UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 20 1994

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Section 18, Oregon Request to Use Oxyfluorfen, Pronamide, Pendimethalin, and Metolachlor on Grass Grown for Seed

FROM: John Tice
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Health Effects Division (7509-C)

TO: Bill Dykstra, Ph.D, D.A.B.T.
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THRU: Mark I. Dow, Ph.D., Section Head
Special Review and Registration Section II
Occupational and Residential Exposure Branch
Health Effects Division (7509-C)

Larry Dorsey, Chief
Occupational and Residential Exposure Branch
Health Effects Division (7509-C)

Please find below, the OREB review of:

DP Barcode: D-203685, 203703, 203697, 203691

Pesticide Chemical Code: 111601, Oxyfluorfen; 101701, Pronamide; 108501, Pendimethalin; 108801, Metolachlor

EPA Reg. No.: Goal 1.6E, 707-174; Prowl 3.3EC, 241-337; Kerb 50W, 707-159; Dual & Dual 8E, 100-673, 100-597

EPA MRID No.: N/A

PHED: PHED version 1.01 used for exposure estimates, run 4 and 24 for mixer/loader and applicator respectively.

REFERRED TO TOX I FOR RISK ASSESSMENT

Recycled/Recyclable
Printed with Soy/Canola Ink on paper that contains at least 50% recycled fiber

I. INTRODUCTION:

Background/Purpose

The State of Oregon has requested Emergency exemption to use 4 herbicides to control weeds in grass grown for seed. The unprecedented request for four herbicides is based on the idea that no one herbicide will control "weed" in all varieties of grass, and that all four herbicides are needed. Grass is treated by conventional ground equipment either by the landowner or a custom applicator. All treatments are during the "winter" or rainy season. Most applicators with traditional open cab tractor, due to the weather, wear insulated coveralls, hats, and some wear rain pants. Those that can afford closed cabs, use them for warmth and protection from the elements.

II. DETAILED CONSIDERATIONS:

A. Use

Oregon grass seed farmers must maintain a mono-culture of grass in order to ensure certification of their fields and receive the best price for their seed. In discussions with three area experts[1], farms range in size from the smallest of 200 acres to a maximum (corporation) farm size of 9,000 acres. Most large farms range in size from 1500 to 3000 acres. Having a 2500 - 3000 acre farm, spray requirements and spraying time mandates hiring another person to do some or all of the spray work. For this reason, OREB will use the 3000 acre as a large size farm to calculate exposures.

The Section 18 requests the use of 4 herbicides. Each herbicide has a specific use for specific crops (varieties of grass) and timing. Many different herbicides are typically used in different times, for different pests and crops. For this reason, OREB will assume that each herbicide will be used on 25% of the 3000 acres. That is a farmer raising grass seed on 3,000 acres will use each of the four herbicides on 750 acres.

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[1] Personal communications with Dr. Ronald Burr, 503-769-3416, Ag. Research, Inc. an agricultural consultant to Grass Seed Farmers; Mr. Craig Burger, 503-754-7029, A commercial applicator and private farmer; Dr. Mark Millbye, 503-967-3874 (X-2394), Ag Extension Specialist in grass seed production.

Commercial applicators start their season in mid September and end around the middle of June. Commercial applicators can (and do) make herbicide applications to as many as 12,000 acres a year. Many applications include tank mixes with fertilizers and fungicides. Because applications are made in the "rainy and winter" season, most applicators use insulated coveralls and many put rain pants over the coveralls. This is done for warmth as well as protection from chemicals.

B. Toxicology concerns

The toxicological concerns for the chemicals are as follows:

- GOAL (oxyfluorfen); group C carcinogen, quantifiable as well as developmental concerns,
- DUAL (metolachlor); group C carcinogen, quantifiable,
- PROWL (pronamide); group B-2 carcinogen and developmental concern, and
- KERB (pendimethalin); group C carcinogen without quantification.

C. Detailed exposure calculations

Exposure calculations are based on the following assumptions:

- Average worker has the mass of 70 kg for Dual and Kerb, for Goal and Prowl with developmental concerns the mass will be 60 kg,
- mixer/loader and applicator can not be the same person, to treat the acreage assumed, a helper is mandatory,
- respiratory exposure is negligible compared to dermal exposure,
- dermal exposure is not adjusted for dermal absorption,
- work clothing worn includes protective gloves, long sleeved shirts, long pants, shoes, and socks worn under coveralls, and hat.
- in one day a single person will mix/load or spray a maximum of 300 acres at the rates listed in the exposure table,

- the maximum application rate (listed in the table) is used during each applications.

The following table summarizes daily and annual exposures for mixer/loader, applicator, and commercial applicators, using an open pour loading system or open cab ground boom spray equipment.

The following equations are presented as sample calculations to show how the exposure calculations are performed.

$$Lbs\ Handled = Application\ Rate * Acres\ Treated$$

$$Daily\ Exposure = \frac{Exposure\ Factor * Lbs\ Handled}{60kg\ (Goal\ and\ Prowl)\ or\ 70kg\ (Dual\ and\ Kerb)}$$

$$Yearly\ Exposure = \frac{Daily\ Exposure * Application\ Days/Yr}{365}$$

CHEMICAL	APP. RATE (lbs/A)	ACRES/DAY	LBS. HANDLED	DAILY EXP (μg/kg/day)	DAYS/YR (days)	YR EXPOSURE (μg/kg/day)
APPLICATOR EXPOSURE FOR HERBICIDE APPLICATION TO 3,000 ACRES (24.93 μg/lb applied)						
GOAL (oxyfluorfen) [D]	0.357	300	107.10	44.50	2.5	0.30
DUAL (metolachlor)	2.0	300	600.00	213.69	2.5	1.46
PROWL (pronamide) [D]	2.88	300	864.00	358.99	2.5	2.46
KERB (pendimethalin)	0.357	300	107.10	38.14	2.5	0.26
EXPOSURES ASSOCIATED WITH MIXING/LOADING HERBICIDES FOR 3,000 ACRES (20.1 μg/lb handled)						
GOAL (oxyfluorfen) [D]	0.357	300	107.10	35.88	2.5	0.25
DUAL (metolachlor)	2.0	300	600.00	172.29	2.5	1.18
PROWL (pronamide) [D]	2.88	300	864.00	289.44	2.5	1.98
KERB (pendimethalin)	0.357	300	107.10	30.75	2.5	0.21
COMMERCIAL APPLICATOR EXPOSURE FOR HERBICIDE APPLICATION TO 12,000 ACRES (24.93 μg/lb applied)						
GOAL (oxyfluorfen) [D]	0.357	300	107.10	44.50	10	1.22
DUAL (metolachlor)	2.0	300	600.00	213.69	10	5.85
PROWL (pronamide) [D]	2.88	300	864.00	358.99	10	9.84
KERB (pendimethalin)	0.357	300	107.10	38.14	10	1.04

D signifies a developmental effect, 60 kg body weight is used for calculations.

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III. CONCLUSIONS:

Daily exposure estimates for a mixer/loaders, applicators and commercial applicators are presented above. It is important to note the exposure estimates were based on the fact the workers wore coveralls over long sleeved shirt, long pants, socks, shoes and gloves. The labels submitted with the application do not comply with the worker protection standard. Additionally, some of the labels are silent about the required protective clothing for workers. Considering the application season and anticipated weather, the requirement for wearing coveralls is not unrealistic and should be stipulated.

cc: Correspondence File
111601, Oxyfluorfen
101701, Pronamide
108501, Pendimethalin
108801, Metolachlor

YSNG(BEAD) Estimate of Spray time/acres by Various Application Methods 06/16/94

Site: OREGON GRASS SEED Chem: 4-HERBICIDES Acre: 400.0
Appl. method: GROUND Speed: 10.0 (increment: 5) mph
Tank capacity(TC): 500 (Increment: 50) gal Length of run(LR): 1500 ft.
Swath width(SW): 52 (Increment: 10) ft. Water station(WS): 5000 yd.
Finish spray(FS): 10 (Increment: 5) gal/a. Refill time(RT): 2.5 min
** Recommand: Ground -- RT = 2-3 mins. per 100 gal TC; LR = 1000 ft; **********
WS = varies; Ferry speed = speed * 2.0; Turning time = 0.25 min.

500 TC	10.0 mph				15.0 mph				20.0 mph				time in mins
FS	10	15	20	25	10	15	20	25	10	15	20	25	<- Finish spray
52	400	400	400	400	400	400	400	400	400	400	400	400	<- Acre treated
SW 52	380	380	380	380	253	253	253	253	190	190	190	190	<- Spray time
52	100	150	200	250	100	150	200	250	100	150	200	250	<- Refill time
52	211	289	367	445	159	211	263	315	133	172	211	250	<- Ferry/turn time
FS	10	15	20	25	10	15	20	25	10	15	20	25	<- Finish spray
62	400	400	400	400	400	400	400	400	400	400	400	400	<- Acre treated
SW 62	319	319	319	319	212	212	212	212	159	159	159	159	<- Spray time
62	100	150	200	250	100	150	200	250	100	150	200	250	<- Refill time
62	202	280	358	436	150	202	254	306	124	163	202	241	<- Ferry/turn time