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

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OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

SUBJECT: 464-EUP-AI. Chlorpyrifos on lemons and oranges.

FROM: Lynn M. Bradley, Chemist
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TO: Jay Ellenberger, Product Manager #12
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THRU: Charles L. Trichilo, Chief
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The Dow Chemical Company requests an experimental use permit for Lorsban 15G [EPA Reg. No. 464-523, a granular formulation containing 15% active chlorpyrifos, or 0,0-diethyl-0-(3,5,6-trichloro-2-pyridinyl) phosphorothioate] on lemons and oranges. Temporary tolerances are for residues of chlorpyrifos and its metabolite 3,5,6-trichloro-2-pyridinol in or on oranges and lemons at 2.5 ppm and dried citrus pulp at 15 ppm were established in connection with PP#9G2168. These tolerances were due to expire 4/10/81, and RCB recently recommended for their extension, including expansion of the EUP to include Texas as well as the original program in California (memo of L. Bradley, 4/3/81, PP#9G2168).

The formulation used in the existing EUP (464-EUP-56) is Lorsban 4E (4 lb active chlorpyrifos/gal emulsifiable concentrate); the use pattern is for 0.13-0.5 lb active/100 gal with up to 3000 gal/A for dilute spray (to run off) or up to 15 lb ai./A in 100 gal/A for concentrate sprays (max. 30 lb active/A). A petroleum spray oil may be added to the spray mixture for summer foliage and no more than two applications per fruit year are permitted with a PHI of 14 days if one application is made or 28 days if two applications are made. Livestock are not allowed to graze in treated areas.

The currently proposed program for Lorsban 15G is to treat up to 200 acres in Florida only with 2010 lb active chlorpyrifos. The proposed use is to treat the orchard floor with one ground application of 10.05 lb active/A in the spring or two applications of 4.95 lb active/A, one in spring and again in the fall, to control weevils. Do not apply more than 10.05 lb active/A per season and do not allow livestock to graze in treated areas. No PHI is imposed.

The nature of chlorpyrifos residues in plants (beans, corn) and animals (rats, cows, pigs, chicken) has been discussed in PP#4F1445 and PP#3F1306.

Plant metabolism studies with radiolabelled chlorpyrifos and its metabolite, 3,5,6-trichloropyridinol, show that chlorpyrifos residues on the surface of plants are absorbed and translocated. Chlorpyrifos is degraded in

soil and in or on plants yielding 3,5,6-trichloropyridinol (TCP), TCP may then become conjugated with plant substrates. In PP#F1306 (F.D.R. Gee, 3/1/73), studies showed may limited uptake and translocation into corn forage of residues from treated soil.

Animal metabolism studies show that degradation occurs via oxidation and hydrolysis to water-soluble phosphoric acid derivatives; these derivatives are excreted primarily in the urine. The hydrolysis product, TCP, is excreted, or is further degraded into smaller fragments. The significant residues of animal metabolism are the parent compound, chlorpyrifos, and its metabolite, 3,5,6-trichloro-2-pyridinol.

In petition 0F2270, a question was raised concerning the significance of the unidentified material found in the bean metabolism study, and also questions concerning the animal metabolism. A large animal metabolism study was requested, and it was noted that if any additional plant metabolites are judged to be significant and in need of regulation, animal metabolism studies for those compounds may be required for any permanent tolerances. (See the review of E. M. K. Leovey, 4/29/80). We are not requiring this data now, but it will be required for any permanent tolerance on citrus. The petitioner should be so advised.

No analytical methodology is submitted; neither is there any residue data for the proposed use of the 15G formulation. The petitioner points out that the maximum treatment rate is ca. one-third that currently permitted (10.05 lb active for the orchard floor application of the 15G formulation vs. 30 lb active for the foliar application of the 4E formulation per season).

Residue data from CA which were reviewed in PP#9G2168 (A. Rathman, 9/24/79) indicate that maximum residue levels in oranges from up to 1.5x treatment rate were 2.0 ppm from one application at 14 days PHI, and a residue decline analysis indicated that residue levels at 28 days PHI from 2 applications (30-60 days apart) would be <2 ppm.

Although the proposed 15G use is an orchard floor treatment rather than a foliar use, since the maximum treatment rate is less than that now permitted, we expect that residue levels from the proposed use will not exceed the existing tolerance of 2.5 ppm in oranges and lemons.

The fact that little translocation into foliage occurs from treated soil further supports this conclusion and eliminates any concern that a PHI might need to be imposed.

Since residue levels in the r.a.c.'s will not exceed 2.5 ppm, the 15 ppm food additive tolerance for dried citrus pulp and the established meat and milk tolerances are also considered to be adequate.

The petitioner should be advised that for any expansion of this EUP, and certainly for any permanent tolerance covering application of the 15G formulation, actual residue data from ground application of the granular formulation will be required.

Conclusions and Recommendations

Residues from the proposed use are not expected to exceed the established temporary tolerances for chlorpyrifos and its metabolite in oranges and lemons.

Therefore, we recommend in favor of this EUP.

The petitioner should be advised of the following requirements:

1. For any permanent tolerances for chlorpyrifos on citrus, the metabolism questions raised in PP#0F2270 will need to be resolved.

2. For any expansion of this EUP, residue data reflecting orchard floor treatments at the maximum proposed rate use will be required.

3. For any permanent tolerance on citrus, residue data reflecting all proposed treatment types (i.e., foliar plus orchard floor) at maximum application rates and minimum PHI will be required.

cc: Reading file
Reviewer
Circu
Section 24(c) SF
Subject file
Amended Use File
PP#9G2168
TS-769:Reviewer:L.M.Bradley:LDT:X77324:CM#2:RM:810:Date:5/19/81
RDI:Section Head:6/10/81:RDS:Date:6/10/81