108801

(10)

EEE BRANCH REVIEW

DATE: IN 3/17/78 OUT 4/8/78 IN _____ OUT _____ IN _____ OUT _____

FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. 100-LOT

PETITION OR EXP. PERMIT NO. _____

DATE DIV. RECEIVED _____

DATE OF SUBMISSION _____

DATE SUBMISSION ACCEPTED _____

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

PRODUCT MGR. NO. Jacoby (24)

PRODUCT NAME(S) Dual 8E Herbicide

COMPANY NAME Ciba-Geigy

SUBMISSION PURPOSE Registration for corn

CHEMICAL & FORMULATION Active Ingredient:

Metolachlor: 2-chloro-N-(2-ethyl-6-methylphenyl)-N-(2-methoxy-1-methylenthyl)	86.4%
Inert Ingredients	13.6%
TOTAL	100.0%

Dual 8E : New Registration

100.0 Pesticidal Use

For weed control in corn grown for grain excluding popcorn.

100.1 Application Directions/Methods/Rates

General Directions

Dual 8E is a selective herbicide recommended as a preplant incorporated or preemergence surface-applied treatment for control of most annual grasses and certain broadleaf weeds. Dual 8E may be tank mixed with AAtrex^{R} 80W, AAtrex 4L, or AAtrex 4LC and applied preplant incorporated or preemergence for broad spectrum weed control in corn. Dual 8E alone or the tank mixtures with AAtrex may be applied in water or liquid fertilizer with conventional ground sprayers.

Within a rate range for a specific soil category in the rate tables, use the lower rate on soil relatively coarse-textured or low in organic matter; use the higher rate on soil relatively fine-textured or high in organic matter.

Table 1: Dual 8 E Alone

Soil Texture	Broadcast rate per acre [1,2] Less than 3% organic matter	3% organic matter or greater
COARSE: Sand, loamy sand, sandy loam	1 1/2 - 2 pts.*	2 pts.
MEDIUM: Loam, silt loam silt	2 - 2 1/2 pts.	2 - 2 1/2 pts.
FINE: Silty clay loam, sandy clay loam silty clay, sandy clay, clay loam, clay	2 - 2 1/2 pts.	2 1/3 - 3 pts.
Muck or peat soils	DO NOT USE	

*Dual 8E contains 1 lb. a.i. per pint, i.e. pints = pounds a.i.

Rotational Crops: 1) If treated corn is lost due to poor germination, hail, flood, insects, etc., corn may be replanted immediately. Do not make a second broadcast application of Dual 8E. If the original application was banded and the second crop is planted in the untreated row middles, a second banded treatment may be applied. 2) Corn may be planted the year following treatment. Other crops may be planted 18 months after application.

[1]Apply Dual 8E alone or in the tank mixtures in a minimum of 15 gals. of spray mixture per acre.

[2]Calculate the amount of herbicide needed for band treatment by the formula:

$$\frac{\text{band width in inches}}{\text{row width in inches}} \times \text{broadcast rate per acre} = \text{amount needed per acre}$$

Table 2: Dual 8 E + AAtrex

	Broadcast Rate Per Acre			
	Less than 3% Organic Matter		3% Organic Matter or Greater	
Soil Texture	Dual 8E	AAtrex 80W, AAtrex 4L, or AAtrex 4LC	Dual 8E	AAtrex 80W, AAtrex 4L, or AAtrex 4LC
COARSE: Sand, loamy sand, sandy loam	1-1/4 pts.	1.25 lbs. or 2 pts.	1-1/2 pts.	1.5 lbs. or 2.4 pts.
MEDIUM: Loam, silt loam, silt	1-1/2 pts.	1.5 lbs. or 2.4 pts.	2 pts.	2 lbs. or 3.2 pts.
FINE: Silty clay loam, sandy clay loam, silty clay, sandy clay, clay loam, clay	2 pts.	2 lbs. or 3.2 pts.	2 - 2-1/2 pts.	2 - 2.5 lbs.* or 3.2 - 2 pts.*
Muck or peat soils	DO NOT USE			

* For cocklebur, yellow nutsedge, and velvetleaf control on fine-textured soils above 3% organic matter: Apply 2.5 lbs. of AAtrex 80W or 4 pts. of AAtrex 4L with 2 - 2-1/2 pts. of Dual 8E per acre.

100.3 Precautionary Labelling

Storage and Disposal:

Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited. Do not reuse empty container. Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies. Triple rinse (or equivalent) and dispose of in incinerator or landfill approved for pesticide containers, or bury in a safe place. Consult federal, state, or local disposal authorities for approved alternative procedures such as limited open burning.

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 wastes. Do not apply when weather conditions favor drift from areas treated.

Observe all cautions and limitations on labeling of all products used in tank mixtures.

101.0 Chemical and Physical Properties

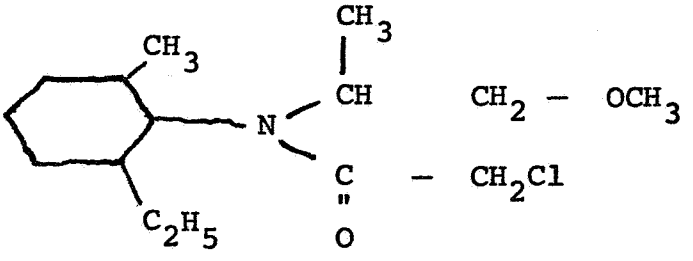
101.1 Chemical Name

2-chloro-N-(2-ethyl-6-methyl phenyl)-N-(2-methyl-1-methylethyl) acetamide.

101.2 Common Name

Metolachlor

101.3 Structural Formula



101.4 Molecular Weight

283.80

101.5 Physical State

Liquid/white to tan/odorless

101.6 Solubility

Metolachlor is soluble in water at the rate of 530 ppm at 20°C. It is mixcible with xylene, tolvene, dimethyl formamide, methyl cellusolve, butyl cellusolve, ethylene dichloride cyclo-hexanone. It is insoluble in ethylene glycol and propylene glycol.

102.0 Behavior in the Environment

Metolachlor has been shown to be persistent in soil (half-life 4-14 weeks depending on soil type) and in water (half-life over 200 days under normal environmental conditions). This chemical is mobile by leaching in soils with the exception of silt loam and muck.

For a detailed review see N. Cook, 100-EUP-38 (1/24/76).

102.4 Special Note: Fish Accumulation

The behavior of Metolachlor in Bluegill sunfish, as reported by one study, is summarized in the following table.

	Mean Measured Concentration of ^{14}C - residues in water	
	0.00931 mg/l	1.1317 mg/l
Maximum mean measured concentration of ^{14}C - residue in fish		
(a) edible portion	0.184 mg/kg	21.23 mg/kg
(b) viscera	4.74 mg/kg	585.05 mg/kg
Biological magnification (relative to ^{14}C - residues in water)		
(a) edible portion	20 X	19 X
(b) viscera	509 X	517 X
Residue elimination after 28 days depuration		
(a) edible portion	56%	46%
(b) viscera	97%	98%

103.0 Toxicology Properties

103.1 Acute Toxicity

103.1.1 Mammal

Albino rats Oral LD_{50} = 2780 mg/kg

103.1.2 Bird

Mallard acute LD_{50} = 1750 mg/kg

103.1.3 Fish

Ictalurus punctatus 96 Hr LC_{50} = 4.9 ppm.
Lepomis macrochirus 96 hr LC_{50} ~ 15.0 ppm

103.1.4 Aquatic Invertebrates

104.0 Hazard Assessment

104.1 Discussion

The following residue estimates were made for broadcast spray:

PPM of Dual to be Expected in Soil

	Depth of Soil (Inches)		
lbs. a.i./A	0.1	1.0	2.0
1.5	33	3.3	1.7
3.0	66.1	6.6	2.2

Maximum Expected Plant Residues (PPM)

lbs. a.i./A	shortgrass	longrasss	Alfalfa
3.0	720	330	175

104.2 Likelihood of Exposure to Non-targets

The acute toxicity of metolachlor to birds and mammals is relatively low and given the rates of application and methods of application (pre-plant incorporated or ground broadcast) contamination of food and habitat should not be acutely hazardous to wildlife.

Testing data also raise little concern over this chemicals hazard to aquatic invertebrates: Daphnia magna 48 hour LC_{50} = 25.1 ppm.

A potential problem does exist for this chemical, however, concerning its tendency to bioaccumulate in fish. Metolachlor is only moderately toxic to fish in acute toxicity terms (5 - 15 ppm - 96 hour) but its stability in soil and water coupled with its bioaccumulative properties require that we access the hazard carefully. Chronic avian and fish studies were requested in previous reviews (T. O'Brien 7/27/77, N. Cook 8/12/75 respectively) but have not been received at the time of this report. The hazard assessment

cannot be completed until this data is received and analyzed.

104.1.2 Endangered Species Considerations

Insufficient data.

105.0 Classification

Insufficient data

107.0 Conclusions

The Environmental Safety Section does not concur with the proposed registration.

Prior to consideration of registration of the proposed use certain basic studies are required:

(a) the avian acute oral LD_{50} for one species of waterfowl (Mallard duck, preferably) or one species of upland game bird (Bobwhite Quail or Ring-necked Pheasant);

(b) the 96-hour LC_{50}'s for a coldwater species (Rainbow trout).

The above basic studies are required on the technical of each active ingredient.

In addition to the basic studies chronic Fish (one species) and chronic avian studies (Bobwhite quail and Mallard duck) were previously requested and will be required for registration of the proposed use.

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