FEB 10 1981

To: Chief, Ecological Effects Branch
Hazard Evaluation Division

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

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

Chemical: Chlorothalonil

Product Name: Bravo 500

Use Pattern for EEC Calculations: Soybean

Date in: 1/23/81

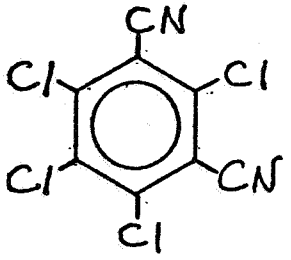
Date out: FEB 10 1981

EEC/EFP#: 44

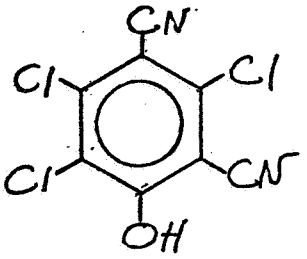
TAIS (level II)	Days
63	2

EEB has requested EFB to estimate an environmental concentration of chlorothalonil and its major degradate, DS3701, resulting from proposed use on soybeans. A standard soybean scenario was used, as requested.

Chlorothalonil (2,4,5,6-tetrachloroisopthalonitrile)



DS3701 (4-hydroxy-2,5,6-trichloroisopthalonitrile)



A. The concentration of chlorothalonil resulting in a pond adjacent to a soybean field receiving aerial chlorothalonil treatments was calculated using the following inputs and assumptions;

a. The pond was 2.471 acres in surface area and 2 m deep. The pond drained an area of 5 acres - all of which was treated with chlorothalonil (a non - treated border area was not factored in).

b Chlorothalonil was applied three times at 14 day intervals by airplane at a rate of 1.433 lb/acre. Initially, a 200 foot border strip around the pond was not treated. According to EFB standard spray drift scenario, this gives a drift load to the pond of 4 mg m^2 per application (Reinert, 1980).

c. The degradation half-life for Chlorothalonil is chosen to be 14 days. Chlorothalonil is assumed not to degrade in pond water. The K_d is 32 (calculated from 0.6 ppm water solubility for a hydrosil containing 0.5% organic matter).

d. Immediately after the third application (28 days after the first application), 2.5116 lb per acre of chlorothalonil is found. At this time, a severe run-off occurs giving an inch of runoff and a 0.1% runoff of chlorothalonil (guesstimated from data for toxaphene in Wauchope, 1978) into the pond.

The TI 59 program calculates the following lentic concentrations of chlorothalonil in the pond:

Water 10 ppb
Hydrosoil 190 ppb

B. To obtain an EEC for the principal soil degradate of chlorothalonil DS3701, it was determined from our files that approximately 20% of applied chlorothalonil is converted to DS 3701. Therefore, the above treatment will give an eventual soil burden of DS3701 of 0.86 lb/acre. DS 3701 can reach the pond only by runoff. The K_d of DS3701 was assumed to be 3.2. DS 3701 is stable in the pond. Runoff events result in a 5% runoff of the degradate.

With these inputs, EEC's are
Water 4 ppb
Hydrosil 13 ppb

C. EEC calculations were not done for the stream scenarios because, after discussion with D. Reider of EEB, it was agreed that dilution by the moving water would greatly lessen the concentrations observed.

D. Final note: Sample calculations showed that the drift load is by far the most important input to the pond load of chlorothalonil. The two-hundred foot distance drift data used in A. above is the closest data we have to the pond edge. It is expected that the pond edge will increase exponentially as the pond edge is approached by the plane. Since this will drastically increase the EEC, EEB may wish to consider including a protecting border strip around water in their recommendations.

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Henry Appleton
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Literature cited

Reinert, Joe C. 1980, "Estimating the Maximum Concentration of Pesticides in the Environment as a consequence of specific Events" EFB/HED OPP/EPA

Wauchope R. D., 1978, J. Environ. Qual. 7 :459