA-600/3-77-060.

5. Reviewed by *ja* Margaret Rostker
Wildlife Biologist
EEB/HED

Signature: *H.T. Craven*
Date: *5/4/87*

6. Approved by: Harry Craven
Supervisory Biologist
EEB/HED

Signature:
Date: *H.T. Craven*
5/4/87

7. Conclusions:

Flow-through 96-hour LC₅₀ = 7.8 mg/L (ppm) for Fathead minnow; 1.6 mg/L for Flagfish; 0.77 mg/L for Brook Trout, and 0.46 mg/L for Bluegill Sunfish.

The study is sound and results are useful in hazard assessment. The study is classified as core.

8. Recommendations: N/A
9. Background: N/A
10. Discussion of Individual Test: N/A

11. Materials and Methods:

- a. Test Animals: All fish were obtained from laboratory stock or commercial hatcheries.
- b. Dose: All tests were flow-through; proportional diluters delivered five dose concentrations plus control water to duplicate exposure chambers in all tests.
- c. Design: 96-hour LC₅₀ Tests: Fathead minnows: 20 fish/concentration; five concentrations. 1-1, 2.1, 3.4, 6.0, 11.7 ppm (mg/L); Bluegill Sunfish: 20 fish/concentration; five concentrations: 0.04, 0.08, 0.22, 0.44, 0.89 ppm (mg/L); Brook Trout: 20 fish/concentration; five concentrations: 0.04, 0.08, 0.16, 0.39, 0.92 ppm (mg/L); Flagfish: 40 fish/concentration; five concentrations: 0.2, 0.36, 0.82, 1.6, 3.1 ppm (mg/L).

Chronic Test: Fathead Minnows: 50 fish/concentration; five concentrations: 69, 118, 229, 511, 1099 ug/L (ppb); Brook Trout: 6 fish/concentration; five concentrations: 0.55, 1.1, 2.4, 4.8, 9.6 ug/L (ppb).
- d. Statistics: 96-hour LC₅₀'s calculated with methods described by Litchfield and Wilcoxon. Chronic tests analysed with one-way analysis of variance and Dunnett's comparison of means.

12. Reported Results:

Average 96-hour LC₅₀'s for diazinon under flow-through conditions were 7.8, 1.6, 0.77, and 0.46 mg/L, respectively, for fathead minnows, flagfish, brook trout, and bluegills.

The chronic effects of diazinon on fathead minnows and brook trout were determined in flow-through systems with constant toxicant concentrations. Fathead minnows exposed to the lowest concentration tested (3.2 ug/L) from 5 days after hatch through spawning had a significantly higher incidence of scoliosis than the control (P = 0.05). Hatch of their progeny was reduced by 30 percent at this concentration. Yearling brook trout exposed to 4.8 ug/L and above began developing scoliosis and lordosis within a few weeks. Growth of brook trout was substantially inhibited during the first 3 months at 4.8 ug/L and above. Neurological symptoms were evident in brook trout at 2.4 ug/L and above early in the tests, but were rarely observed after 4 or 5 months of exposure. Exposure of mature brook trout for 6 to 8 months to concentrations ranging from 9.6 ug/L to the

lowest tested (0.55 ug/L) resulted in equally reduced growth rates for their progeny. Transfer of progeny between concentrations indicated that effects noted for progeny of both species at lower concentrations were the result of parental exposure alone and not the exposure of progeny following fertilization.

13. Study Author's Conclusions/QA Measures:

See Reported Results.

14. Reviewer's Discussion and Interpretation of Study:

- a. Test Procedures: The procedures were in general conformance with guidelines.
- b. Statistical Analysis: The analysis was appropriate.
- c. Discussion/Results: See Reported Results.
- d. Adequacy of Study:

1. Classification: Core.
2. Rationale: Guidelines.
3. Repair: N/A.

Should be Supplemental

NO NOEC or LOEC determined

B. Montague

Brook Trout

LOEC 8 months less than 0.55 ug/L for B. trout growth effects