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

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Memorandum

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

Subject: 86-WV-02 Proposed Section 18 Exemption for Acephate
(Orthene® 75S, EPA Reg. No. 239-2418) on Apples.
No 172349
RCB #880

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To Emergency Response Section, PM-41
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and

Toxicology Branch
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The West Virginia Experimental Farm (through the West Virginia Department of Agriculture) requests a section 18 specific exemption for the use of the insecticide acephate (O,S-dimethyl acetylphosphoramidothioate) on 10,000 total acres of apples to control Rosy Apple aphid. The formulation to be used is Orthene® 75S (75% a.i.).

Tolerances are currently established for combined residues of acephate and its metabolite O,S-dimethyl phosphoramidothioate (methamidophos) ranging from 0.02 ppm (corn grain, not more than 0.01 ppm methamidophos; temporary) to 15 ppm (grass hay, mint hay); and including 0.1 ppm for the meat, fat and meat by-products of cattle, goats, hogs, horses, sheep and poultry; and 0.1 ppm in milk and eggs. Numerous tolerances are pending. A temporary tolerance of 2 ppm for combined residues of acephate and its metabolite on apples expired 3/13/86.

A Registration Standard has been completed for acephate.

The proposed use calls for applications of Orthene® 75S at a rate of 1-1 1/3 lb. (0.75-1.0 lb.a.i.)/A to a maximum of 4 lb. (3 lb.a.i.)/A/season (although the cover letter states a use rate of 1-1 1/2 lb./A, we will assume that the rate described on the supplemental label of 1-1 1/3 lb/A is correct). Applications could be made by ground equipment only in 25-400 total gallons/A as a full coverage spray. Applications could be made up to 14 days after petal fall.

The metabolism of acephate has been fully elucidated in both plants and animals. The residue of concern consists of parent acephate and its metabolite methamidophos.

The analytical methods used to determine residues of acephate and methamidophos in plant and animal tissue are similar and can be found in PAM II (Methods I and II). Briefly, macerated samples of the RAC are treated with portions of anhydrous sodium sulfate and then extracted X3 with ethyl acetate. The combined filtrates are reduced in volume and cleaned-up using different types of gel columns. Analysis is accomplished by GLC using a rubidium sulfate thermionic detector.

Residue data for apples were submitted with PP#3G2790 (Acc. No. 071242). Orchards were treated with from 1-5 applications of Orthene® 75S at a rate of 0.25-4 lb.a.i./A. Total active ingredient applied per acre per season ranged from 0.6-12 lb. (0.15-3X the total maximum application). PHI values ranged from 86-168 days. Residues ranged from not detectable to 1.5 ppm (1.75 lb.a.i./A, 86 day PHI). This and additional residue data were reviewed previously (W. Anthony, 3/31/83; 1/6/84; R. Loranger, 1/15/86). Based on this information we conclude that residues of combined acephate and its metabolite are not likely to exceed 2 ppm on apples. Additionally, based on arguments discussed by R. Loranger, 1/15/86, we conclude that residues are not likely to exceed 2 ppm in wet, dry and dehydrated pomace and in apple juice.

Meat, Milk, Poultry and Eggs

The diets of beef cattle could consist of 12.25 ppm total acephate residues based on grass (75% 15 ppm) and soybean meal (25%, 4 ppm). The diets of dairy cattle could consist of 11.7 ppm total acephate residues based on grass (70% 15 ppm), cottonseed hulls (5%, 4 ppm) and soybean meal (25%, 4 ppm). The diets of turkeys/broilers could consist of 2.4 ppm total acephate residues based on cottonseed meal (10%, 8 ppm), almond hulls (10%, 0.3 ppm), soybean meal (30%, 4 ppm) and alfalfa pomace (5%, 2 ppm).

Addition of apple pomace treated with acephate to the diets of cattle would not increase the total possible maximum intake of acephate residues from their diets because apple pomace would substitute for a commodity containing higher acephate residues. Therefore, residues in milk and in the meat, fat and meat by-products of cattle, goats, hogs, horses and sheep are not likely to increase as a result of the proposed use, and are therefore not likely to exceed the current tolerance of 0.1 ppm.

A poultry feeding study was submitted with PP#3F1375 and reviewed by W.S. Cox, 10/31/73. Acephate was administered to poultry at levels of 3, 10 and 30 ppm for 92 days. Maximum residues found in poultry tissues and eggs are summarized below.

Commodity	Maximum Residues Found at Each Feeding Level (ppm)		
	3 ppm	10 ppm	30 ppm
Eggs	ND	0.1	0.206
Poultry fat	ND	ND	ND
" kidney	ND	ND	ND
" liver	ND	ND	ND
" muscle	ND	0.018	0.166

Based on this data and on the maximum dietary intake of acephate residues for poultry of 2.4 ppm, we conclude that combined residues of acephate and methamidophos are not likely to exceed the current tolerance of 0.1 ppm for eggs and for the meat, fat and meat by-products of poultry.

Conclusions

- (1) The metabolism of acephate in plants and animals is adequately understood. The residue of concern includes acephate per se and a single metabolite methamidophos.
- (2) Total combined residues of acephate and methamidophos are not likely to exceed 2 ppm in or on apples, apple juice, and wet, dry and dehydrated apple pomace. Residues are not likely to exceed the current tolerances of 0.1 ppm for milk, eggs, and for the meat, fat, and meat by-products of cattle, goats, hogs, horses, sheep and poultry.
- (3) Analytical methods are available for enforcement (PAM II, Methods I and II).
- (4) Analytical reference standards are available from the Pesticides and Industrial Chemicals Repository.

Recommendations

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: Acephate (Orthene) S.F., R.F. Section 18 S.F., Circu, M.Metzger, PMSD/ISB

RDI:E.Zager:EZ:5/6/86:RDS:5/6/86

TS-769:RCB:M.Metzger:MM:Rm814:CM#2:5/6/86