101201
SHAUGHNESSEY NO.

15
REVIEW NO.

EEB BRANCH REVIEW

DATE: IN 18 MAR 1981 OUT 3 APR 1981

FILE OR REG. NO.

PETITION OR EXP. PERMIT NO.

DATE OF SUBMISSION 1/30/81

DATE RECEIVED BY HED 2/13/81

RD REQUESTED COMPLETION DATE 5/13/81

EEB ESTIMATED COMPLETION DATE

RD ACTION CODE/TYPE OF REVIEW 725/ Food Use EUP

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

DATA ACCESSION NO(S).

PRODUCT MANAGER NO. N. Miller (16)

PRODUCT NAME(S) Monitor 4 Spray

COMPANY NAME Chevron Chemical Company

SUBMISSION PURPOSE Proposed EUP for use on safflowers in California and Arizona

SHAUGNESSEY NO.	CHEMICAL, & FORMULATION	% A.I.
101201		75%

100.0 Section 5 Application

Monitor 4 Spray is an insecticide that is intended for use on safflower for the control of Aphids, Armyworms, Loopers, and Lygus.

100.1 Application Rates/Methods/Directions

Apply 1 to 2 pts. (0.5 to 1.0 lb active ingredient) per acre. Apply as needed prior to bloom and up to 30 days before harvest. Do not apply during bloom period.

This program will consist of spraying safflower for control of insects listed on the proposed label. Applications will begin in late May or early June and will end by late August. The major geographical area involved will be the Central Valley of California with a limited program in Arizona. Shipment of material should begin by May 10, 1981.

100.2 Objectives

MONITOR 4 Spray is EPA labeled on other crops for control of the insects listed on the proposed label. Limited efficacy data on safflower indicates MONITOR is effective against these insects in safflower. The purpose of the proposed program will be to accumulate additional safflower efficacy and residue data from large safflower plots treated under commercial conditions. Observation of effect on non-target organisms will be included in the program.

100.3 Justification for Quantities to be Used:

Safflower is normally planted in late January or early February and requires treatment for lygus or aphid control approximately June 1st when these insects migrate from surrounding areas. Treatment rate would depend upon insect pressure. A large percentage of California acreage is located in an area which is subject to occasional flooding and, in this event, may be replanted in early May. These later plantings usually receive one insecticide application in early July for armyworm and looper control and a second application approximately one month later.

The quantities of MONITOR 4 Spray will allow comparison of high and low label rates under commercial conditions. These data will be used for product registration and establishment of a permanent residue tolerance.

The proposed experimental program will result in spraying a maximum of 1200 acres, or .007% of a total of 170,000 acres in California, and a maximum of 300 acres, or .03% of a total of 11,200 acres in Arizona.

100.4 Duration/Date/Amount Shipped

1. Proposed period of shipment:
   May 10, 1981 to September 10, 1982

2. Permission is requested for 4694 lbs. of product or 2250 lbs of active ingredient

100.5 Geographical Distribution

States	Approx. No. of Trials	Total Acreage to be Treated	Total Gals. of MONITOR 4 Spray*
California	2-4	1200	450 (1800 lbs ai)
Arizona	1-2	300	112.5 (450 lbs ai)
	3-6	1500	562.5 (2250 lbs ai)

*Figures for total gallons of MONITOR 4 Spray based on treating 1500 acres twice with one half of the acreage treated with low and one half with the higher label rate. All of this material will be given free of charge to the cooperators.

101.0 Chemical and Physical Properties

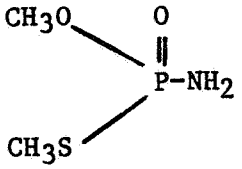
101.1 Chemical Name

O,S-Dimethyl phosphoramidothioate

101.2 Common Name

METHAMIDOPHOS

101.3 Structural Formula:



$C_2H_8NO_2PS$

101.4 Molecular Weight: 141.13

101.5 Physical State: Pungent odor.

101.6 Solubility:

Infinitely miscible with water and alcohol; less than 1% in kerosene; less than 10% in benzene or xylene.

101.7 Volatility: Low

101.8 Vapor Pressure: Approx. 10^{-4} mm Hg at 20° C.

101.9 Density: 1.31 (melt)

101.10 Melting Point: 39-41° C.

102.0 Behavior in the Environment

102.1 Soil

102.1.1 Persistence:

SOIL TYPE	1/2-LIFE (DAYS)
Silt	1.9
Loam	4.8
Sandy	6.1

102.1.2 Degradation:

Major route of degradation in soil appears to be biological. MONOTOR IS NOT Retained by soil particles.

102.2 Water

102.2.1 Hydrolysis:

pH	1/2-LIFE (25° C)	1/2-Life (37° C)
1.5	--	16 hours
2	--	5.6 days
3-8	--	Stable for 2 weeks
7	--	Stable for 1 month
9	2-6 days	1.5 days

102.2.2 Leaching

MONITOR does leach but degrades rapidly while leaching.

102.3 Plant

102.3.1 Metabolism/Uptake:

Metabolic pathway is strictly hydrolytic. When applied to soil MONITOR readily moves throughout the whole plant via root system. When applied to leaves, it translocates only with the transpiration stream towards the margins of treated leaves (apoplastic translocation). No translocation occurs out of the treated leaves via the phloem into the stem or other leaves.

102.4 Animal

102.4.1 Bass were exposed to 0.01 ppm for 8 days. Residues in fish were less than 0.02 ppm.

102.4.2 Bass were exposed to 1 ppm for 28 days and were put into a newly fortified tank every 7 days. Results:

Days in H_2O	Net Residues in fish ppm	ppm in H_2O
Control	.014	0 days 0,75 - 1.63
7	.049	1.0 - 1.07
14	.050	1.5 - 1.07
21	.048	1.38 - 1.03
28	.072	0.92 - 1.06
1 day withdrawal	.014	
14	.014	
21	.014	

The above two studies indicate no accumulation of MONITOR accured.

103.0 Toxicological Properties

103.1.0 Fish LC_{50}

Bluegill sunfish 96-hr. LC_{50} = 34 ppm
Rainbow trout 96-hr. LC_{50} = 25 ppm

103.1.1 Aquatic invertebrates Acute LC_{50}

Daphnia magna 48-hr LC_{50} = 26 ppb

103.1.2 Avian Dietary LC_{50}

Mallard Duck 8-day dietary LC_{50} = 1302 ppm

103.1.3 Avian Acute LD_{50}

Bobwhite quail Acute Oral LD_{50} = 11.0 mg/kg

103.2.0 Avian Reproductive Studies

Bobwhite Quail Reproductive impairment occurs at 5 ppm and higher. No effect level is between 3 and 5 ppm.

Mallard Duck No reproductive impairment up to and including 15 ppm

103.3 Mammalian

Rat LD_{50}=13 mg/kg

104.0 Hazard Assessment

Discussion

Monitor 4 spray will be applied at the rate of 0.5 to 1.0 lb active ingredient per acre. Application frequency will occur, as needed prior to bloom and up to 30 days before harvest.

Available toxicity data suggest that Monitor is slightly toxic to fish (trout LC_{50} = 25 ppm) but highly toxic to aquatic invertebrates (Daphnia LC_5 = 26 ppb). A direct application of Monitor to water will, theoretically, result in concentration levels of about .734 ppm for the top 6 inches.

Monitor appears to be very highly toxic to avian species. Reproductive studies on bobwhtie quail indicated that impairment occured at 5 ppm and higher. Acute toxicity studies on bobwhite quail and the Dark-eyed junce (Junce hyemalis) reported LC_{50} values of 11 mg/kg and 8 mg/kg, respectively. Calculated LC_{50} values for the same species are in the 36 ppm range.[1] A potential for acute hazard to avian species is possible, since, the expected residue levels on food items, such as insects and seeds, are in the 12 to 58 ppm range.

Small mammals such as rodents and insectivores may be adversely affected when repeated applications are made. A simulated field study using rabbits indicated that after two applications of 1.0 lb/a.i./acre Monitor, 6% mortality occured (refer to McLane's review 2/9/79).

104.1 Endangered Species Consideration

Monitor 4 Spray is to be applied primarily in the California central valley. This area is also the habitat range of certain federally designated endangered species. The following species occur in or around the counties where safflower crops occur:

1) California condor (Gymnogyps californianus)

2) American peregrne falcon (Falco peregrinus anatum)

3) Aleutian Canada goose (Branta canadensis leucopareia)

4) San Joaquin kit fox (Vulpes macrotis mutica)

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1) extrapolated from LD_{50} data

The above species feed directly upon small and medium size mammals and birds. Secondary contamination from feeding should not occur since Monitor hydrolyzes rapidly and does not bio-accumulate. Therefore, the danger to endangered species appears minimal.

105.0 Data Adequacy

The five basic studies submitted with the December 10, 1980 submission were all acceptable to support registration action.

105.1 Data request

Refer to previous reviews,

107.0 Conclusions:

The Ecological Effects Branch recommends concurrence with the proposed experimental use permit of Monitor 4 spray on safflower. However, consideration should be given to the acute hazard to avians and small mammals (Section 104.0)

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