100601

(19)

EE BRANCH REVIEW

DATE: IN 8-18-80 OUT 8/25/80

FILE OR REG. NO. Section 18 (3125-283; 80-OR-14)

PETITION OR EXP. PERMIT NO.

DATE DIV. RECEIVED 8-13-80

DATE OF SUBMISSION 7-21-80

DATE SUBMISSION ACCEPTED

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

DATA ACCESSION NO(S).

PRODUCT MGR. NO. P. Critchlow (41)

PRODUCT NAME(S) Nemacur 3EC

COMPANY NAME Mobay Chemical Corp.

SUBMISSION PURPOSE Section 18 request for Nemacur 3EC for use on raspberries in Oregon

CHEMICAL & FORMULATION Fenamiphos

8 pages

Emergency Use Permit

100.0 Pesticide Use

The pesticide intended to be used for control of root lesion nematode is NEMACUR 3 Emulsifiable Systemic Insecticide-Nematicide, active ingreident: Ethyl-3-methyl-4-(methylthio) phenyl (1-methylethyl) phosphoramidate, EPA Reg. No. 3125-283, manufactured by Mobay Chemical Corporation.

100.1 Application Method/Directions

The proposed rate of application of NEMACUR 3 EC is 2 to 4 gallons per treated acre, which is equivalent to 6 to 12 pounds active ingredient per treated acre. The maximum amount needed to treat 25% of the raspberry acreage in Oregon at an average rate of 3 gallons per acre would be 2475 gallons or 7425 pounds of active ingredient.

NEMACUR 3 EC will only be used in the raspberry producing areas in countries west of the Cascade mountains.

Applications will be made by ground equipment at a rate of 2 to 4 gallons of NEMACUR 3 EC (6.0-12.0 lbs. a.i.) per acre using low pressure ground boom sprayers that evenly apply 20 to 80 gallons of water per treated acre. Applications will be as a broadcast spray to fully cover the potential root zone where weeds or sod are chemically or mechanically kept cleared or mowed.

NEMACUR 3 EC will be applied after September 1, 1980, and used when adequate rainfall can be expected to incorporate the nematicide. Applications will be completed by December 31, 1980.

Since NEMACUR 3 EC is a Restricted Use Pesticide, growers who apply it must be certified private applicators or hire licensed pesticide applicators. Raspberry growers use other highly toxic materials during their normal operations, so they are familiar with the procedures necessary for safe use. The Oregon State University Extension Service and Plant Clinic and consulting nematologists can provide expert advice to growers regarding nematode analysis.

101.0 Chemical and Physical Properties

101.1 Chemical Name:
Ethyl-3-methyl-4-(methylthio)phenyl(1-methylethyl)phosphoramidate

101.2 Common Name: Nemacur

101.3 Structural Formula

101.4-
103.0 See the following reviews:

T.F. O'Brien's amended by L. Turner for Nemacur on citrus (November 25, 1977) and nonbearing fruit trees (November 29, 1977).

103.0 Toxicological Properties

Please refer to the report by L. Touart (1/14/80). He has an updated synopsis on the wildlife test and validation. Studies relative to this emergency use permit are listed:

Avian Dietary LC_{50}

	LC_{50} (95% C.I.)	Category
Bobwhite Quail (Tech)	36(31-45) ppm	Core
Mallard Duck (Tech)	316(221-457) ppm	Core
Japanese Quail (Tech)	59(49-71) ppm	Supplemental

Fish Acute LC_{50}

	LC_{50} (95% C.I.)	Category
Rainbow Trout (Tech	72.1 ppb	Core
Bluegill Sunfish (Tech)	17.7 ppb	Core
Bluegill Sunfish (Tech)	9.5(6.8-15) ppb	Core
Bluegill Sunfish Sulfoxide	2653(1000-4600) ppb	Core
Bluegill Sunfish Sulfone	1173(1000-1500) ppb	Core

Aquatic Invertebrate LC_{50}

	LC_{50} (95% C.I.)	Category
Daphnia magna (Tech)	1.6(1.3-1.9) ppb	Supplemental

104. Hazard Assessment

104.1 Discussion

Nemacur is very highly toxic to bobwhite quail, Japanese quail, fish, aquatic invertebrates, and highly toxic to the mallard duck. It is reasonable to assume that the nematicide can be very hazardous to wildlife. In addition, it degrades into sulfoxide and sulfone which are toxic. Both the parent product and its metabolites are systemic in action and transported to other parts of the plant. There is the possibility that sulfone and sulfoxide concentrate at ten times the original parent level.

Nemacur is a slight leacher in some soils, especially lighter soils. In heavier soils some residue absorption takes place, and some runoff can occur. The halflife of the parent product in water at a pH of 7 is approximately seven days but apparently is temperature dependent. The lower temperatures prolong the halflife. Th parent Nemacur

photodegrades rapidly into sulfone and sulfoxide, but no specific information is available for these degradates.

The use pattern for Nemacur on raspberries could cause wildlife mortality. Raspberries are grown on with 9-10 foot row spacing (see attached phone conversation record). Depending on the farming practices, these spacings could provide cover for a variety of wildlife. Some farmers use the herbicide paraquat to control the vegetation, while others lightly disc or rototill. The rows are band herbicided two feet on a side. The threat to terrestrial wildlife is mitigated to some extent by the time of application. Th berries should be harvested by the proposed application date, so the berries attracting large concentrations of wildlife shouldn;t occur. However, these interrow spacings, where vegetation exists, will provide cover, loafing and feeding areas for a variety of wildlife. Animals exposed to direct contact or residues on food supplies from this chemical could be poisoned.

The threat to fish is even greater. For maximum effectiveness, Nemacur 3 EC has to be incorporated into the soil. This liquid concentrate relys on water incorporation. It is sprayed just before an anticipated rain or the land is irrigated shortly afterwards. Apparently, about 65% of the acreage is irrigated. Under the prevailing conditions some runoff or entry into irrigation canals can be anticipated. Also, the lower fall temperatures probably prolong the halflife of Nemacur in water. In the raspberry growing areas, the streams contain Salmonids and trout. These fish are sensitive to pesticide poisoning. Nemacur is very highly toxic to fish and if the parent compound enters the fish bearing waters, a fish kill is quite possible. (See the record of the phone call to Mr. Jim Haas of the Oregon Dept. of Fish and Wildlife.) The Oregon Department of Fish and Wildlife is concerned about the possible detrimental effects of this product and would like to be notified when spraying is done. If possible, they would like a biologist to be present to monitor any wildlife mortality.

104.1.2 Endangered Species

The proposed use pattern should preclude any contact with endangered species.

107.0 Conclusions

Because Nemacur is very highly toxic to wildlife, the Ecological Effects Branch does not encourage its use and will probably unfavorably review repeated applications for its use. Alternative nematicides should be considered . However, due to the small acreage involved and that certified applicators must apply the chemical, the EEB concurs with this emergency use permit provided certain conditions are met. These are:

1. The Oregon Department of Fish and Wildlife is provided opportunity to observe the application of Nemacur and monitor its effect on wildlife populations. The person to contact is:

Mr. Jim Haas
Chief Environmental Section
Oregon Department of Fish and Wildlife
P.O. Box 3503
Portland, Oregon 97205
Phone: 229-5433

2. If any wildlife mortality occurs, its occurrence is to be reported to the Oregon Department of Fish and Wildlife

Wayne C. Faatz, Ph.D.
Wildlife Biologist
Ecological Effects Branch

Wayne C Faatz 8/25/80

Dave Coppage
Section Head #3
Ecological Effects Branch

Dave Coppage 8/25/80

Clayton Bushong
Chief
Ecological Effects Branch

8/25/80

NEMACUR RESIDUE ANALYSIS OF RASPBERRY FRUIT

Treatment	Rate Lbs. Active	Ac	Location and ppb of Nemacur sulfone Bor.	Plag.	May.	Box	Ehl.
Control	-0	77-78	0	0			
	12	77-78	57	18			
	24	77-78	69	39			
Control	0	77	0	0			
	12		18	36			
	24		16.5	12.3			
Control	0	78			10.9	0	2.1
	12				23.7	6.3	28.2
	24				60	17.1	33.9

Resldue analysis of raspberry fruit for Nemacur and it's metabolites:
Analysis by the method of J. S. Thornton: Agricultural Food and Chemistry, Vol. 19, No. 5, Page 890, Sept/Oct., 1971

Analysis by: IR-4 Lab., Department of Animal, Oairy and Veterinary Science, Utah State University, Logan, Utah 84322 - Or. Joseph Street (Detection limit 5 ppb)

The analytical method involved extraction and the extract was oxidized to convert the Nemacur and it's sulfoxide form to the sulfone.

The above residue levels are well within the tolerance levels set for other food products with registrations for Nemacur.

77-78 indicates that Nemacur was applied in December of 1977 and 1978.
77 indicates that Nemacur was applied in December of 1977 only.
78 indicates that Nemacur was applied in December of 1978 only.

All of the applications were applied as a dilute spray to the surface of the soil and the total area was treated.

Rates indicate rates per treated acre.

Location indicates farm location of the experimental plots.

Telephone Record

TO: Mr. Jim Haas
Chief Environment Sections
Oregon Department of Fish and Wildlife
P.O. Box 3503
Portland, Oregon 97205
Phone: 503/229/5433

19 August 1980

FROM: Wayne C. Faatz

SUMMARY:

Mr. Haas was concerned about the use of Nemacur because of its toxicity, especially to fish. The streams in the raspberry growing area do contain Salmonids and trout. He would appreciate the opportunity to observe and monitor the use of Nemacur. He feels there is a reasonable concern about wildlife mortality.

Telephone Record

TO: Mr. W. Arden Sheets
Oregon State University
Extension Service
Washington County Office
Court House
Hillsboro, Oregon 97123
Phone: 503/648/8771

19 August 1980

FROM: Wayne C. Faatz

SUMMARY:

Mr. Sheets provided information on agricultural practices for raspberries.

Raspberries are usually grown on wire lattices with 9-10 foot row spacing. The bushes are band herbicided two feet on a side. The remaining 6 foot interspace is either treated with herbicides or mechanically shallow tilled, approximately 6", to discourage weeds. In hilly country, these interspaces are used for erosion control. Approximately, 50% of the raspberry acreage is farmed by no till methods and about 65-75% of the total acreage is irrigated.

For maximum effectiveness, liquid Nemacur should be irrigated immediately after application or just before a rainfall so it can be water incorporated into the soil. Nemacur is used on established plants.