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

6/2/87

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

Memorandum

Subject: 87-GA-02. Proposed Section 18 for the Use of
Permethrin (Pounce® 3.2 EC, EPA Reg. No. 279-
3014; Ambush, EPA Reg. No. 10181-18) on Southern
Cowpeas.
No Accession Number / No MRID Number
RCB #2273

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To: Emergency Response and Minor Use Section
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and

Toxicology Branch
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The Georgia Department of Agriculture requests a Section 18 Specific Exemption authorizing application of the pesticide permethrin (Pounce® 3.2 EC, 3.2 lbs.a.i./gallon emulsifiable concentrate; Ambush®, 2 lbs.a.i./gallon) to control cowpea curculio on Southern peas harvested in the succulent stage for fresh market or for canning and freezing purposes. Applications would be made to approximately 30,000 acres of peas throughout Georgia.

Numerous tolerances have been established for permethrin and its metabolites. A tolerance of 0.5 ppm has been established for residues of permethrin per se on cottonseed. Tolerances for residues of permethrin, 3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropane carboxylic acid (DCVA) and 3-(phenoxybenzyl) alcohol (3-PBA) are established on a variety of plant commodities and range from 0.05 ppm (apples, potatoes) to 60 ppm (corn forage and fodder). Tolerances for residues of permethrin, DCVA, 3-PBA and 3-phenoxybenzoic acid are

established for animal commodities and range from 0.05 ppm (eggs) to 3.75 ppm (milk fat). Numerous tolerances are pending. A Registration Standard has not been completed for Permethrin.

The proposed use includes an unspecified ("usually 5") number of applications of permethrin at 3-5 day intervals at a rate of 0.1 lbs.a.i./A/application. Applications would begin at bloom and proceed until 5 days prior to harvest. Applications could be made using ground or aerial equipment; and the following restriction would be included on the Section 18 label:

"Do not graze livestock in treated areas or feed treated plant parts."

The major metabolic pathway in plants includes hydrolysis of the ester bond. The residue of concern in plants includes parent permethrin plus the hydrolysis products DCVA and 3-PBA. In animal tissue, oxidation of 3-PBA to form 3-phenoxybenzoic acid can occur. The residue of concern in animals includes permethrin per se, DCVA, 3-PBA and 3-phenoxybenzoic acid.

Residue data are available for snap beans and for shelled peas. The analytical methods used to generate these data are modifications of ICI's GRAM-1 or GRAM-1/1 methods (permethrin), and GRAM-5/2 method (3-PBA and DCVA). These methods and modifications were discussed in conjunction with PP#3E2915 (Acc. No. 071709; V. Frank Boyd, 12/9/83) and PP#4E2972 (P. Errico, 4/23/84). Briefly, GRAM-1/1 involves acetone/hexanes extraction, clean-up using acetone and water washes, gel permeation chromatography and florisil, and GLC using an electron capture detector. GRAM-5/2 involves acetonitrile/acetone extraction, partitioning with dichloromethane, acid hydrolysis, derivatization of DCVA to the 2,2,2-trichloroethyl ester and 3-PBA to the heptafluorobutyl ester, and capillary GLC using an electron capture detector.

Recoveries of permethrin ranged from 60-143% at fortifications of 0.02 - 7.5 ppm, for 3-PBA ranged from 59 - 120% at 0.05 - 1.0 ppm fortification levels, and for DCVA ranged from 66.4 - 118.3% at 0.1 - 1.0 ppm fortification levels. Control values ranged from <0.01 - 0.2 ppm.

Residue data reflecting applications at 0.1 lbs.a.i./A/application are summarized in the Table on the next page for snap beans and shelled peas. No data are available for Southern peas or for peas with pod (shell). Additionally, no data are available reflecting the proposed 3-day interval between applications. Considering these deficiencies in the residues data, the 1.0 ppm maximum residue level proposed with this Section 18 is inappropriate. Rather, we conclude that combined residues of permethrin and its metabolites in or on Southern peas will not exceed 2.0 ppm as a result of the proposed use.

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Residues of Permethrin and Its Metabolites in or on Peas and Beans

<u>Commodity</u>	<u>Number of Applications</u>	<u>PHI (days)</u>	<u>Residue Range (Combined Residues, ppm)</u>
Snap beans	4	0	0.65
		1	0.63
		3	0.05 - 0.74
		7	0.32
		14	0.27
	5	0	0.79
		1	0.66
		3	0.38 - 0.78
		7	0.90
	7	3	0.10 (2 samples)
	10	0	0.37
		1	0.46
		3	0.32
		7	0.53
<u>Shelled peas</u>	4	0	0.04 - 0.34
		1	0.04 - 0.40
		3	0.04 - 0.52

RCB will not estimate residues of permethrin in pea vines and hay since these are restricted from use as animal feed.

No residue data are available for dehydrated Southern peas. However, based on their water content of approximately 10 - 12%, we conclude that residues will not concentrate significantly upon drying. Combined residues of permethrin and its metabolites in or on dehydrated Southern peas are not likely to exceed 2.0 ppm as a result of the proposed use.

RCB contacted Dr. David B. Adams of the University of Georgia regarding use of Southern pea cannery waste as animal feed (telecon, 6/2/87). Dr. Adams stated that the cannery waste is not palatable and is not used as animal feed. RCB, therefore, will not estimate residues of permethrin likely to be found in Southern pea cannery waste.

Meat, Milk, Poultry and Eggs

The dietary intake of permethrin and its metabolites is not likely to increase for cattle as a result of the proposed use. Dehydrated peas in the cattle diet (maximum residue level = 2.0 ppm) would substitute for another commodity in the diet having the same or a higher tolerance (eg. almond hulls, 20 ppm; corn fodder, 60 ppm; grass, 15 ppm; tomato

pomace, 2 ppm). We conclude, therefore, that residues of permethrin and its metabolites are not likely to exceed the established tolerances of 3.75 ppm for milk (reflecting 0.15 ppm in whole milk), and 0.15 ppm for the meat, 2 ppm for the fat and 1 ppm for the meat by-products (3 ppm for hogs) of cattle, goats, hogs, horses and sheep as a result of the proposed use.

The diets of turkeys/broilers could consist of approximately 0.30 ppm permethrin residues based on cull potatoes (7%, 0.05 ppm tolerance), soybean meal (30%, 0.05 ppm), soybean soapstock (5%, 0.05 ppm), wet tomato pomace (3%, 2 ppm), dehydrated apple pomace (5%, 0.05 ppm) and dehydrated Southern peas (10%, 2 ppm). The diets of laying hens could consist of approximately 0.85 ppm permethrin residues based on cull potatoes (8%, 0.05 ppm), soybean seed (50%, 0.05 ppm), wet tomato pomace (2%, 2 ppm) and dehydrated Southern peas (40%, 2 ppm).

A poultry feeding study was submitted with PP#8F2099/FAP#8H5190 (Acc. No. 099976). Hens were fed 0.4, 3.4 or 33 ppm permethrin in their diets for 28 days. Initially, only residues of permethrin, per se, were determined. However, residues of the 3 metabolites (DCVA, 3-PBAcid and 3-PBAlc) were determined at a later date. Residues of permethrin, per se, are summarized in the following table.

Feeding Level -> Tissue	Residues of Permethrin, per se (ppm)		
	0.4 ppm	3.4 ppm	33 ppm
Muscle plus skin	<0.01	<0.01	0.05 - 0.08
Liver	<0.01	<0.01	<0.01
Eggs	<0.05	<0.08	<0.6

When the samples from the 33 ppm study were reanalyzed for the 3 permethrin metabolites, residues of DCVA and 3-PBAlc ranged from <0.01 - 0.03 ppm, and residues of 3-PBAcid were all non-detectable.

Based on these data, and for the purposes of this section only, we conclude that combined residues of permethrin and its metabolites are not likely to exceed the tolerances of 0.05 ppm for eggs and for the meat, fat and meat by-products of poultry.

Conclusions

- (1) The metabolism of permethrin is adequately understood. The residue of concern includes those metabolites included in the tolerance expression.

- (2) Combined residues of permethrin and its metabolites are not likely to exceed 2.0 ppm in Southern peas (pods included) and 2.0 ppm in dehydrated (dry) Southern peas as a result of the proposed use.
- (3) Combined residues of permethrin and its metabolites are not likely to exceed the established tolerances for milk, eggs and for the meat, fat and meat by-products of cattle, goats, hogs, horses, poultry and sheep as a result of the proposed use.
- (4) Adequate analytical methodology is available for enforcement (PAM II, Method I for permethrin per se in all crops; PAM II, Method III for 3-PBA in all crops; PAM II, Method IIIa for DCVA in all crops).
- (5) Analytical reference standards are available from the Pesticides and Industrial Chemicals Repository.

Recommendations

RCB has no objections to this Section 18. An agreement should be made with the FDA regarding the legal status of the treated commodities in commerce.

cc: Permethrin S.F., R.F., Section 18 S.F., Circu,
M. Metzger, PMSD/ISB
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