

US EPA ARCHIVE DOCUMENT

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EE BRANCH REVIEW

DATE: IN 01/08/80 OUT 02/19/80

FILE OR REG. NO. 264-330

PETITION OR (EXP. PERMIT NO.) 1016-78, 1016-80

DATE DIV. RECEIVED 01/07/80

DATE OF SUBMISSION 12/14/79

DATE SUBMISSION ACCEPTED _____

TYPE PRODUCT(S): I, D, H, F, (N), R, S Nematicide

DATA ACCESSION NO(S). 099120 (8F2107)

PRODUCT MGR. NO. 12

PRODUCT NAME(S) Temik[®]

COMPANY NAME Agricultural Products Co.

SUBMISSION PURPOSE Petition on grain sorghum

CHEMICAL & FORMULATION 2-methyl-(methylthio)propionaldehyde
Aldicarb: 0-(methyl carbamoyl)oxime

Tech. a.i. 100%

103.1 Mammal

See review by J. Edmondson - 8/7/74

103.1.2 Bird

See review by L. Turner - 5/18/78

103.1.3 Fish

See review by R. Felthousen - 4/9/77

103.1.4 Aquatic Invertebrates

See review by L. Turner - 5/18/78

103.1.5 Phytotoxicity

See review by L. Turner - 5/18/78

103.1.6 Beneficial Insects

See review by L. Turner - 5/18/78

103.2 Subacute Toxicity

103.2.1 Mammal

See review by R. Felthousen - 4/9/77

103.2.2 Bird

See reviews by R. Felthousen - 4/9/77, and L. Turner - 5/18/78

103.5 Field Studies

See reviews by R. Felthousen - 4/9/77, and L. Turner - 5/18/78

104.0 Hazard Assessment

See reviews from R. Felthousen (4/9/77, 7/6/77, 1/19/79),
L. Turner (5/18/78), and R. Matheny (9/24/79).

104.1.3 Adequacy of Toxicity Data

The following studies satisfy regulatory requirements for
registration:

1. Avian subacute dietary LC₅₀ waterfowl.

2. Aquatic invertebrate 48-hour LC₅₀.
3. Avian acute oral LD₅₀ for mallard ducks.
4. Avian subacute dietary LC₅₀ for bobwhite quail.

Within Accession Number 099120, the registrant has submitted the four following studies:

1. Avian acute oral LD₅₀ for mallard ducks.
2. Avian subacute dietary LC₅₀ for bobwhite quail.
3. Fish acute 96 LC₅₀ - warm-water species (bluegill sunfish).
4. Fish acute 96-hour LC₅₀ - cold-water fish species (rainbow trout).

The avian studies were previously reviewed by R. Matheny - 9/24/79.

The fish studied which have been validated produced the following results:

<u>Species</u>	<u>Test</u>	<u>Results</u>	<u>Status</u>
Rainbow Trout	96-hr. LC ₅₀	LC ₅₀ - .56 ppm 95% C.I. (.47-.68 ppm)	Core
Bluegill Sunfish	96-hr. LC ₅₀	LC ₅₀ 63.3 ppb 95% C.I. (52.2 - 76.7 ppb)	Invalid

105.0 Classification

See R. Felthousen's review - 1/19/79.

106.0 RPAR Criteria

See R. Felthousen's review - 1/19/79.

107.0 Conclusions

107.4 Data Adequacy

The test results on the bluegill sunfish are invalid because it was not clear whether the mortality results were due only to the toxicant. Since the toxicant is a very highly toxic one, a valid test is necessary.

The rainbow trout LC_{50} is accepted as being valid with a cautionary note. The biological loading criteria were exceeded, but the control animals showed no deleterious effects. On this basis the test is considered valid.

Wayne C. Faatz Ph.D.

Wayne C. Faatz, Ph.D.
Wildlife Biologist

Raymond W. Matheny 2/22/80

Raymond W. Matheny
Section I Head

Clayton Bushong 2/25/80

Clayton Bushong
Chief, EEB

Data Evaluation Record

1. Chemical: Aldicarb
2. Formulation: Technical Grade 100%
3. Citation: Hutchinson, C. (1979) Aldicarb Fish and Wildlife Studies. Union Carbide Corp. Environ. Ser. Tarrytown Technical Center. Tarrytown, New York 10591.
UCES Proj. No.: 11504-14-04
Within Accession No. 099120)
4. Reviewed by: Wayne C. Faatz, Ph.D.
Wildlife Biologist
EEB/HED
5. Date Reviewed: February 13, 1980
6. Test Type: 96-hour LC₅₀ - warm-water species
 - A. Test Species: Blue Gill (Lepomis macrochirus)
7. Reported Results: The 96-hour LC₅₀ (Spearman-Kärber Estimator) for the blue gill sunfish is 63.3 ug/l with the 95% confidence interval being 52.2 - 76.7 ug/l. The 96-hour no effect level was observed to be 32.0 ug/l.
8. Reviewer's Conclusions: The study is unacceptable because of the following conditions:
 1. The solvent control organisms were possibly stressed.
 2. Improper test procedures
 3. Poor dose response data

Material/Methods

A. Test Procedure:

The test procedure generally follows those outlined in the Toxicity Test with Aquatic Organisms (1975).

B. Statistical Analysis:

The Spearman-Kärber Estimator was used to evaluate the data and was a valid approach.

C. Discussion/Results:

The 96-hour LC_{50} is 63.3 ug/l, with the 95% C.L. being between 52.2 to 76.7 ug/l.

Reviewer's Evaluation

A. Test Procedure

Proper O_2 saturation levels were not maintained in the test levels and solvent control.

B. Statistical Analysis

The binomial test was used to analyze the data. The LC_{50} was 63.9 ug/l which is comparable to the reported LC_{50} of 63.3 ug/l. The 95% C.L. were not useable and could not be compared to the reported C.L. This discrepancy was due to the difference in the statistical tests. The statistical tests used were valid, but the soundness of the data base was questioned.

C. Discussion/Results:

The test results are considered unacceptable. The 48-hour oxygen concentration was below 60 percent saturation in the solvent control and the five test levels. In the latter 48 hours, the solvent control, the 32 ug/l, 56.0 ug/l, and 100 ug/l test levels were below the 40% O_2 saturation criteria. Also, the fish in the solvent control were exhibiting surfacing reactions, possibly indicating a stress reaction. It is plausible that the test organisms were also under stress from other sources beside the toxicant.

The dose response data showed a lack of continuity. There was a 10% mortality at the 10.0 ug/l test level with no mortality in the two following levels and mortality exhibited in the remaining levels.

The toxicant is a very highly toxic one, and because the data base can be seriously questioned as being valid, a complete evaluation cannot be made at this time.

D. Conclusions

1. Category: Invalid
2. Rationale:

The O₂ saturation were below established criteria, and the control organisms showed abnormal behavior. Also the response-dose lacks continuity.

Data Evaluation Record

1. Chemical: Aldicarb
2. Formulation: Technical Grade 100%
3. Citation: Hutchinson, C. (1979) Aldicarb Fish and Wildlife Studies. Union Carbide Corp. Environ. Ser. Tarrytown Technical Center. Tarrytown, New York 10591.
UCES Proj. No.: 11504-14-04
(Within Accession No. 099120)
4. Reviewed by: Wayne C. Faatz, Ph. D.
Wildlife Biologist
EEB/HED
5. Date Reviewed: February 15, 1980
6. Test Type: 96-hour - LC₅₀ cold-water species
 - A. Test Species: Rainbow Trout (Salmo gairdneri)
7. Reported Results: The 96-hour LC₅₀ is 0.56 mg/l with 95% confidence limits being 0.47 to 0.68 mg/l. The 96-hour no effect level is 0.18 mg/l.
8. Reviewer's Conclusions: This study is valid.

Material/Methods

A. Test Procedures

The test procedures followed those recommended by the Committee on Methods for Toxicity Test with Aquatic Organisms involving static tests.

B. Statistical Analysis

The Spearman-Kärber Estimator was used to evaluate the data and was a valid approach.

C. Discussion/Results

The 96-hour LC_{50} with 95% confidence limits for Aldicarb Technical to rainbow trout was 0.56 (0.47-0.68) mg/l. The 96-hour no effect level was 0.18 mg/l.

Reviewer's Evaluation

A. Test Procedures

The biological loading was 0.88 g/l exceeding the recommended 0.8 g/l. Since crowding could be a degrading factor beside the toxicant, the data base can be questioned. However, the control organisms showed no signs of stress or no mortality was exhibited, thus the test was considered valid.

B. Statistical Analysis

The binomial test was used to analyze the data. The LC_{50} was .56 mg/l which is the same as the reported LC_{50} of .56 mg/l. The 95% C.I. were not useable and could not be compared to the reported C.I. This discrepancy was due to the difference between the statistical tests.

C. Discussion/Results

The test was considered scientifically sound even though the biological loading exceeded established test criteria.

D. Conclusions

1. Category: Core

EEB/HED:WCFaatz:rfr331/pal:DCR#13770:RAVEN:479-2018:02/19/80