UNITED STATES ENVIRONMENTAL PROTECTION AGENCY 3125-GGN
WASHINGTON, D.C. 20460

OFFICE OF PESTICIDES AND TOXIC SUBSTANCES

August 26, 1981

MEMORANDUM

FROM: Review Section No. 1
Environmental Fate Branch, HED

TO: Chief, Ecological Effect Branch
Hazard Evaluation Division

THRU: Chief, Review Section No. 1 SMC for WG
Environmental Fate Branch, HED

ATTENTION: L. Touart

Attached find environmental fate information and/or EEC(s) requested for:

Chemical: Oftanol

Product Name: Amaze

Use Pattern for EEC Calculations: Turf

Date in: 8/20/81

Date out: 8/26/81

EEC/EFP#: 101

E. Regelman, Chemist
Section 1, EFB/HED

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INTRODUCTION:

Since we do not currently have a standard scenario for turf, two alternate scenarios were used to cover the range of use situations expected.

DISCUSSION

Isofenfos is registered for use on turf in a variety of formulations (e.g. Oftanol® 1.5% Granular INSECTICIDE, Scotts® ProTurf Brand (2% granular), Oftanol® 5% Granular INSECTICIDE, etc.). It is applied by ground spreader, up to three times per season, at rates of up to 2 pounds active per acre. Following application of the granular, the labels recommend light watering to wash the insecticide from the turf into the root zone.

ASSUMPTIONS:

1. This insecticide is surface applied at 2 lb ai/A and lightly washed into the root zone (upper 0.1" of soil)
2. Three successive applications are made during a season, on June 1, July 1 and August 1 (at approximately 30 day intervals).
3. A severe runoff event occurs soon after the 3rd application.
4. Projected residues from the first two applications are adjusted downward, over the 60 and 30 day intervals between the 1st/2nd applications and the 3rd application, respectively. Then the accumulated residues are summed to give a "theoretical" application which is equivalent to the three separate applications. For scenario #1, the "theoretical" application rate was estimated to be about 5.14 lb ai/A. For scenario #2, the "theoretical" application rate was estimated to be about 4.39 lb ai/A.
5. For a "typical" golf course, the treated area was assumed to be about 7000 yards long by an average of 50 yards wide, about 72 acres in all.
6. Total size of the drainage basin was assumed to be about 100 acres, which would include wooded areas, etc.
7. In the center of this drainage basin, there is a one acre pond, with an average depth of two feet.
8. There is no buffer zone surrounding this pond.
9. Application is by ground equipment, so that there is no drift component, as well as no direct application to the water.

10. For the entire watershed, the Sediment Delivery Ratio[1] (representing the average amount of runoff and the percent of applied chemical which reaches the pond) was assumed to be equal to $CA^{-0.2}$, where "C" is a constant, and "A" is the basin area, relating the amount of runoff sediment which reaches a given point to the area of the drainage basin where the runoff event occurred. While not directly applicable to chemical movement for relatively water-soluble pesticides like oftanol, there is evidence[2] that, even for completely soluble compounds, the percent of applied chemical removed from treated fields via runoff is inversly proportional to field size. "C" was assumed to be the maximum "edge of field" values: 5% for oftanol, and one inch for the runoff itself. Using the above equation, we calculate that for the entire watershed, 1.99% of the oftanol applied will reach the pond in a severe, worst-case runoff event, which produces an average of 0.398 inches of runoff from the total drainage basin.
11. For scenario #1, the pond hydrosoil was assumed to contain 2.9% organic matter (from turf growing on sandy clay loam soil). Half-life for oftanol in this soil was reported[5] to be 127 days. The K_d for this hydrosoil was estimated (according to Chiou[3]) to be 33.79, based on the water solubility of 30 ppm at 20°C.[4]
12. For scenario #2, the pond hydrosoil was assumed to contain 1.8% organic matter (from turf growing on silty loam soil). Half-life for oftanol in this soil was reported[5] to be 59 days. The K_d for this hydrosoil was estimated (according to Chiou[3]) to be 14.77, based on the water solubility of 30 ppm at 20°C.[4]
13. Calculations were performed with the HR259 program. Summary printouts are attached.

RESULTS:

The maximum EEC in the pond water under the conditions delineated in the two scenarios above were estimated to be about 0.21 and 0.23 ppm, respectively. The depth of the pond after the severe runoff event was projected to have increased from 2 feet to about 5.3 feet.

REFERENCES

1/ Control of Water Pollution from Croplands, Vol. II. ORD-EPA/ARS-USDA, June, 1976.

2/ Trichell, D.W., et al. Weed Sci. 16: 447 (1968)

3/ Chiou, C.T., et al. Science 206: 831 (1979).

4/ Brussell, G.E., Manager, Mobay Chemical Co., letter to PM 16 (W.H. Miller) on 6/15/81.

5/ Appleton, Henry. EFB/HED. EEC review of "turf, field crop (corn)". Memorandum to Chief, EEB on 10/9/81.

SCENARIO #1		SCENARIO #2	
23.79	KD*	14.77	KD*
5.14	LB/A	4.39	LB/A
72.	A TR	72.	A TR
1.99	% RO	1.99	% RO
0.	D LD	0.	D LD
100.	B SZ	100.	B SZ
0.398	R/D	0.398	R/D
1.	H2OA	1.	H2OA
2.	DPTH	2.	DPTH
3.0979	WC-W	3.3906	WC-W
4.2667	WC-H	2.8993	WC-H
5.0916	EECH	3.4598	EECH
0.2140	EECW	0.2342	EECW
5.3215	DPTH	5.3215	DPTH