

US EPA ARCHIVE DOCUMENT

1-20-83

DATA EVALUATION RECORD

- 1. Chemical: Diazinon 2FM  
Microencapsulated
- 2. Formulation: Formulated Product  
Active Ingredient:  
0,0-Diethyl 0-(2-esopropyl-6-methyl-4-  
pyrimidinyl)phosphorothioate . . . . . 23%  
Inert Ingredients: . . . . . 77%
- 3. Citation: Application for Registration of Knox Out® Fire  
Ant Control Section IX; Fish and Wildlife Safety.  
(October 1982) Submitted by Agchem Division  
Pennwalt Corporation. (Accession No. 248821);  
Registration No. 4581-GLR
- 4. Reviewed by: Wayne C. Faatz, Ph.D.  
Wildlife Biologist
- 5. Date Reviewed: January 20, 1983
- 6. Test Type: Bluegill Sunfish Knox Out® 2FM Insecticide  
Concentration in Water

Union Carbide Environmental Service Report 11506-41-07.

This report is a supplement to the Data Evaluation Record by J. Leitzke September 11, 1980 on Fish Acute LC50: Bluegill Sunfish: Lepomis macrochirus Rafinesque, UCES Project No. 11506-41-07; Prepared by Union Carbide Environ. Serv.

The LC50 was determined using the formulated product, adjusted by EEB to nominal active ingredient. Microencapsulated diazinon is a time release insecticide so actual measured concentrations are necessary for the test to be meaningful. The measured concentrations of the toxicant in the original test were not available. EEB is willing to upgrade the aquatic study to acceptable if the toxicant concentrations of the original solutions were available if the toxicant concentrations of the original solutions were available or measurements of new prepared solutions are determined (Faatz August 24, 1981). The registrant chose the latter.

7. Reported Results:

The amount of total diazinon found in the water at 18 mg/L rate was 91 to 106 percent and in the 180 mg/L rate was 95 to 118 percent of what was added. Due to the technique in taking samples of water with suspended capsules

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and the extraction efficiency, these results fall within the accuracy of the analytical method. From 24 hours through 96 hours about 10 to 11 percent of the total diazinon added had been released from the capsules in the 180 mg/L rate. At the lower rate about 4% was released the first two days and increased to about 8 percent at 96 hours.

Concentration: 18 mg/L Knox Out 2FM

<u>Sampling Time (hr)</u>	<u>Added mg/L ai</u>	<u>Found mg/L Total</u>	<u>Released</u>	<u>% of Nominal</u>
0	4.15	4.42	0.06	1.4
24	4.15	3.78	0.17	4.1
48	4.15	4.27	0.18	4.3
96	4.15	3.80	0.35	8.4

Concentration: 180 mg/L Knox Out 2FM

<u>Sampling Time (hr)</u>	<u>Added mg/L ai</u>	<u>Found mg/L Total</u>	<u>Released</u>	<u>% of Nominal</u>
0	41.45	49.11	0.34	0.8
24	41.45	42.98	4.16	10.0
48	41.45	44.97	4.25	10.3
96	41.45	39.31	4.73	11.4

#### 8. Reviewer's Conclusions:

The registrant's conclusions adequately reflect the data presented. However, the registrant did an assay only on the highest and lowest concentrations used in the LC<sub>50</sub> test, not an assay of all test levels concentrations as requested. As would be expected under such circumstances the desorption rate of diazinon is not clearly evident. The data is sufficient for assessment purposes and upgraded the study to core status. However, the LC<sub>50</sub> must be adjusted to reflect the new data. The registrant reported an LC<sub>50</sub> of 26.6 (21.8 to 37.4) ppm with the formulated product; whereas, EEB calculated the LC<sub>50</sub> as 28.0 (21.4 to 36.6) ppm. EEB used its LC<sub>50</sub> value to calculate the nominal LC<sub>50</sub> for the ai. The 96 hour LC<sub>50</sub> based upon a 23 percent ai was 6.4 (4.9 to 8.4) ppm.

Since the product is microencapsulated, the pesticide is not immediately available. The data submitted by the registrant indicates that approximately 8 percent of the total diazinon is released into the water by 96 hours at

the 18 mg/L concentration. The 8 percent datum is used to calculate the LC<sub>50</sub> of the adjusted, nominal, ai because the 18 mg/L concentration is more representative than the higher concentration.

Therefore using the LC<sub>50</sub> of the ai calculated by EEB (6.4 (4.9-8.4) ppm), and taking 8 percent of these values which represents the available diazinon at the end of 96 hours yields an LC<sub>50</sub> .512 (.392 to .672) ppm for the bluegill sunfish. On this basis encapsulated diazinon can be considered very highly toxic to warmwater fish.

The data indicate also that the total amount of diazinon degrades little, if any, at the end of 96 hours.

This adjusted LC<sub>50</sub> will be noted in EEB's diazinon file and used in future assessments.

8. Materials and Methods:

Fifteen liters of soft water (hardness 50 mg/L as CaCO<sub>3</sub>, pH 7.2) were placed in two 5 gallons polyethylene buckets at a room temperature of 21° to 22 °C. Knox Out 2FM was added at 18 mg/L in one bucket and 180 mg/L in the other one. Samples were taken at intervals of 0, 24, 48, and 96 hours and the concentrations determined for total and release diazinon. Final quantitation was done using a Hewlett - Packard gas chromatograph equipped with a flame photometric detector. For the released diazinon the water subsamples were filtered through a 0.45 micron Millipore filter to remove all the capsules, then the filtered water was extracted.

9. Reviewer's Evaluation:

- a. Test Procedure: The test procedure was adequate for the intended purpose.
- b. Statistical Analysis: None was needed.
- c. Discussion/Results: The original bluegill study was unacceptable because the amount of diazinon available to the solution was unknown. This study can be considered acceptable but with a revised LC<sub>50</sub> .512 (.392 to .672) ppm which reflects the amount of active ingredient available to test test organism.
- d. Conclusions:
  1. Category: Core with acceptance of a revised LC<sub>50</sub> .512 (.392 to .672) ppm.
  2. Rationale: The assay measured the amount of diazinon in solution available to the test organisms.
  3. Repairability: N/A.