#652 BB

109701

Date Out EAB: 22 OCT 1984

TO: T. Gardner
Product Manager 17
Registration Division
TS-767

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

Attached please find the environmental fate review of:

Reg./File No.: 279-3014

Chemical: Permethrin

Type Product: Insecticiide

Product Name: Pounce 3.2EC

Company Name: FMC Corporation

Submission Purpose: Add use use on filberts

ZBB Code: ?

ACTION CODE: 335

Date in: 8/24/84

EFB # 4546

Date Completed: 10/22/84

TAIS (level II)	Days
63	1

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

1.0 INTRODUCTION

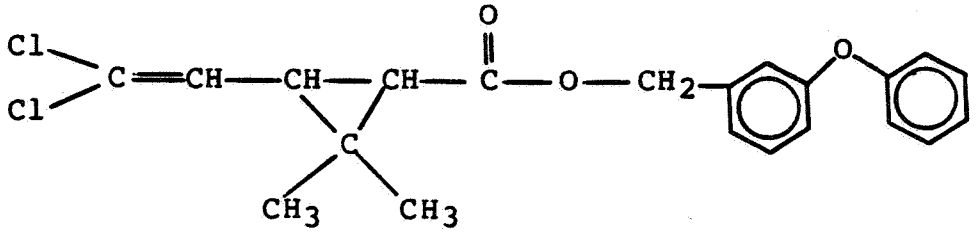
FMC Chemical Co. has submitted an application for the registration of Pounce® 3.2EC Insecticide (permethrin as a. i.) for use on filberts.

1.1 Chemical

Common name: Permethrin

Chemical name: (3-phenoxyphenyl)methyl (±)-cis,trans-3-(2,2-dichloroethenyl)-2,2-dimethyl cyclopropane carboxylate

Chemical structure:



2.0 DIRECTIONS FOR USE

The complete label is attached. Briefly, apply Pounce® 3.2EC at a rate of 8-16 ounces (0.2 to 0.4 lb a. i.) per acre. Do not apply more than 1.6 lbs. ai per acre. per season.

3.0 DISCUSSION OF DATA

No additional data were included in the current submission. Previously submitted data were considered in the review dated 7/31/78 for the registration of Ambush® (permethrin as a. i.) for use on cotton. Also, additional data were considered in reviews dated 5/15/78, 6/9/76, and 4/16/76.

Conclusions of the data were:

Hydrolysis: . Permethrin is stable to hydrolysis at expected environmental conditions. At elevated temperature and unlikely pH (>9) the half-life exceeded 50 days. The hydrolysis degradation products are 3-phenoxybenzyl alcohol and cis/trans 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylic acid (cis/trans-DCVA). Both appear to be stable to further hydrolysis.

Chemical hydrolysis is not expected to be a significant pathway of dissipation of permethrin in the environment.

Photodegrdation- Permethrin is unstable to photolysis, but the rate cannot be extrapolated from the data since the experiments were conducted with activators or inhibitors. The photodegradation on soil showed as much unaccountable losses as degradation. Photolysis of separated isomers leads to isomerization, followed by cleavage of the ester linkage yielding 3-phenoxy-benzyl alcohol and cis/trans-DCVA. A secondary pathway was also apparent.

Metabolism- Permethrin degrades in soil under laboratory conditions with dependency upon soil type, temperature, and oxygen availability. The rate is slower in soils low in organic matter content (<1.5%) and in soils under anaerobic or flooded conditions. The lack of degradation in sterile soils indicate that the degradation is a function of the presence of soil microorganisms.

The degradation products in soil are primarily 3-phenoxy benzoic acid, 3-phenoxybenzyl alcohol and cis/trans-DCVA. All appeared to be transitory in the soil. It was noted that the cis-isomer of permethrin is generally more stable than the trans-isomer.

Note: It appears the half-life(lives) were presented in the study but not recorded by the reviewer. The reviewer notes that the reported half-life was for permethrin only and did not consider the dissipation of the degradates or non-extractable material. In three sandy clay loam and a loamy sand soils, the half-life estimate indicated that 50% of the applied ^{14}C would be evolved as $^{14}CO_2$ within 10 weeks. Under waterlogged conditions, $^{14}CO_2$ evolved less rapidly--approx. 15% in 14 weeks.

Mobility- Permethrin does not leach significantly in soil. 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). Permethrin is strongly adsorbed to soil with adequate amounts of organic matter. Desorption was not investigated.

The reviewer concluded the degradates of permethrin are somewhat more leachable than the parent compound but do not appear to be a problem. Slower degradation in coarse soils may lead to more leaching of residues. Runoff of permethirn has been shown to be a problem and was probably due to physical transport of permethrin-adsorbed soil particles by soil erosion.

Field Dissipation- The reviewer concluded that all the submitted field dissipation data are inadequate. The applicant failed to determine the possible presence of degradation products. Also, the difference in apparent rate of dissipation in various soil types as shown in the laboratory metabolism studies has not been verified (or denied) by the field data.

Accumulation: Catfish, in a static accumulation study, had a maximum bioaccumulation factor of 12-13X (muscle tissue) and 147X (viscera) reached over a period of 10 days and 14 days exposure, respectively, then declined afterward. During the 14 day depuration period, there was a 66% decline in residues in muscle tissue and 90% decline in viscera.

In a dynamic study flow-through using both catfish and bluegill sunfish, the maximum bioaccumulation factors were 21X and 715X for residues in bluegill edible and non-edible tissue, respectively, after 21 to 28 days exposure. In catfish, the maximum bioaccumulation factors were 91 and 703 in edible and non-edible tissues, respectively, after 28 days exposure. During the 14 day depuration period, residues declined 92 and 97% in bluegill edible and non-edible tissues, respectivley. In catfish, residues declined 64 and 84% in edible and non-edible tissues, respectively, during the depuration period.

In another study, it was noted that the female fathead minnow accumulated significantly more permethrin residues than the males in the non-edible tissues. The possibility of reproductive problems in fish may be of concern.

The reviewer concluded that the extremely low water solubility of FMC 33297 (permethrin) could lead to accumulation hazard in fish. The chemical identity of the residues in fish was not examined.

Rotational crops- The laboratory study showed that after four months (longest period tested) residues were still present in rotated crops. The field rotational crop study did not identify a time interval at which subsequent crops will not contain permethrin residues. The analytical method was found inadequate for determining permethrin and its degradates in field rotational crop samples.

4.0 RECOMMENDATION

4.1 Adequate environmental fate data are not available to define the environmental fate of Pounce® 3.2EC (permethrin) for the proposed use on filberts.

4.2 The field dissipation studies are deficient in that soil was not analyzed for residues of the degradation products, namely 3-phenoxybenzoic acid and cis/trans-DCVA. These data are now needed to support registration of additional uses of permethrin even though previous registration applications were approved.

4.3 Deficiencies in the rotational crop data are not relevant to the proposed use on filberts.

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

Code 3510

Net Contents

RESTRICTED USE PESTICIDE

For retail sale to and use only by certified applicators or persons under their direct supervision, and only for those uses covered by the certified applicator's certification.

Pounce® 3.2 EC

Insecticide

EPA REG. NO. 279-3014 EPA Est., 279-FL-1

ACTIVE INGREDIENTS:

*Permethrin**	38.4%
INERT INGREDIENTS:*	61.6%
	100.0%

*(3-Phenoxyphenyl) methyl (±) *cis-trans* 3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate
**cis/trans* ratio: Max. 55% (±) *cis* and min. 45% (±) *trans*
***Contains xylene range aromatic solvents.

Contains 3.2 pounds permethrin per gallon.

U S. Patent No. 4,024,163

KEEP OUT OF REACH OF CHILDREN

CAUTION

For Emergency Assistance Call 716-735-3765.

See other panels for additional precautionary information.

FMC

FMC Corporation
Agricultural Chemical Group
2000 Market Street
Philadelphia Pennsylvania 19103

First Aid:

If in eye: flush eyes with water for 15 minutes. Call a physician.

If swallowed: do not induce vomiting. Call a physician.

If on skin: remove contaminated clothing. Wash with plenty of soap and water. Get medical attention if irritation persists.

Note to Physician: Vomiting should be supervised by a physician or the professional staff because of the possible pulmonary damages by aspiration of the solvent.

PRECAUTIONARY STATEMENTS

Hazards to Humans (& Domestic Animals)

CAUTION

Harmful if swallowed or absorbed through skin. Causes moderate eye irritation. Avoid contact with eyes, skin or clothing. Wash thoroughly after handling. Remove and wash clothing before reuse.

Environmental Hazards

This product is highly toxic to bees exposed to direct treatment or residues on crops or weeds. Do not apply this product or allow it to drift to crops or weeds on which bees are actively foraging. Additional information may be obtained from your Cooperative Extension Service.

This product is extremely toxic to fish. Use with care when applying in areas adjacent to any body of water. Do not apply directly to water. Do not apply when weather conditions favor drift from treated areas. Do not contaminate water by cleaning of equipment, or disposal of wastes.

Physical or Chemical Hazards

Do not use or store near heat or open flame.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

Do not apply this product in such a manner as to directly or through drift expose workers or other persons. The area being treated must be vacated by unprotected persons.

Do not enter treated areas without protective clothing until sprays have dried.

Protective clothing means, at least, a hat or other suitable head covering, a long sleeved shirt and long legged trousers or a coverall type garment (all of closely woven fabric covering the body, including the arms and legs), shoes and socks.

Because certain states may require more restrictive reentry intervals for various crops treated with this product, consult your State Department of Agriculture for further information.

Written or oral warnings must be given to workers who are expected to be in a treated area or in an area about to be treated with this product. Inform workers of areas or fields that may not be entered without specific protective clothing, period of time field must be vacated and appropriate actions to take in case of accidental exposure. An example of such information is given under written warnings. When oral warnings are given, warnings shall be given in a language customarily understood by workers. Oral warnings must be given if there is reason to believe that written warnings cannot be understood by workers. Written warnings

FILBERTS: To control Filbertworm and Oblique Banded Leafroller - Use Pounce 3.2 EC at a rate of 8-16 ounces (0.2 to 0.4 pounds active) per acre. Apply when insects appear. Do not apply more than 1.6 lbs ai per acre per season. Apply in a minimum of 15 gallons of finished spray per acre by aircraft or 20 gallons of finished spray per acre with ground equipment. Do not apply within 14 days of harvest. Do not graze livestock in treated orchards.