DATE: IN ___3-26-80___ OUT ___9-19-80___

FILE OR REG. NO. _____100-59 7_____

PETITION OR EXP. PERMIT NO. _____

DATE DIV. RECEIVED _____

DATE OF SUBMISSION _____

DATE SUBMISSION ACCEPTED _____

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

DATA ACCESSION NO(S). _____

PRODUCT MGR. NO. ___(23) ~~Stone~~ Ackerman_____

PRODUCT NAME(S) ___Dual 8E_____

COMPANY NAME ___Ciba-Geigy Corp._____

SUBMISSION PURPOSE ___Conditional registration for tank-mix use on railroad____

___rights-of-way_____

CHEMICAL & FORMULATION ___Metolachlor_____

_____

_____

Ontrack[R] 8E (A.I. Metolachlor)

100.0 Pesticide Label Information

100.1 Pesticide Use

Herbicide for weed control on railroad rights-of-way (hereafter referred as ROW).

100.2 Formulation Information

Ontrack[R] 8E contains 86.4% active ingredient (Metolachlor: 2-chloro-N-(2-ethyl-6-methylphenyl)-N-(2-methoxy-1-methylethyl) acetamide)

and 13.6% inert ingredients

Ontrack[R] 8E contains 8lbs. active ingredient per gallon.

100.3 Application Methods, Directions, Rates

Ontrack 8E plus Atratrol[R] 80W or Princep[R] 80W Tank Mix Combination for Railroad Rights-of-way

Use only for control of annual grass weeds or annual broad leaf and grass weeds on railroad rights-of-way.

Broadcast the tank mixture of Ontrack 8E plus Atratrol 80 W or Princep 80W (Princep 4L or Princep Caliber^{TM} 90W)* at rates of 4 pts. plus 6-12.5 lbs., respectively, in sufficient water for thorough ground and plant coverage to control barnyard grass, crabgrass, dogbane, fall pancium, giant foxtails, kochia, little barley, pigweed, ragweed, ripgut brome, Russian thistle, ryegrass, sprangletop, volunteer wheat, wild oats, and witchgrass. Use the lower rates in the rate range for light weed infestations and the higher rates for heavier infestations.

For best results, apply immediately prior to weed emergence. The combination of Ontrack 8E plus Atratrol 80W may also be applied after weeds emerge, but before they exceed 6 inches in height.

Note: Do not spray within 50 feet of lakes, rivers, streams or any other body of water.

*When using Princep 4L or Princep Caliber 90, use equivalent rates. One lb. of 80W equals 1.6 pts. of 4L or 0.9 lb. of Caliber 90.

100.4 Precautionary Labeling

Precautions: Do not use near desirable trees, shrubs, plants or in greenhouses, or injury may occur.

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.

101.0 Physical and Chemical Properties

101.1 Chemical Name

2-chloro-N-(2-ethyl-6-methylphenyl)-N-(2-methoxy-1-methylethyl)acetamide

101.2
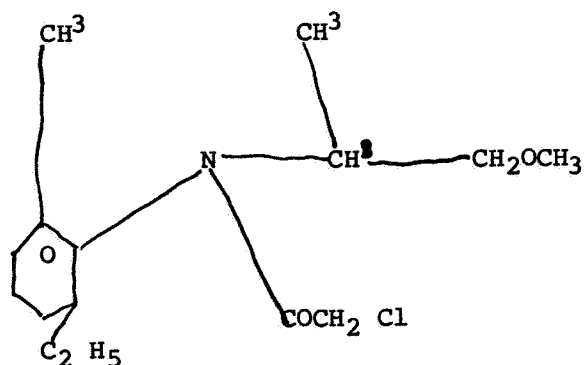
101.3 Common Name

Metolachlor

101.4 Trade Name

Ontrack 8E

101.5 Molecular Weight

283.80

101.6 Solubility

Water   530ppm   @ 20°C

It is miscible with xylene, toluene, dimethyl formamide, methyl cellusolve, butyl cellusolve, ethylene dichloride cyclohexanone. It is insoluble in ethylene glycol and propylene glycol.

102.0 Behavior in the Environment

102.1 Soil

Soil Metabolism/Field Dissipation: Review data indicate that, at a time interval of 12 weeks, aerobic nonsterile and aged aerobic/anaerobic nonsterile test results in a degradation pattern wherein about 18% of the applied was identified as N-(2'-methoxy-1'-methylethyl-2-ethyl-6-methyl-oxanilide). Another 10%

of the initially applied amount was found as polar and water soluble unseparable products, while 41.7% of the total initial amount was found as metolachlor.

The field dissipation study under actual use conditions showed that metolachlor applied alone dissipates to approximately 10% of applied amounts in 60-160 days in various soil types tested, and leaches to approximately 12 inches in loam and silty loam soils.

Mobility

Leaching: Review data show that 20-33% of the applied Metolachlor leaches more than 12" in sandy loam and sandy soils when an equivalent of 20" of rainfall is applied to a soil column. Insignificant leaching is expected in muck soils high in OM. Metachlor residues, aerobically aged for 30 days in soil will also leach in soild low in OM.

Runoff: For the runoff consideration, the following is excerpted from the Metolachlor Generic Standard (p. 26): "During the midspring and early summer months when corn fields contain little or no vegetation to reduce runoff, more than 30% of the erosive rainfall occurs. The average monthly rainfall during April, May and June is approximately 3 inches (USDA Year Book, 1941). This results in greater than 40% of the annual runoff and causes a range 1-3" of water in most of the cornbelt; parts of Southern Illinois, however, lose up to 7 inches of runoff water (EPA-600/2-73-026 a, 1975). A runoff study by Dupre (1974) demonstrated that three simulated rainfalls (totaling 1.5 inches) remove 3.2% of the applied Metolkachlor in runoff water and 1.4% in soil, from an experimental plot with an 8" slope. This study suggests that individual rainfall events of 0.5-3.0 inches may move 1.5% to 2.5% of soil incorporated Metolachlor from a treated field (Personal communication with Environmental Fate Branch, 1978). If Metolachlor is sprayed on the soil surface and not incorporated, the percentage of residues in runoff is expected to be greater than 2.5% for 2.5-3.0 inches of rain. This range of values appears to be reasonable in light of levels observed in field studies for various pesticides (Bailey, Leonard, and Swank, 1976). Both the 6E and 8E formulations of Metolachlor are registered for ground application at a maximum rate of 3 lb. ai/acre. Assuming field application and climatic conditions result in a loss of 2.5% of the applied Metolachlor, then each acre of treated field would contribute 0.075 lbs to an adjacent aquatic site. This amount of active ingredient in an acre foot of water would yield Metalochlor residues of 0.055 ppm in 6 inches of water and .0176* ppm in 12 inches of water."

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*.0176 value is incorrect. This value should be .0276 ppm. P.C., M. Nawar, 9/18/80.

102.2 Water

Small Pond (1 Surface acre, 1 ft. deep)

1. Assume 1/10 in. runoff from a watershed.
2. Assume 3% of runoff of the applied pesticide.
3. Weight of water in the pond at 1 ft. depth equal 2.72×10^6 lbs. Weight of associated hydrosoil (defined here as top 2" of bottom sediment with 1.85 g/cc bulk density) in the pond equals 0.84×10^6 lbs.
4. Assume application rate is 4 lb. ai/a.

5. ASsume pesticide reaching the equilibrium state immediately following its entry into the pond; it will partition between the pond soil and water with Ka value equal to 0.43 (assuring OM of 2.5%).

6. Consequenty calculated pesticide concentration in the pond is 5ppm in the water and 1.52 ppm in the soil.

Stream

The EEG for a stream of 10CFS was simulated by the EXAMS computer model using the following data:

- M. Wt. of Metolachlor......................283.8
- Ka (same as pond)...........................0.43
- Solubility in ppm..........................530
- Calculated EEC in pond water (in ppm) for a 2.5 ft. deep pond was used to generate the loading to 10 CFS stream (assumed to be 2.5 ft. deep). Pesticide runoff loading to stream = 7.5×10^{-2} Kg/hr.

The EXAMS stimulation (sic) yielded the following EEC's in the stream:

(a) in hydrosoil (sediment):
   3.18×10^{-2} mg/kg during loading (i.e. @0 hr)
   3.74×10^{-6} mg/kg 1 hr after loading
(b) in water:
   7.39×10^{-2} mg/l during loading (i.e. @ 0 hr)
   8.7×10^{-6} mg/l 1 hour after loading (i.e. @ 0 hr.)

The half in life in water:

At 20°C	pH = 5, 7, 9,	t1/2 = 200 days
	pH = 13	t1/2 = 97 days
At 50°C	pH = 5	t1/2 = 79
	pH = 9	t1/2 = 139
At 70°C	pH = 5	t1/2 = 10
p	pH = 9	t1/2 = 17

102.3 Residues on Plants
(EFB Memo)

The following maximum residues on plants assuming a single application of Ontrack$^{(R)}$ 8E at a rate of 4 lb ai/a.

Plant types	Max. EEC (ppm)
Short grasses	950
Long grasses	450
Leaves & leafy items	500
Dense foliage	230
Pods contain seeds	50

Photo degradation:

In aqueous solutions: Relatively stable under natural sunlight, about 8% photolysis achieved at 30 days; 93.5% of the recovered was the parent compound.

In soil: in silt loam soil Metolachlor half life is 7-8 days under natural sunlight.

(Behavior in the Environment Profile above was taken from the request information supplied by Environmental Fate Branch. Their reviewer was Ms. M. Nawar. The reviews are dated September 10, 1980, and September 18, 1980).

103   Toxicological Properties

103.1   References from Toxicology Branch

Mammal – Albino Rat Oral LD_{50} =   2780 mg/kg
Mammal – Albino Rabbit Acute Dermal LD_{50} = 10,000 mg/kg

103.2   Minimum Requirements

The following information is taken from the topical summary and disciplinary Review for Metolachlor (June 2, 1980):

Avian Acute Oral LD_{50} and subacute dietary studies with technical Metolachlor

Species	% Active	LC_{50}/LD_{50}	Author	Date	Fulfills Guideline Requirements
Bobwhite quail	tech.	10,000 ppm	Fink	1974	yes
Mallard duck	tech.	10,000 ppm	Fink	1974	yes
Mallard duck	tech.	4640 mg/kg	Fink	1976	no

Acute Toxicity studies on Freshwater fish with technical Metolachlor

Species	% Active	96 hr LC_{50} (ppm)	Author	Date	Fulfills Guideline Requirements
Bluegill sunfish	tech.	10.0	Buccafusco	1978	yes
Rainbow trout	tech.	3.9	Buccafusco	1978	yes
Daphnia magna		25.1	Vikas	1976	yes

103.3 Avian Reproduction

Taken from Henry Craven memo (Sept. 16, 1980) concerning change in Registration Standards on Metolachlor.

"In comparison with the controls, bobwhite quail exposed to 10, 300 and 1000 ppm technical Metolachlor for 17 weeks, produced significantly fewer chicks surviving to 14 days." (Table 1)

"In comparison with the controls, mallard ducks exposed to 10 and 1000 ppm technical Metolachlor for 17 weeks produced significantly fewer chicks surviving to 14 days." (Table 2)

Table 1. Summary of Reproductive Success of Quail Exposed to Metolachlor for 16 weeks

Dietary Pesticide Concentration (ppm)	Percent Survival[1]	Chi-Square[2]	DF	Significance Level
Control	58.8%	-	-	-
10	47.0%	22.35	1	>0.001
300	37.0%	62.4	1	>0.001
1000	41.5%	44.5	1	>0.001

Table 2. Summary of Reproductive Success of Mallards Exposed to Metolachlor for 16-weeks.

Dietary Pesticide Concentration (ppm)	Percent Survival[1]	Chi-Square[2]	DF	Significance Level
Control	57.0%	–	–	–
10	48.0%	11.29	1	>0.001
300	57.6%	0.053	1	NS
1000	51.0%	5.26	1	>0.025

[1] The number of chicks or ducklings surviving to age 14 days expressed as a percentage of the eggs laid.

[2] Chi-square calculated by 2 x 2 contingency table analysis of treatment vs. control group survival.

"However, as concerns reproductive effects in birds, data have indicated reproductive effects at 10 ppm dietary exposure. The presently available exposure information is not sufficient to conclude that a harmful exposure level will occur in Metalachlor treated fields."

103.4 Fish Reproduction Study
(From Registration Standards (6/2/80))

One acceptable reproduction study on technical (97.4%) Metolachlor to Fathead minnow (Pimephales Promelas) was evaluated. Dionne (1978) reported an MATC (maximum acceptable toxicant concentration) of 0.78 1.6 ppm. This value was based on significantly (p=0.05) reduced survival of both the first and second generation fry when exposed to measured concentration 1.6 ppm. The major mortality occurred during the 4th week of exposure. An application factor (AF) was derived by dividing the MATC ranges by the 96 hour flow through for fathead minnows. The resulting values of 0.08 and 0.17 can be used to estimate the MATC for other fish.

104   Hazard Assessment

104.1 . Discussion

Ontrack 8E is designed for use on railroad rights-of-way. The active in this product is Metolachlor. Metolachlor has recently been under registration standards review which was concerned with evaluating field crop uses. Metolachlor on croplands has a use rate of 3 pounds per acre, whereas on railroad rights-of-way, the label simply states 4 pounds without the area defined. (This reviewer assumed, for the benefit of calculations, that this rate was per acre.) Another factor to be considered between these two

use patterns is that the cropland, by necessity, would be a low runoff situation and that railroad rights-of-way would be a higher runoff area. In addition, the cropland uses are for pre-emergent, pre and post-plant and soil incorporated use patterns. The railroad ROW use-pattern is for pre-emergent and post-emergent up to 6 inches in growth.

In order to mitigate some of the expected hazard, the registrant has placed on the label the following statement: "Do not spray within 50 feet of lakes, rivers, streams or any body of water." This statement does not indicate if this is measured distance to the water (Addendum 1). If a trestle is 50 feet above the water, can you spray all the way across the trestle? Do you consider the bank as part of the distance? If so, what is the actual lay off distance? Additional information on this subject was received Sept. 19, 1980. Mr. Joe Rienert's (EFB, HED) memo (9/5/80) indicates that, with the buffer zone, runoff would be reduced to 0.0323 ppm. (Copy of Memo Attached.) He further clarifies the issue in his note on the last page of the memo: "The 96% overall reduction will be an overestimate of the safety value of the buffer zone if either (1) a portion of the chemical which partitions from the runoff into the buffer zone soil can reach the pond via subsurface transport, and/or (2) dense vegetation is present on the buffer zone, reducing the absorption of chemical by the buffer zone."

104.2 Conclusions

If the registrant will agree to the following points EEB will concur with the registration of Ontrack 8E for railroad rights-of-way:

(1) Modify the layoff distance statement as follows:

"Do not spray within 50 feet of lakes, rivers, streams or any other body of water. Do not spray within 25 feet of the beginning or end of a trestle."

(2) Since the label does not indicate amount of area for the unit volume and since our calculations assume 4 pounds active ingredient per acre, the registrant will need to develop a table that will be part of label indicating the amount of material to be used per mile of track based on standard spray widths, so that 4 pounds active ingredient per acre is applied.

<u>Date</u>

Russ Farringer, Wildlife Biologist *Russell Farringer III* 9/24/80
Ray Mathew Head Section 1 *Ray Wi Mathew* 9/25/80
Clayton Bushong, Chief, EEB for *Henry T. Craven* 9/26/80

Addendum 1

Sin θ = opp/hyp.
Cos θ = adj/hyp.
Railroad Track
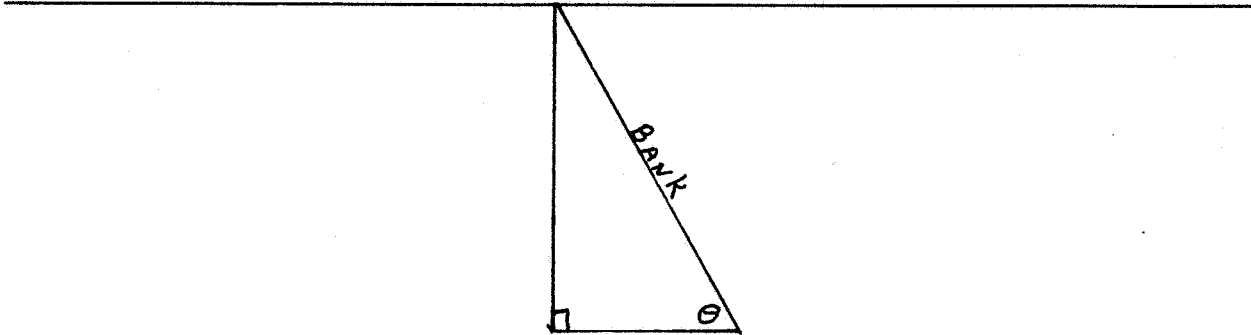
Assumption Bank = 50'

θ	Sin θ	height of bridge
45°	.7071	35.35
35°	.5736	28.68
30°	.5000	25.00
90°	—	50 ft.

Assumption: 1) Average height of bridge is 10 ft.
2) The Beginning of the trestle is supported by a perpendicular to the track support.
3) The water running (stream) or standing (lake or pond) come to the base of the perpendicular support.

(Diagrammatic Not to scale)