098301

(13)

EEE BRANCH REVIEW

DATE: IN 9/6/78 OUT 9/24/79 IN _____ OUT _____ IN _____ OUT _____

FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. 1016-80 78

PETITION OR EXP. PERMIT NO. 8F 2107

DATE DIV. RECEIVED August 14, 1978

DATE OF SUBMISSION July 1978

DATE SUBMISSION ACCEPTED _____

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

DATA ACCESSION NO(S). 091373, 096397, 096683, 096397

PRODUCT MGR. NO. 12

PRODUCT NAME(S) ALDICARB

COMPANY NAME Union Carbide

SUBMISSION PURPOSE Label Amendment (Sorghum)

CHEMICAL & FORMULATION 2-methyl-2-(methythio) propionaldehyde-o-(methyl carbamyl) oxime

100.0 Pesticidal Use

For control of nematodes on sorghum.

100.1 Application Method/Directions/Rates

100.2 Temik 10%

Crop & Time of Application	Pests Controlled	Pounds/Acre	Ounces/1000 feet of row 36-inch row spacing	Recommended Application
SORGHUM				
At planting	Nematodes	5 to 10	5.5 to 11	Apply granules in seed furrow and cover with soil

Temik 15%

Crop & Time of Application	Pests Controlled	Pounds/Acre	Ounces/1000 feet of row 36-inch row spacing	Recommended Application
SORGHUM				
At planting	Nematodes	3.5 to 7.0	4.0 to 7.5	Apply granules in seed furrow and cover with soil

Pre-harvest and grazing use information and limitations

Sorghum

- Do not make more than one application per crop
- Do not harvest within 90 days of application
- Do not feed green forage or hay to livestock

100.3 Environmental hazards statement

Proposed label will read:

TOXIC TO FISH, BIRDS, AND WILDLIFE

Birds feeding on treated areas may be killed. Keep out of any body of water. Do not contaminate water when cleaning equipment or disposing of wastes. Apply this product only as specified on this label.

101.0 Chemical and physical properties

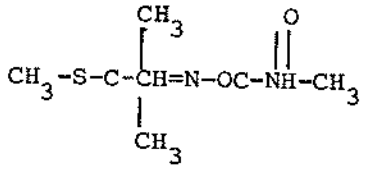
101.1 Chemical name

2-methyl-2-(methylthio)propionaldehyde-o-(methylcarbamoyl)oxime

101.2 Common name

Aldicarb, TEMIK

101.3 Structural formula



101.4 Molecule weight

190.3

101.5 Physical state

White cyrstalline solid with slightly sulfurous odor.

102.0 Behavior in the environment

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

Also see substitute chemicals for aldicarb in EE Br. files

103.0 Toxicological properties

103.1 Acute toxicity

103.1.1 Mammal

See review by J. Edmondson - 8/7/74. - not in File

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 L. Turner - 5/18/78.

103.1.5 Phytotoxicity

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

103.1.6 Beneficial insects

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

103.2.0 Subacute toxicity

103.2.1 Mammal

For subacute inhalation toxicity, see review by R. Felthousen - 4/9/77.

103.2.2 Bird

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

103.4 Field Studies

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

104.0 Hazard Assessment

104.1 Discussion

This review is being made as for an incremental risk assessment for conditional registration. Currently Temik is registered to control certain insects, mites and/or nematodes on cotton, peanuts, potatoes, sugar beets, oranges, dried beans, pecans, soybeans at planting, ornamentals and, in Louisiana only, sugar cane and sweet potatoes. It has also been proposed for use on tomatoes.

Expanding the use of Temik on sorghum will result in adding up to 17 million acres in roughly 23 states (USDA Agricultural Statistics, 1978). This new proposed use is to control nematodes in sorghum with a single application of Temik 10G or 15G at the time of seed planting usually in February or March in Southern states and up to May in northern states. Planting is normally made at a 2" depth. The toxicant is released from the granule carrier when moisture is added to the soil.

For additional discussion see previous reviews by R. Felthousen (4/9/77, 7/6/77, 1/19/79) and L. Turner (5/18/78)

104.1.1 Likelihood of Exposure to Non-target Organisms

Aldicarb (Temik) is toxic to non-target organisms as indicated in toxicity data cited in previous reviews.

Numerous avian and mammalian wildlife species utilize sorghum fields for feeding, nesting, cover, brood rearing, and/or loafing (according to W. Gusey and Z. Maturgo, "Wildlife Utilization of Croplands"). Some species within several states will frequent sorghum fields the year around (Texas, Oklahoma, Nebraska, Missouri, Kansas). Because of this, the likelihood of exposure to Temik is increased, both to "new" and "old" populations.

Under the proposed use pattern, this product can be expected to significantly increase the risk of adverse effects on the environment by posing a hazard to nontarget species (i.e. pheasants, bobwhite quail, rabbits) and an endangered species (i.e., Attwater's, prairie chicken). Fish could also be adversely affected from runoff.

Within sorghum fields, the application of Temik 10G @ 11 oz/1000 ft^2 of row can be expected to result in residues of 0.88 mg a.i./ ft of surface area and 0.9 mg a.i./ft^2 with applications of Temik 15G. (See attached for calculations.)

As previously discussed by L. Turner (5/18/78), the bobwhite quail LD50 is 3.4 mg/kg for Temik 15%. Assuming that a bobwhite quail weighs 190 grams, the lethal dose of Temik would be 0.646 mg/quail. One Temik 10G granule contains 0.2 mg. a.i. and one Temik 15G granule contains 0.3 mg. a.i. If four 10G or three 15G granules are ingested they would possibly constitute a lethal dose to a bobwhite quail or other avian species of similar weight.

104.1.2 Endangered Species Considerations

(See R. Felthousens' 1/19/79 review for comments regarding the paucity of environmental and chemistry data to facilitate a thorough hazard assessment of this product.)

See attached telephone record sheets of contacts made with individuals regarding endangered species concerns.

While there is a number of threatened/endangered species in the numerous states (see Appendix I) where sorghum is grown, the species most likely to exposed to Temik is the Attwaters' prairie chicken in Texas. It is found to be most numerous in gulf coastal prairies bordering the Gulf of Mexico. These birds utilize sorghum fields for courting, loafing and eating purposes. Sorghum is planted in late February/March and harvested in June/July. According to Bill Brownley of the Texas Parks and Wildlife Department, a greater number of Attwaters' prairie chickens are found in Arkansas and Refugio counties. He suggests that the greatest danger to the birds would be at turning points where spillage of the granular pesticide may occur.

Attwater's Prairie Chicken (Tympanuchus cupido attwateri)

Range:	(Texas)	Harris, Galveston, Brazoria, Fort Bend, Waller, Austin, Colorado, Wharton, Aransas, Refugio, Victoria, Dewitt, and Goliad counties.
Habitat:		Restricted to gulf coastal prairies grasslands.
Food Habits:		Approximately 88 percent plant meterial, of which more than 50 percent is seed and seed pods, and 12 percent animal matter (insects).

104.1.3 Adequacy of Toxicity Data

The following studies satisfy regulatory requirements for registration:

1. Avian subacute dietary LC_{50} waterfowl
2. Aquatic invertebrate 48-hour LC_{50}
3. Avian acute oral LD_{50} for mallard ducks*
4. Avian subacute dietary LC_{50} for bobwhite quail*

* Validations attached

104.1.4 Additional Data Required

1. Fish acute 96 LC_{50} - warm water species (bluegill sunfish)
2. Fish acute 96-hour LC_{50} - cold water fish species (rainbow trout).

105.0 Classification

(See R. Felthousen's review of 1/19/79)

106.0 RPAR Criteria

(See R. Felthousen's review of 1/19/79)

107.0 Conclusions

The Ecological Effects Branch does not concur with the proposed new use of Temik (10G or 15G) based upon an incremental risk assessment. This new use, involving a single application of the product(s) at sorghum seed planting time, encompassing up to 17 million acres in 23 states, is expected to result in exposure to new wildlife populations not previously exposed or increased exposure to the populations that are at risk from current pesticide usage. Temik applications are expected to present significant increases in risks to birds feeding in treated areas. Sorghum fields are areas of high wildlife utilization and represent very high acreages.

The EE Branch is opposed to the conditional registration of Temik 10G and Temik 15G to control nematodes in sorghum because of the significant incremental increase in risks. EEB recommends that this use pattern not be conditionally registered.

Raymond W. Matheny/Larry Turner
Ecological Effects Branch 8/8/79 Raymond W. Matheny Larry Turner

David Coppage, Section Head
Ecological Effects Branch 10/9/79

Clayton Bushong, Chief
Ecological Effects Branch
Hazard Evaluation Division 10/9/79

Appendix I

Major Sorghum growing states (from USDA Agric. Statistics 1978)

	State	Acres (X1000)
(1)	Texas	8,000
(2)	Kansas	4,100
(3)	Nebraska	2,100
(4)	Oklahoma	760
(5)	Missouri	625
(6)	Colorado	510
(7)	South Dakota	410
(8)	New Mexico	353
(9)	Arkansa	230
(10)	California	230
(11)	Arizona	130
(12)	North Carolina	115
(13)	Georgia	80
(14)	Mississisippi	75
(15)	Alabama	65
(16)	Tennessee	51
(17)	Iowa	40
(18)	Kentucky	36
(19)	South Carolina	30

Appendix II

Species using sorghum fields (compiled by Gusey and Maturgo, 1973*

Species	Use
Bobwhite Quail	F,H,C,B,L
Ring-necked Pheasant	C,F,B,N
Wild Turkey	F,C,N,B,L
Prairie Chicken	F,L,C,B
Mourning Dove	F,I
Water Fowl	F,L,I
Sandhill Crane	F,L,I
Cottontail	C,F,I,L
Jack Rabbit	C,F,L
Deer	F,C,L
Antelope	F
Squirrel	F,L,I

* Species compiled from the major sorghum growing states: Kansas, Nebraska, Oklahoma, Texas, Missouri, Arkansas

** Wildlife Utilization Key

F -- Feeding

N -- Nesting

C -- Cover

B -- Brood Rearing

L Loafing

Appendix III

Calculations for determining 0-hour residues from the use of Temik 10G to wildlife:

(1) Application method to control nematodes

Directions: Temik 10G: At planting Apply

5-10 lbs/acre (5.5 - 11 oz./1000 feet of row)

Apply granules in seed furrow and cover with soil.

(2) Assume a 3 inch furrow:

11 oz (higher rate)/1000 ft. of row =

11 oz./250 ft^2 =

330g/250 ft^2 = (assume 1 oz. = 30g)

1.32 g/ ft^2 =

0.132 gr a.k./ft^2 =

132 mg a.i/ft^2

(3) Soil surface covered 0-1" SDF = 100X

1-3" SDF = 200X

1-2" SDF = 150X

(4) Sorghum furrows covered with 1-2" soil

(5) 132 mg a.i./ft^2 ÷ 150 = 0.88 mg a.i./ft^2 on surface

Appendix IV

Calculations for determining 0-hour residues from the use of Temik 15G to Wildlife:

(1) Application method to control nematodes

Directions: Temik 15G - At planting apply 3.5 to 7.0 lbs/acre (4.0 to 7.5 oz./1000 feet of row

Apply granules in seed furrow and cover with soil.

(2) Assume a 3 inch furrow:

7.5 oz (higher rate)/1000 ft. of row =

7.5 oz./250 ft^2 = (assume 1 oz - 30g)

225 gr/250 ft^2 =

0.9 gr/ft^2 = (0.9 x .15 = .135)

0.135 gr. a.i/ft^2 =

135 mg a.i./ft^2

(3) Soil surface covered 0-1" : SDF = 100X

1-3" SDI = 200X

1-2" SDF = 150X

(4) Sorghum furrows covered with 1-2" soil

(5) 135 mg a.k./ft^2 ÷ 150 = 0.9 mg a.i./ft^2 of surface

RECORD OF TELEPHONE CALL OR VISITOR

INCOMING CALL ☐ OUTGOING CALL ☒ VISITOR ☐

DATE: 6/14/79 TIME: 2:25 pm

NAME OF PERSON: Dave Tiller

NAME & ADDRESS OF COMPANY: Dept. of Agric., Tex.

Wharton County

COMPANY TEL. NO. (Include Area Code): (717) 532-3310

REGISTRATION NO. OR FILE SYMBOL:

DATE OF EARLIEST SUBMISSION:

BRIEF SUMMARY OF CONVERSATION

I ask Mr. Tiller about the sorghum crop in Texas and the presence of the Atwater's Prairie chicken in the fields. To his knowledge this bird is scarce in his county. He's not seen one in the 25 years he's been in the area. He is not aware of their numbers, though has heard of efforts to reestablish them by the government.

ACTION TAKEN

RECORDED BY (Name): RAY MATHENY RWM

REFERRED TO (Name):

PR FORM 3-5 (OCT. 1981)

USDA-A

RECORD OF TELEPHONE CALL OR VISITOR

INCOMING CALL ☐ OUTGOING CALL ☒ VISITOR ☐

DATE: 6/14/79 TIME: 1:40

NAME OF PERSON

Ted Fisher

NAME & ADDRESS OF COMPANY

Tex. Dept. of Wildlife

Austin, TX.

COMPANY TEL. NO. (Include Area Code)

(512) 478-5608

REGISTRATION NO. OR FILE SYMBOL

DATE OF LATEST SUBMISSION

BRIEF SUMMARY OF CONVERSATION

Mr. Fisher deferred answering my questions on the Atwater's prairie chicken. He ask me to talk with Mr. R. J. Hodges @ (713) 845-2801.

Mr. Hodges referred me to Mr. Bill Bromley @ (713) 475-4877.

ACTION TAKEN

RECORDED BY (Name)

RAY MATHENY RWM

REFERRED TO (Name)

FS FORM E-5 (OCT. 1971)

USDA-AI

RECORD OF TELEPHONE CALL OR VISITOR

DATE: 6/14/79 TIME: 3:15 pm

INCOMING CALL ☐ OUTGOING CALL ☒ VISITOR ☐

NAME OF PERSON

Bill Brownley

NAME & ADDRESS OF COMPANY

Texas Parks and Wildlife Dept.

Austin, TX

COMPANY TEL. NO. (Include Area Code)

(8) 713-475-4877

REGISTRATION NO. OR TAIL SYMBOL

DATE OF LATEST SUBMISSION

BRIEF SUMMARY OF CONVERSATION

I ask Mr. Bromley about the habits of the prairie chicken (Atwater's) re: sorghum growing in the Texas coastal growing areas.

ACTION TAKEN

He indicated that: (1) the prairie chickens do utilize sorghum fields for eating, resting and courting. The greater number of birds are found in Aransas and Refugio counties. They will be found in the middle of the fields where "booming grounds" are established in lage April/May. Later they tend to congregate on the edge of fields and will disperse to adjacent grassy areas when disturbed. Mr. Brownley implied that there could be a risk to the birds if granular materials are spilled in turn areas. The birds, however, do not frequent sorghum fields until the sorghum is 5"-12" high. The prairie chickens do best on dry land grassy prairies. Their numbers are greatly reduced when flooding occurs. Increased cultivation of lands also reduces their natural habitat.

RECORDED BY (Name)

RAY MATHENY RWM

REFERRED TO (Name)