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

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OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

Memorandum

Subject: 88-CO-02. Proposed Section 18 for Permethrin on Small Grains (Pounce 3.2 EC, EPA Reg. No. 279-3014; Ambush Insecticide, EPA Reg. No. 10182-18). No MRID Number / No Accession Number
RCB #3541

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To: Emergency Response and Minor Use Section
Registration Division (TS-767C)

and

Toxicology Branch
Hazard Evaluation Division (TS-769C)

The Colorado Department of Agriculture requests a Section 18 specific Exemption authorizing applications of permethrin (Pounce 3.2 EC, 3.2 lbs.a.i./gallon emulsifiable concentrate; Ambush Insecticide, 2 lbs.a.i./gallon) to "small grains" to control cutworms. The commodities to which permethrin will be applied are not specified; however, we will assume that this exemption is intended to include oats, barley and wheat as in previous Section 18 requests (see E. Zager, 3/22/82; S. Malak, Ph.D., 4/15/85). If the submitter wishes to make applications to other commodities, this should be specified and further review will be required. Applications are to be made to 1.38 million acres throughout the state.

Tolerances are established for the combined residues of the insecticide permethrin [(3-phenoxyphenyl)methyl 3-(2,2-dichloroethenyl))-2,2-dimethylcyclopropane carboxylate, DCVA [3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylic acid, and 3-PBA [(3-phenoxyphenyl)methanol] in or on numerous commodities ranging from 0.05 ppm in almonds to 60 ppm in corn forage and fodder. An additional metabolite is included in the

tolerance expression for animal commodities: 3-phenoxybenzoic acid. Tolerances for animal products are listed below.

Commodity	Permethrin Tolerance (ppm)
Meat of cattle, goats, hogs, horses and sheep	0.15
Fat of "	2.0
Meat by-products of cattle, goats, horses, and sheep	1.0 (3.0 for hogs)

A Registration Standard has not been completed for permethrin.

The proposed use calls for a single, aerial application of Pounce or Ambush to small grains at 0.05 - 0.20 lbs.a.i./A. Applications would be made in a minimum of 2 gallons diluent/A, and a 30-day PHI would be imposed. Animals would not be permitted to graze treated fields prior to harvest.

Adequate plant and animal metabolism studies have been submitted. The residue of concern for plants and animals include those residues shown in the tolerance expressions.

The most recent residue data for permethrin applications to small grains (wheat) were submitted with PP#7F3514 (MRID No. 401150-01). Analytical methods were reviewed by Michael T. Flood, Ph.D. (6/4/87). Briefly, residues of permethrin, per se, are extracted with hexane/2-propanol (2/1, v/v); and clean-up by partitioning against water, and by gel permeation and florisil column chromatography is performed. Analysis is by GLC using a ^{63}Ni electron capture detector (similar to PAM II method for soybeans). DCVA is extracted from samples using methanol/water, followed by pH adjustment, hexane wash, acid hydrolysis, partitioning into methylene chloride, derivatization with pentafluorobenzyl bromide, florisil column chromatography, and GLC analysis using a mass selective detector operating in the ion monitoring mode. The method for 3-PBA is almost identical to that for DCVA. Recoveries for the 3 metabolites in wheat grain, hay and straw ranged from 59-110% at 0.05-0.50 ppm (25 ppm for permethrin) fortification levels. The limits of detection and limits of sensitivity for grain, hay and straw for all metabolites are 0.01 and 0.05 ppm respectively.

Residue data were previously reviewed (ibid.). Residues of permethrin and its metabolites were not found in any grain samples at application rates up to 10X the maximum proposed rate (50 day PHI). Residue data for hay and straw are summarized on the next page.

As described in the review by M. Flood (6/4/87), the label restriction prohibiting applications after growth stage 7 (when the second node of the stem is visible) is required to insure

that the proposed tolerances for hay and straw of 2.0 ppm will not be exceeded (corresponds to approximately 40-45 days pre-

Combined Residues of Permethrin and Its Metabolites in Wheat

Commodity	PHI (Days)	Residue Range (ppm)
Wheat hay	12	7.18, 7.20
	33	0.76, 1.03
	47	0.99, 1.10
	60	0.41, 0.43
	65	0.56, 0.83
Wheat straw	40 (2 apps.)	5.76, 7.72
	72	0.21 - 0.92
	78	ND
	91	0.28, 0.32

harvest). For the purposes of this Section 18 only, RCB will estimate 2 sets of maximum residue levels based on the proposed use for this Section 18 (30-day PHI), and based on a 45-day PHI. These maximum residue levels are listed in the Table below.

	Maximum Residue Level (ppm)	
Commodity	30-day PHI	45-day PHI
Wheat, oat or barley grain	0.05	0.05
" straw	5.0	2.0
" hay	5.0	2.0

A processing study for small grains is not available. However, since detectable residues of permethrin and its metabolites are not expected in grain as a result of the proposed use, and since applications made at 2.0 lbs.a.i./A (=10X rate, 50 day PHI), show no detectable residues in grain, for the purposes of this Section 18 only, we conclude that detectable residues of permethrin and its metabolites are not likely to be found in the processed fractions of small grains as a result of the proposed use.

Meat, Milk, Poultry and Eggs

Commodities associated with this use which are fed to swine and poultry include grain and milled products. However, since no detectable residues of permethrin and its metabolites are likely to be found in these commodities, it is unlikely that residues will be found in eggs or in the meat, fat and meat by-products of hogs and poultry as a result of the proposed use.

The maximum dietary intake of combined permethrin residues for cattle from the hay and straw of oats, wheat and rye would not increase since these commodities would substitute for other

commodities with higher tolerances which could be found in the cattle diets (e.g. range grass, 15 ppm, corn forage and fodder, 60 ppm; almond hulls, 20 ppm). Therefore, secondary residues are not likely to be found in milk or in the meat, fat and meat by-products of cattle, goats, horses and sheep as a result of the proposed use.

Conclusions

(1) The metabolism of permethrin in plants and animals is adequately understood. The residue of concern in plants includes permethrin and its metabolites DCVA and 3-PBA. An additional metabolite, 3-phenoxybenzoic acid, is included in the residue of concern for animal commodities.

(2) Analytical methods are available for enforcement (see MRID No. 401150-01).

(3) The commodities to be included in this Section 18 exemption are not specified; however, we will assume that the exemption is intended to include oats, barley and wheat. If the submitter wishes to make applications to other commodities, this should be specified and further review may be required.

(4) The proposed use for this Section 18 is different than that proposed in PP#7F3514. The use proposed for this Section 18 calls for a 30-day PHI. The use proposed in the petition calls for no applications to be made after growth stage 7 for wheat (corresponds to approximately a 45-day PHI). For the purposes of this Section 18 only, we conclude that the maximum residues for these 2 uses are not likely to exceed the values shown below.

Commodity	Maximum Likely Residue (ppm) 30-day PHI	45-day PHI
Wheat, oat or rye grain	0.05	0.05
" hay	5.0	2.0
" straw	5.0	2.0
" processed commodities	0.05	0.05

(5) For the purposes of this Section 18 only, we conclude that the established tolerances for milk, eggs, and for the meat, fat and meat by-products of cattle, goats, hogs, horses, poultry and sheep are not likely to be exceeded as a result of the proposed use.

(6) Analytical reference standards are available from the Pesticides and Industrial Chemicals Repository.

Recommendations

Assuming the commodities intended for inclusion in this Section 18 are those listed in (3) above, and TOX considerations permitting, 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, TAS (TS-769C), PMSD/ISB
RDI:E.Zager:EZ:3/29/88:RDS:3/29/88
TS-769C:RCB:M.Metzger:MM:Rm803a:CM#2:3/29/88