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

8-16-84

AUG 16 1984

MEMORANDUM

OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

SUBJECT: EPA Reg. No. 464-448. Amended registration of chlorpyrifos (Lorsban 4E) on citrus. Accession No. 253677.

FROM: Sami Malak, Chemist *Sami Malak*  
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THRU: Charles L. Trichilo, Ph.D., Chief  
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TO: Jay Ellenberger, PM# 12  
Insecticide-Rodenticide Branch  
Registration Division (TS-767)

Dow Chemical Company responds to the deficiencies listed in our review of the amended registration request for the use of chlorpyrifos Lorsban 4E (EPA Reg. #464-448), with petroleum oil sprays on citrus.

A tolerance for residues of chlorpyrifos and its metabolite 3,5,6-trichloro-2-pyridinol (TCP) has been established in or on citrus at 1 ppm (40 CFR 180.342).

Deficiencies listed in our memo of 4/13/84 include:

1. The amount of oil to be added should be specified.
2. Additional residue data are needed from side-by-side tests with and without oil added to spray solutions.

Registrant's response to Deficiency #1:

The proposed use is identical to the registered use except that petroleum oil may be added when chlorpyrifos is used on citrus. The present use allows for 0.5 lb ai/100 gallons of spray with a maximum of 3.5 lbs ai/A except in California where up to 6 lbs ai/A may be applied. There is a limit of 2 applications/year and a maximum of 7.5 lbs ai/year. If 3.5 lbs or less per year is applied, there is a 21 day PHI. For more than 3.5 lbs per year a 35 day PHI must be observed. To improve insect control on citrus, the proposed label recommends adding petroleum oil to the spray mixture at a rate of up to 1.8 gallons per 100 gallons of water for dilute spray and 20 gallons per 100 gallons of water for concentrate sprays.

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Our Comment:

we consider deficiency #1 resolved.

Registrant's Response to Deficiency #2:

In response to deficiency #2, additional residue data have been submitted with this application. Data reflect 4 side-by-side field trials from 2 different locations in California in which mature orange trees received up to 4 applications of Lorsban 4E. Application rates and spray volume are as follows: dilute sprays at 6 lbs ai/A in 1500 gallons of water with or without oil (20-27 gallons of oil); and concentrate sprays at 3.5 lbs ai/A in 100 gallons of water with or without oil (20 gallons of oil).

Residues were measured using Dow Chemical Company's method 84.4 which is discussed in connection with PP#4F3062 (memo of L. Kutney, 4/24/84). The method entitled "Determination of chlorpyrifos and 3,5,6-trichloro-2-pyridinol in Stone Fruit by Gas Chromatography" is similar to the PAM II Method II. Sensitivity levels were reported to be 0.01 ppm for chlorpyrifos and 0.05 ppm for TCP.

Recovery data were also included in which whole oranges were fortified with either chlorpyrifos or its metabolite 3,5,6-trichloro-2-pyridinol at levels of 0.01-2.0 ppm. Recoveries from whole oranges were reported at 71-103% for chlorpyrifos and from 85-100% for its metabolite (TCP).

Residues of chlorpyrifos per se in or on whole oranges ranged from 0.05-0.47 ppm with oil and from 0.24-0.43 without oil from dilute sprays. Those of its metabolite 3,5,6-trichloro-2-pyridinol ranged from non-detectable (<0.05 ppm) to 0.09 ppm with oil and from non-detectable (<0.05 ppm) to 0.11 ppm without oil. Data reflect 35-36 day PHI's.

Residues of chlorpyrifos per se from concentrate spray applications ranged, respectively, from 0.17-2.3 ppm and 0.17-1.5 ppm in or on whole oranges from applications with and without oil. Those of its metabolite 3,5,6-trichloro-2-pyridinol ranged from non-detectable (<0.05)-0.4 ppm and non-detectable (<0.05)-0.36 ppm, respectively. All concentrate spray data reflect a 21 day PHI.

The following is a summary of residue data:

Maximum Chlorpyrifos Residues in or on Oranges

PPM of	Dilute Sprays 6 lbs ai/1500gal		Concentrate Sprays 3.5 lbs ai/100 gal	
	oil	no oil	oil	no oil
Chlorpyrifos	0.47	0.43	2.3	1.5
Metabolite*	0.09	0.11	0.4	0.36

\*3,5,6-trichloro-2-pyridinol

The above data indicate that residues of chlorpyrifos and its metabolite 3,5,6-trichloro-2-pyridinol in or on citrus are not likely to exceed the established 1 ppm tolerance as a result of dilute spray applications at the registered rate with or without oil added to the spray. However, residues of chlorpyrifos and its metabolite 3,5,6-trichloro-2-pyridinol in or on citrus may exceed the established 1 ppm tolerance regardless of whether or not oil is added to the concentrate spray solution.

Conclsions

1. Residues of chlorpyrifos and its metabolite 3,5,6-trichloro-2-pyridinol in or on citrus are not likely to exceed the established 1 ppm tolerance as a result of dilute spray applications at the registered rate with or without oil added to the spray.
2. Residues of chlorpyrifos and its metabolite 3,5,6-trichloro-2-pyridinol in or on citrus may exceed the established tolerance of 1 ppm as a result of concentrte spray applications at the registered rate with or without oil added to the spray.

Recommendation

We recommend against this amended use registration for the reason listed in Conclusion 2.

In addition, the submitted data indicate that the established tolerance on citrus may be exceeded as a result of the registered uses of chlorpyrifos in concentrate sprays. Consequently, the registrant should propose a citrus tolerance high enough to cover residues from the already registered uses, unless the reported high values can be attributed to some unique and unlikely to recur causes. Seasonal variations due to climatological conditions are not an adeuqate explanation.

cc:R.F., Circu., Reviewer,Chlorpyrifos S.F., Amended Use File.

RDI:EZ:8/13/84:RDS:8/13/84

TS-769:RCR:S.Malak:gmk:CM#2:RM810:X77377:8/14/84