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

MAR 24 1986

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

Memorandum

Subject: Chlorpyrifos (Lorsban® 50W; EPA Reg. No. 464-552). Amended Registration for Use on Cherries. Acc. No. 261335 RCB #578

From: Michael S. Metzger, Chemist
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

Thru: Edward Zager, Section Head, SRS 2
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

To: Jay S. Ellenberger, PM-2
Registration Division (TS-767)

Dow Chemical Company U.S.A. proposes amended registration for the use of Lorsban® 50W on cherries to control various insects. Lorsban® 50W is a wettable powder containing 50% active ingredient (chlorpyrifos) and 50% inert ingredients.

Tolerances for residues of chlorpyrifos [O,O-diethyl-O-(3,5,6-trichloro-2-pyridyl)phosphorothioate] and its metabolite pyridinol (3,5,6-trichloro-2-pyridinol) have been established on a wide variety of raw agricultural commodities and range from 0.05 ppm (lima and snap beans) to 15 ppm (soybean straw). Tolerances have been established for a variety of animal commodities (2.0 ppm for the fat, meat and meat by-products of cattle). A tolerance with regional registration has been established at 2 ppm for the use of Lorsban® 4E on cherries in MI, OH, WI, PA and NY (PP#0E2529; Acc. No. 270135).

Lorsban® 50W is not currently registered for use on cherries (Lorsban® 4E is as described above). Lorsban® 50W is currently registered for use on apples (1.5 lb.a.i./A; 8 applications max./season with last two separated by 21 days or greater; 28 day PHI; livestock are not to be grazed on treated orchards); almonds, walnuts and filberts (2 lb.a.i./A; 3 applications/season max. (2 for walnuts); 14 day PHI; livestock are not to be grazed on treated orchards); and pecans (1 lb.a.i./100 gallons; 5 applications/season max.; 28 day PHI; livestock are not to be grazed on treated orchards).

1/4
~~360~~

Lorsban® 4E is the formulation which currently has regional registration for use on cherries in OH, WI, MI, PA and NY. 1.5-3 quarts (1.5-3 lb.a.i.) per 100 gallons of water is applied (3X max.) to the trunks and lower limbs of cherry trees as a coarse, low pressure spray. The second application can be made two weeks after the first but not less than 6 days before harvest. The final application is made after harvest. Meat and dairy animals may not graze in treated orchards.

The proposed new use for Lorsban® 50W is for foliar application to sour cherries. Up to 8 applications per season could be made as a cover spray of 3 lb. (1.5 lb.a.i.)/A. The required dosage should be mixed in sufficient water to ensure thorough and complete coverage of the foliage and crop, and should be applied as a concentrate or dilute spray (25-400 gallons/A) using conventional, power operated ground spray equipment. A PHI of 14 days would be imposed, and livestock would not be allowed to graze on treated orchards. In California, work involving contact with trees would not be allowed within 2 days after treatment. The pesticide is restricted from use on sweet cherries as premature leaf drop may occur.

The residues of concern for chlorpyrifos treatment of sour cherries include the parent compound, chlorpyrifos, and a single metabolite, pyridinol (3,5,6-trichloro-2-pyridinol). The two compounds are determined separately using Method ACR 84.4 (2) (PP#4F3062; Acc. no. 072408).

Chlorpyrifos is extracted from cherries by shaking the sample with acetone, centrifugation, and volume reduction of an aliqot with a Snyder column. The reduced volume is diluted with water and cleaned up on a pre-washed Sep-Pak C_{18} cartridge. The chlorpyrifos is eluted from the cartridge with methanol, diluted with water and extracted into hexane. Analysis is accomplished by GLC with a flame photometric detector. The detection limit is 0.01 ppm. Recovery values were 90 and 89% for fortification at 0.01 and 0.10 ppm. Storage fortification data were submitted with PP#1E2529 (Acc. No. 070135). 10 grams of cherries were spiked with 0.01-0.50 ppm chlorpyrifos and stored at -20°C for 8 months. Recoveries ranged from 72-94% (average= 85%).

Total residues are also determined by method ACR 84.4 (2), and pyridinol residues are determined by difference, chlorpyrifos being measured in the method above. A sample of cherries is heated in 10% NaOH in methanol, cooled, shaken and filtered. The filtrate is diluted to volume with methanol and evaporated to near dryness. Following addition of dilute acid, the solution is cleaned up on a Sep-Pak C_{18} column, and the residue is eluted with methanol. The eluate is diluted with sodium bicarbonate and shaken with benzene. The benzene is discarded, the aqueous layer is acidified, and a second aliqot of benzene is shaken with the aqueous layer.

Following centrifugation, an aliqot of benzene is removed and treated with BSA [N,O-bis(trimethylsilyl)acetamide] to derivatize the residue. Analysis is accomplished by GLC using an electron capture detector. Recoveries using this method ranged from 75-120% at fortifications of 0.05-10 ppm. The reported sensitivity is 0.05 ppm. Storage fortification data were submitted with PP#1E2529 (Acc. No. 070135). 10 grams of cherries were spiked with 0.05-1.0 ppm pyridinol. Recoveries ranged from 77-120% (average= 95%).

Sample gas chromatograms submitted with PP#1E2529 (Acc. No. 070135) showed adequate peak resolution, minimal response in untreated controls, and confirmation of the stated detection limits for both methods.

No new residue data were submitted with this amended registration. Residue data were submitted with PP#4F3062 (Acc. No. 072408) for foliar applications of Lorsban® 50W to sweet cherries in CA, ID and WA; and to sour cherries in ID, PA and MI. Residues were measured for applications made using both high (100-500 gal/A) and low volume (40-71 gal/A) sprays. Residue data submitted with PP#1E2529 (Acc. No. 070135) utilized Lorsban® 4E with applications made to the trunk and lower limbs as a coarse, low pressure spray. Since both the formulation and the method of application are different, this residue data is not applicable to the current amended registration.

The most important commercial sour cherry orchards are located in NY, MI, OH, CO, UT, WI and PA ("Growing Cherries East of the Rockies", USDA, 1977). Based on a memo describing IR-4 crop groupings (R.B. Perfetti, 12/8/83), an adequate geographical representation for cherries could include ID, MI, PA, WA and CA. Since data for sour cherries is available from the first three, and data for sweet cherries is available from CA and WA, and since residues for sweet cherries tend to be higher than those for sour cherries for samples taken from the same locations, we consider this geographical representation of residue data adequate for the purposes of this amended registration.

Lorsban® 50W was applied as a full coverage foliar spray at a rate of 1.5 lb.ai./A (max. proposed rate) for 5-8 applications at intervals of approximately 7-14 days. PHI's ranged from 14 to 31 days. Fruit was randomly picked from 2-5 trees to obtain composite samples. Chlorpyrifos residues per se in or on sweet cherries ranged from 0.1-0.66 ppm (14 day PHI) and 0.03-0.15 ppm (28 day PHI). Total residues on sweet cherries ranged from 0.15-1.65 ppm (14 day PHI) and 0.33-0.76 ppm (28 day PHI). Chlorpyrifos residues per se on sour cherries ranged from 0.07-0.16 ppm (14 day PHI) and 0.02-0.10 ppm (28-31 day PHI). Total residues in or on sour cherries ranged from 0.25-0.38 ppm (14 day PHI)

and 0.19-0.41 ppm (28-31 day PHI). All residues measured are below the current tolerance 2 ppm. We conclude that it is unlikely that residues of chlorpyrifos in or on sour cherries will exceed 2 ppm.

Conclusions and Recommendations

RCB concludes that it is unlikely that residues of chlorpyrifos in or on sour cherries will exceed the current established tolerance with regional registration of 2 ppm when Lorsban® 50W is applied as proposed. The residue data currently available represents an adequate geographical representation of sour cherry growing locations within the U.S.

RCB recommends for this amended registration.

cc:R.F.,Circu,M.Metzger,Chlorpyrifos (Lorsban) S.F.,Amended use file, PMSD/ISB
RDI:E.Zager:EZ:3/14/86:RDS:3/14/86
TS-769:RCB:M.Metzger:MM:Rm810:3/14/86