108801
+
080808

(12)

EEE BRANCH REVIEW

DATE: IN 12/15/78 OUT 1/11/79 IN _____ OUT _____ IN _____ OUT _____

FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. _____

PETITION OR EXP. PERMIT NO. 100-EUP-AE

DATE DIV. RECEIVED 11/24/78

DATE OF SUBMISSION _____

DATE SUBMISSION ACCEPTED _____

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

DATA ACCESSION NO(S). _____

PRODUCT MGR. NO. 23

PRODUCT NAME(S) Milocep™ Herbicide

COMPANY NAME CIBA-GEIGY

SUBMISSION PURPOSE Experimental Use Permit - Grain Sorghum

CHEMICAL & FORMULATION 108801 (1). metolachlor: 2-chloro-N-(2 ethyl-6-methyl-phenyl) N-(2-methoxy-1-methylethyl) acetamide 36.3%

080808 — (2). propazine: 2-chloro-4,6-bis (isopropylamino)-s-triazine 18.7%

100.0 Pesticidal use

Milocep 5L is a herbicide combination of metolachlor and propazine that is proposed for preplant incorporated or preemergence control of most annual grasses and broadleaf weeds in sorghum grown for grain.

100.1 Application methods/directions/rates

Application: Apply Milocep either preplant incorporated or preemergence at the appropriate rate from the following rate table. Preplant Incorporated: Apply to the soil within 14 days before planting and incorporate into the top 2 inches, using a disk, harrow, rolling cultivator, or similar implement. Use a preplant incorporated application if furrow irrigation is used or when a period of dry weather after application is expected. If sorghum is to be planted on beds, apply and incorporate after bed formation. Preemergence: Apply to the soil surface at planting, or after planting but before weeds or sorghum emerge.

Soil texture	Broadcast rate per acre
COARSE Sand, loamy sand	DO NOT USE
sandy loam	3-3.5 pts.
MEDIUM Loam, silt, silt loam	3.5-4.5 pts.
FINE Silty clay loam, sandy clay loam, clay loam, sandy clay, silty clay, clay	4.5-5 pts.

For band applications use proportionately less Milocep so that no areas will be treated at more than 5 pints per treated acre.

Dilute Milocep so that a minimum of 15 gallons per acre of finished spray is applied by ground equipment or a minimum of 2 gallons per acre of finished spray is applied by aerial equipment.

100.3 Precautionary labeling

Environmental Hazards

Keep out of any body of water. Do not apply where runoff is likely to occur. Do not contaminate water by cleaning of equipment or disposal of wates. Do not apply when weather conditions favor drift from areas treated.

100.4 Proposed EUP program

100.4.1 Objectives

To gather larger plot data and yield checks to support the full registration of Milocep 5L on sorghum.

100.4.2 Duration/date/amount shipped

The EUP is requested for a period of one year beginning March 1, 1979.

A total of 34 gallons of Milocep 5L (113 pounds a.i. of Metolachlor and 56.4 pounds a.i. of propazine) is requested for shipment. It is proposed that 31.23 gallons will be used to treat a total of 50 acres distributed among the following states:

State	acres	gallons to be used
Arkansas	2	1.25
Colorado	2	1.25
Kansas	8	5.00
Missouri	3	1.87
Nebraska	8	5.00
New Mexico	3	1.87
North Carolina	1	.62
Oklahoma	3	1.87
Texas	20	12.5
Total	50	31.23

100.4.3 Application procedures

See section 100.1

100.4.4 Target pests

For evaluation of control of these weeds:

barnyardgrass (watergrass)
crabgrass
cupgrass
fall panicum
giant foxtail
goosegrass
green foxtail
johnsongrass (seedling)
signalgrass (Brachiaria)
witchgrass
yellow foxtail
yellow nutsedge
carpetweed
cocklebur
coffeeweed
Florida beggarweed
jimsonweed
knotweed
lambsquarters
morningglory
mustards
pigweed
purslane
prickly sida
ragweed
sunflower
velvetleaf

For evaluation of partial control of these weeds:

sandbur	Texas panicum
shattercane	volunteer sorghum

100.4.5 Geographical site features

Tests will be conducted in all major sorghum producing states as listed in section 100.4.2. The actual sites of application will not be known with certainty until just before application.

100.4.6 Test program description/features

The following treatments will be evaluated in the program.

1. Milocep 5L with water carrier preplant incorporated.
2. Milocep 5L with fluid fertilizer carrier preplant incorporated.
3. Milocep 5L with water carrier preemergence.
4. Milocep 5L with fluid fertilizer carrier preemergence.

101.0 Chemical and Physical Properties

101.1 Chemical name

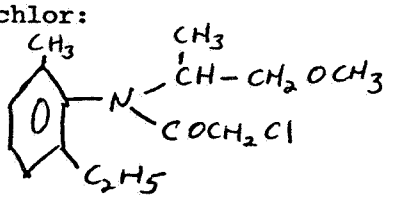
(1) 2-chloro-N-(2-ethyl-6-methylphenyl)N-(2-methoxy-1-methylethyl)acetamide
(2) 2-chloro-4,6-bis(isopropylamino)-s-triazine

101.2 Common name

(1) Metolachlor, Dual®
(2) Propazine, Milogard®

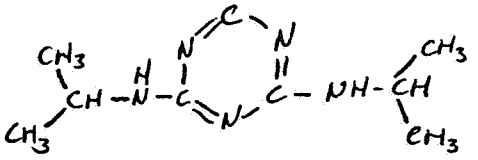
101.3 Structural formula

(1) Metolachlor:



$C_{15}H_{22}O_2NCl$

(2) Propazine:



$C_9H_{16}N_5$

101.4 Molecular weight

(1) Metolachlor: 283.5
(2) Propazine: 194

101.5 Physical state

(1) Metolachlor: Odorless, white to tan liquid
(2) Propazine: Colorless, crystalline solid

101.6 Solubility

(1) Metolachlor: Soluble in water to 530 ppm at 20°C; miscible with most organic solvents, but insoluble in ethylene glycol.
(2) Propazine: Soluble in water to 8.6 ppm at 20°C; "difficult to dissolve in most organic solvents."

102.0 Behavior in the Environment

Because of the small acreage involved and the current registration of tank mixtures of metolachlor and propazine, the Environmental Fate data were not examined. Some fate data for metolachlor is available in previous EEB reviews for metolachlor or Bicep (metolachlor plus atrazine).

103.0 Toxicological Properties

103.1 Acute toxicity

103.1 Mammal

1. Metolachlor

(a) Reference: Toxicology report by C. Frick, 1/4/77.
Rat acute oral LD_{50} (technical) = 2780 mg/kg.
(b) Reference: Toxicology memo by N. Levy, 4/11/77.
Rat acute oral LD_{50} (Dual 6E) = 2828 mg/kg.
(c) Reference: Toxicology memo by S. L. Chan, 1/31/78.
Rat acute oral LD_{50} (Dual 8E) = 2533 mg/kg.

2. Propazine

Reference: Toxicology report by R. Coberly, 8/7/68.
Mouse acute oral LD_{50} (tech?) > 5 grams/kg.
Rat acute oral LD_{50} (tech?) > 5 grams/kg.

103.1.2 Bird

1. Metolachlor

Reference: EEB review by J. Tice/S. Labuda, 3/14/78
Mallard acute oral LD_{50} (tech) = 4640 mg/kg core

2. Propazine - no data available

103.1.3 Fish

1. Metolachlor

Reference: EEB review by J. Tice/S. Labuda, 3/14/78
Rainbow trout 96-hr LC_{50} (tech) ≈ 2 ppm invalid
C. carassins 96-hr LC_{50} (tech) = 4.9 ppm supplemental
C. auratus 96-hr LC_{50} (tech) = 60 ppm supplemental
Ictalurus punctatus 96-hr LC_{50} (tech) = 1.9 ppm core
Bluegill sunfish 96-hr LC_{50} (tech) ≈ 15.0 ppm invalid
Guppy 96-hr LC_{50} (tech) = 8.6 ppm supplemental

2. Propazine

Reference: EEB review by H. T. Craven, 11/8/76.
Carassius auratus 96-hr LC_{50} (98.7%) > 32 ppm not validated
Bluegill sunfish 96-hr LC_{50} (98.7%) > 100 ppm not validated
Rainbow trout 96-hr LC_{50} (98.7%) = 17.5 ppm not validated

103.1.4 Aquatic invertebrates

1. Metolachlor

Reference: EEB review by J. Tice/S. Labuda, 3/14/78
Daphnia magna 48-hr LC_{50} (tech) = 25.1 ppm core.

2. Propazine - no data available.

103.2 Subacute toxicity

1. Metolachlor

Reference: EEB review by J. Tice/S. Labunda, 3/14/78.
Bobwhite 8-day dietary LC_{50} (tech) > 10,000 ppm core
Mallard 8-day dietary LC_{50} (tech) > 10,000 ppm core

2. Propazine

Reference: EEB review by H. T. Craven, 11/8/76.
Bobwhite 10-day dietary LC_{50} (80W) = 7850 ppm not validated
Mallard 8-day dietary LC_{50} (80W) = 32,000 ppm not validated

104.0 Hazard assessment

104.1 Discussion

Milocep 5L contains 1.66 pounds a.i./gallon of propazine and 3.33 pounds a.i./gallon of metolachlor. At the maximum rate of 5 pints/acre, this would result in soil surface residues of 10.8 mg/ft^2 propazine and 21.7 mg/ft^2 metolachlor or 22.8 ppm propazine and 45.8 ppm metolachlor in top 0.1 inch of soil. If this is applied as a preplant incorporated into the top 2 inches of soil, the residues in the top 2 inches of soil would be 1.14 ppm propazine and 2.3 ppm metolachlor.

It should be noted that tank mixtures of propazine and metolachor have already been registered.

104.1.1 Likelihood of exposure to non-target organisms

Gusey and Maturgo (Wildlife Utilization of Croplands, Shell Oil Co., 1973) list a number of non-target organisms as potentially ocurring in sorghum. These include upland game birds such as pheasant, quail, and prairie chickens (including Attwater's Prairie chicken),

ducks, geese, sandhill cranes, and various songbirds. Mammals associated with sorghum include deer, rabbit, squirrels, raccoon, antelope, and javelina. The available data, both validated and unvalidated, indicate low toxicity to terrestrial vertebrates. Acute toxicity LD_{50} values for birds and mammals are consistently greater than 2 grams/kg; dietary avian LC^{50} values all exceed 7500 ppm. With maximum expected residues of less than 50 ppm, no hazard is expected to terrestrial vertebrates.

Data on fish indicate low to moderate toxicity, ranging from 1.9 to > 100 ppm. As a soil surface application without aerial application being specified on the label, it is unlikely that this product will reach the aquatic environment in any significant amounts. Negligible hazard is expected to fish and aquatic invertebrates, especially since only 50 acres is to be treated.

104.1.2 Endangered species considerations

The endangered Attwater's prairie chicken and Mississippi Sandhill Crane occur in areas where sorghum is grown, although the EUP program does not include the Mississippi sandhill crane area. The Leopard darter occurs in Oklahoma, and five endangered fish occur in Texas. Because of the low toxicity and very limited acreage, no hazard is expected for endangered species.

Adequacy of toxicity data

No data were reviewed with this submission. In previous reviews, data on metolachlor were validated. All of the minimum required studies for metolachlor have been reviewed as core, except that the coldwater fish studies were invalid or core. No data on propazine have been validated at this time.

104.1.4 Data requests

For metolachlor, a coldwater fish 96-hour LC_{50} is required to complete the minimum requirements for registration. For propazine, data requests cannot be determined until currently available studies are validated. However, there appear to be no propazine data on avian acute LD_{50} and aquatic invertebrates. Also the avian dietary studies would most likely be needed for technical propazine rather than the 80W formulation.

Studies in addition to the minimum requirements may be required for metolachlor and/or propazine.

107.0 Conclusion

107.1 Environmental Fate and Toxicology

Toxicology data for propazine was obtained from Toxicology Branch reports by C. Frick (1/4/77), N. Levy (4/11/77), and S. L. Chan (1/31/78). Metolachlor data was obtained from Toxicology Branch report by R. D. Coberly (8/7/68). Environmental Fate files were not examined.

107.3 Labeling

The proposed precautionary labeling is adequate for the EUP program.

107.4/5 Data adequacy/requests

See sections 104.1.3 and 104.1.4.

107.7 Recommendations

The Ecological Effects Branch has completed a hazard assessment with respect to the proposed EUP program for Milocep and expects no adverse effects to non-target organisms.

Larry W. Turner
Ecological Effects Branch, Section 1
January 11, 1979

James W. Akerman, Section Head
Ecological Effects Branch, Section 1

2/9/79

Clayton Bushong, Acting Branch Chief
Ecological Effects Branch