109701

FILE

Date Out EFB: 13 DEC 1984

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TO: H. Jamerson
Product Manager 43
Registration Division
TS-767

FROM: Samuel M. Creeger, Chief
Review Section No. 1
Exposure Assessment Branch
Hazard Evaluation Division

Attached please find the environmental fate review of:

Reg./File No.: 4E 3113

Chemical: Permethrin

Type Product: Insecticicde

Product Name: Ambush

Company Name: ICI Americas

Submission Purpose: Referral from RCB requesting opinion in aquatic residues resulting from use on watercress

Date in: 10/29/84

Date Completed: 12/12/84

ACTION CODE: 204

EFB # 5127

TAIS (level II)	Days
51	2

Deferrals To:

XXXXXX Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

1.0 INTRODUCTION

RD had requested that EAB comment on the RCB deferral to EAB concerning possible contamination of potable and irrigation water supplies from the proposed registration of AMBUSH®, EPA Reg. No. 10182-18 (permethrin, as a. i.) for use on watercress.

1.1 Chemical

See previous reviews of chemical information

2.0 DIRECTIONS FOR USE

Apply Ambush® at rate of 0.125 lb. ai/acre. Apply at weekly intervals. Do not make more than 4 foliar applications per crop. Do not harvest within 3 days of last application.

3.0 DISCUSSION

3.1 EAB does not have sufficient data upon which to determine the environmental fate of residues of permethrin resulting from the application of AMBUSH® to watercress.

Data available indicate that permethrin is stable to hydrolysis but is unstable to aqueous photolysis. However, the rate cannot be extrapolated from the data since the experiments were conducted with activators or inhibitors.

Permethrin is strongly adsorbed to soil with adequate amounts of organic matter. Adsorption (K values) were 0.386 for a fine sand soil (1.7% organic matter) to 633 for a clay loam soil (5.2% organic matter). Run-off of permethrin has been shown to be a problem and was probably due to physical transport of permethrin-adsorbed soil particles by soil erosion.

In the aquatic metabolism study (the previous review does not state but presumably aerobic) permethrin parent compound disappeared relatively rapidly in all waters tested (the natural waters of the Blackwater, Loddon and Thames Rivers). With the decline of parent permethrin, there was an increase in degradation products phenoxybenzyl alcohol and phenoxy benzoic aicd and dichlorovinyldimethylcyclopropanecarboxylic acid (DCVA).

Parent permethrin was also adsorbed out of aqueous phase by the presence of sediment. However, the experiment was too short in duration to determine the adsorption of the degradates by sediment. The study did indicate that water samples in the aquatic field study should have been analyzed to determine the presence or absence of DCVA in water.

The aquatic field dissipation study was found to be inadequate in that the applicant failed to determine the possible presence of degradation products. However, the results of this study (a pond study associated with the cotton use) would not be relevant to this aquatic use since watercress is grown partially submerged in shallow pools, springs and brooks with running water.

Concerning non-target organisms, no conlusion could be drawn from the study regarding the whole body burden in the fish, mussels or crayfish for the isomers of permethrin. Also, there could be no conclusions regarding the accumulation of known soil or photolytic degradation products of permethrin. Other fish accumulation studies have shown that non-edible portions of fish accumulate significant amounts of radioactivity assumed to be parent compound, but the radioactivity may just as well be the degradates of permethrin rather than the parent isomers.

3.2 For the proposed use, we note that most of the applied permethrin will be intercepted by the watercress foliage. Therefore, water leaving the watercress bed will contain much higher levels of permethrin residues when application would be followed by rain where the rain would wash the residues off the foliage. Also, the flow of water will vary with location and slope of the field, surface drainage, seasonal rainfall, etc. Thus, it is likely that residues of premethrin will be dispersed in the flowing water.

4.0 CONCLUSIONS

4.1 Since aquatic dissipation data are not available for the use of permethrin on watercress, EAB must assume there will be a potential for contamination of potable water supplies and irrigated crops. There is no indication that water leaving permethrin-treated watercress fields will not enter potable water supplies or not be used to irrigate other crops. Based on the presentation by the major U. S. watercress grower, we would expect permethrin contaminated water to leave the treated field.

4.2 There could also be a hazard to aquatic non-target organisms. EAB defers to EEB concerning the potential for toxicity to non-target aquatic organisms resulting from the proposed use.

Clinton Fletcher
Review Section No. 1
Exposure Assessment Branch
Hazard Evaluation Division