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

APR 24 1987

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: PP#4F3013/FAP#4H5421: Thiodicarb in tomatoes. Evaluation of a Tomato Processing Study Submitted by Amendment of December 18, 1986. MRID #400491-01; RCB #1885

FROM: V. Frank Boyd, PhD., Chemist
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THRU: Charles L. Trichilo, Ph.D., Chief
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TO: Dennis Edwards (PM#12)
Insecticide-Rodenticide Branch
Registration Division (TS-767)

and

Toxicology Branch
Hazard Evaluation Division (TS-769)

Union Carbide Corporation, Agricultural Products Company, Inc. proposed tolerances for combined residues of the insecticide thiodicarb and its metabolites in/on tomatoes at 3.0 ppm. A food additive tolerance of 5.0 ppm on tomato paste was proposed under FAP#4H5421.

The Memo of July 26, 1984, F. Boyd, evaluation PP#4F3013/4H5421, delineated a deficiency regarding the tomato processing study:

Deficiency 3(b):

The adequacy of the food additive tolerance of 5.0 ppm, for tomatoe paste, as proposed, cannot be substantiated by the processing study because of the low residue level (0.13 ppm) in the tomatoes used for processing. A study using tomatoes containing residues at or near the proposed 3.0 ppm level is required. Analysis should be conducted for paste, puree, catsup and dried pomace.

Petitioner's Reply to Deficiency (3b):

A project report on a study completed on December 17, 1986, Project No. 804R11, entitled, "Thiodicarb Insecticide Tomato Processing Study", is presented as the sole submission under the current amendment letter of 12/18/86. The report presents a single analytical value (no raw data or indication that more than a single sample was analyzed) for each processed tomato product (see Table I).

Table I. Thiodicarb Residues in/on Processed Tomato Products and Whole Tomatoes used for Processing. 1/

Sample	Thiodicarb (ppm)	Concentration Factor 2/
Whole tomato	5.6	--
Whole tomato, washed	0.62	--
Wet pomace	1.5	2.42
Dry pomace	3.9	6.29
Juice	0.26	0.42
Puree	<0.04	<0.06
Paste	0.07	0.11

1/ Untreated control samples were all reported as N.D., not detected (<0.04 ppm).

2/ Concentration factor is based on whole tomato, washed, residue of 0.62 ppm, which was the processed residue.

Fresh ripe tomatoes (180 lbs) were purchased from a produce outlet. A 90 lb. quantity was used as untreated control and a 90 lb. quantity was sprayed with an aqueous suspension of Larvin® 3.2, at an undisclosed rate of application. The treated tomatoes remained untouched for 24 hours, to simulate a 1-day PHI. The 24 hour aged tomatoes (RAC) were then washed by soaking in lukewarm tap water, then spread out to dry. The dry tomatoes were placed in polyethylene buckets and stored at - 20°C until processing.

Analyses of untreated controls, treated product and spiked controls were performed by the FPD-General Method for thiodicarb, and recoveries of 70 to 88% were reported. The values presented in Table I are corrected for recovery.

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RCB's Comments on Petitioner's Response

The petitioner has sprayed fresh tomatoes with thiodicarb; let the residue set for 1 day; measured it at a level of 5.6 ppm; washed the tomatoes until a level of 0.62 ppm is attained; and then carried the washed tomatoes through steps leading to wet and dry pomace, juice, puree and paste.

Perhaps the petitioner was thinking that since thiodicarb did not translocate substantially to carrot roots after a foliar application, thiodicarb residues would stay mostly on the surface of tomatoes and thus most of it will be washed off during a complete fractionation study. However the petitioner must recall that some of his previous reports indicate that rapid cleavage of the N-S-N linkage results in two molecules of methomyl from one molecule of thiodicarb. Thiodicarb and methomyl comprise the majority (96-98%) of the free residue components in plants. Methomyl is significantly absorbed and translocated by plants (see p. 8190 of the Pesticide Manual, 7th Edition, 1983, Published by the British Crop Protection Council). The proposed use indicates that applications are to be repeated as needed. Accordingly, we would expect much of the weathered thiodicarb residues to be inside of the tomato fruit.

Conclusions:

The tomato processing data presented with this amendment are in contradiction to the previously presented processing data (PP#4F3013/4H5421, F. Boyd Memo of 7/26/84). When a limited residue of 0.13 ppm existed in whole tomatoes, a concentration of 1.6X occurred in tomato paste, upon processing. In the study presented with the current amendment, there is no concentration in any fraction if we were to consider the 5.6 ppm level found on unwashed tomatoes.

It would appear that the method and timing of application was responsible for the difference in processed commodity concentration. The current study reports residues predominantly on the fruit surface. The previous study reported residue accumulated from sequential field applications which may be predominantly in the pulp or distributed more evenly throughout the tomato. These data indicate that a third processing study would be necessary to accomplish the following:

(a) Tomatoes for processing need to contain weathered residues of approximately 3 ppm (proposed rac tolerance) or higher.

(b) The residue should be distributed in the fruit as representative of the proposed use of Larvin 3.2 in the field.

Recommendations

RCB continues to recommend against establishing the proposed 3 ppm thiodicarb tolerance on tomatoes. Deficiencies in Conclusions Nos. 1b, 2c, 3b, 4a, and 4c outlined in RCB's 7/26/84 review are still outstanding.

TS-769:RCB:F.Boyd:vg:CM#2:Rm804:X77484:4/17/87
cc: R.F., Circu, F. Boyd, EAB, EEB, PMSD/ISB, FDA, PP#4F3013
RDI: J.Onley, 4/15/87; R.Schmitt, 4/15/87