(TDR:3R) DATA EVALUATION RECORD PAGE 1 OF

CASE GS0140 ALDICARB PM 9/29/82

CHEM 098301

BRANCH EEB DISC TOPIC Special Order

FORMULATION 00 Active Ingredient

FICHE/MASTER ID 00053353 CONTENT CAT 01

Clarkson, V.A.; Henaley, W.H. (1968) Temik Insecticide: Toxicity of Temik, Temik sulfoxide and Temik sulfone to Bluegill Sunfish: Project No. 111B32. (Unpublished study received Jan 18, 1977 under 1016-EX-37; submitted by Union Carbide Corp., Arlington, Va.; COL:228975-C)

SUBST. CLASS # 5.

OTHER SUBJECT DESCRIPTORS
PRIM:
SEC:

DIRECT RVW TIME # (MM) START-DATE END DATE

REVIEWED BY: RICHARD R. STEVENS
TITLE: ECOLOGIST
ORG: EEB/HED
LOC/TEL:

SIGNATURE: Richard R. Stevens DATE: 4/4/84

APPROVED BY:
TITLE:
ORG:
LOC/TEL:

SIGNATURE: DATE:

DATA EVALUATION RECORD

CHEMICAL: Aldicarb, "purified grade"
Aldicarb sulfone, "purified grade"
Aldicarb sulfoxide, "95.4% purified grade"

CITATION: Clarkson, V.A.; Hensley, W.H. (1968) Temik Insecticide: Toxicity of Temik, Temik sulfoxide and Temik sulfone to Bluegill Sunfish: Project No. 111B32, (Unpublished study received Jan. 18, 1877 under 1016-EX-37; submitted by Union Carbide Corp., Arlington, Va.; CDL:228975-C) (00053353).

REVIEWED BY: Richard R. Stevens
Ecologist, EEB/HED
March 26, 1984

STUDY TYPE: Aquatic LC_{50}
Bluegill (Lepomis macrochirus)

RESULTS: The 72-hour LD_{50} values for Temik, Temik sulfoxice and Temik sulfone are 0.1, 4.0 and > 64 ppm respectively.

CONCLUSIONS: These results are satisfactory to demonstrate that aldicarb is highly toxic to bluegill. This study does not satisfy guideline requirements for a fresh-warmwater fish 96-hour LC_{50}.

Materials/Methods

Test Procedures

"Bluegill (Lepomis macrochirus) averaging approximately 2.7 inches in length and 5 g. in weight were selected from those seined from a farm pond at the Agricultural Research Station, Clayton, North Carolina. The fish were held in an aquarium 36" x 20" x 18" filled with pond water for a 24-hour acclimation period prior to being placed in cylindrical glass jars containing 2 liters of pond water each.

"Five fish, except as noted in the table, were placed in each of the 16 jars for two to four hours to determine possible injury resulting from transfer. transfer. Injured fish were replaced. The water in each jar and the aquarium was subject to constant aeration. The fish were fed Wardley's fish food daily.

"All test chemicals used in these experiments were purified grade. Fresh stock solutions of 10 percent acetone in water were made up for each test so that 10 cc. of the solution in 1 liter of water equaled the greatest concentration of chemical in any one test series. Lesser concentrations of chemical were obtained by addition of appropriately smaller quantities of stock solution. Each treatment was replicated four times.

"Frequent observations were made to determine the deaths during each 24 hours as shown in the table. Dead fish were removed and destroyed. Notes were made as to symptoms of sublethal toxicity. No fish were used in the untreated control. Water temparature was held at approximately 72 F. during the experiments."

Statistical Procedures

"LD_{50} values were estimated from an eyefit curve of the mortalities plotted on log-probit paper from the data."

Reported Results

The 72-hour LD_{50} of Temik, Temik sulfone and Temik sulfoxide to Bluegill as determined by the data in Table 1 are 0.1, 4.0 and > 64 ppm respectively.

Reviewers Evaluation

Validation Category: Supplemental

Category Rationale: The following limitations in the study were noted.

1. The study was not run for a full 96-hours.
2. Percent active ingredient was not specified in all cases.
3. No statistical analysis was performed. However, statistical verification of the data in EEB resulted in an LC_{50} (with 95% C.L.) of 0.122(0.102 - 0.161) ppm by probit for Temik.

Category Repairbility: N/A

(3)

TABLE I

THE TOXICITY OF TEMIK AND ITS CARBAMATE METABOLITES TO BLUEGILL

Compound	Concentration ppm	Mortality 24 hr.	48 hr.	72 hr.	% Kill 72 hr.
TEMIK[3]	1	20/20	20/20	20/20	100
	0.5	7/7	7/7	7/7[1]	100
	0.25	4/4	4/4	4/4[1]	100
	0.125	5/20	9/20	10/20	50
	0.063	0/20	1/20	1/20	5
	0.031	0/20	0/20	0/20	0
Control	---	0/20	0/20	0/20	0
TEMIK sulfoxide[4]	16	20/20	20/20	20/20	100
	8	20/20	20/20	20/20	100
	6	17/20	17/20	17/20	85
	4	12/20	13/20	13/20	65
	2	1/20	1/20	1/20	5
	1	0/20	0/20	0/20	0
Control	---	0/20	0/20	0/20	0
TEMIK sulfone[5]	64	1/20	---[2]	4/20	20
	48	0/20	-----	2/20	10
	32	0/20	-----	1/20	5
	16	0/20	-----	0/20	0
	8	0/20	-----	0/20	0
Control	---	0/20	-----	0/20	0

1. From separate range-finding study.
2. No determinations were made.
3. TEMIK--purified grade, 414RD67.
4. Sulfoxide--95.4% purified grade, kept refrigerated.
5. Sulfone--purified grade.

ME ALDICARB FISH ACUTE LC50

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
1	20	20	100	9.53674E-05
.5	7	7	100	.78125
.25	4	4	100	6.25
.125	20	10	50	58.8098
.063	20	1	5	2.00272E-03
.031	20	0	0	9.53674E-05

THE BINOMIAL TEST SHOWS THAT .063 AND .5 CAN BE
USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS .125

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
5	.139187	.139672	.0881875	.196742

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
6	.282591	1	.99533

SLOPE = 5.96096
95 PERCENT CONFIDENCE LIMITS = 2.79215 AND 9.12976

LC50 = .122626
95 PERCENT CONFIDENCE LIMITS = .101926 AND .161483

LC10 = .0750812
95 PERCENT CONFIDENCE LIMITS = .0455768 AND .0919853

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