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

FEB 16 1994

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

MEMORANDUM:

SUBJECT: PP#1F2575 - Chlorpyrifos on Citrus - Evaluation of Amendments Including Residue Data to Use Lorsban 50W Wettable Powder and Wettable Powder Packets Insecticides. CBTS Nos. 12054 and 12055. DP Barcodes D192286 and D192287. MRID No. 426710-01.

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THRU: Debra F. Edwards, Ph.D., Chief *Robert Squatka for*
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Background

Per a 2/16/93 letter Dow Elanco is requesting approval of an amendment including supplemental labeling for application of Lorsban 50W Wettable Powder Insecticide (EPA Reg. No. 62719-39) and Lorsban 50W Insecticide In Water Soluble Packets (EPA Reg. No. 62719-221) (both 50% a.i. by weight) to citrus. The current submission includes residue data using the 50W wettable powder formulation on the citrus trees and the liquid formulation on the orchard floor. A similar use pattern for liquid Lorsban 4E has been previously approved for use on citrus under the subject petition.

The registrant indicates that data gaps shown in the previously issued Chlorpyrifos Reregistration Notices were addressed in letters to the Agency dated 1/3/85 and 12/20/91 in which they either provided additional data or agreed to conduct additional studies.



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Tolerances reflecting residues of chlorpyrifos (i.e. parent and TCP metabolite) are listed under CFR 180.342 and 185.1000 and include citrus fruits at 1.0 ppm, citrus pulp at 5.0 ppm and citrus oil at 25.0 ppm. In an addendum to the Chlorpyrifos Registration Standard Residue Chemistry Chapter (D. Edwards, HED, to C. Kent, RD, 1/13/89) it was stated that **TCP could be excluded from the tolerance expression**. This position was reaffirmed by TOX in a memo from E. Doyle to R. Schmitt and E. Zager (4/1/91), which stated that "TOX Branch has no toxicological concerns regarding exclusion of TCP from the tolerance statements for chlorpyrifos. Chlorpyrifos is regulated on the basis of cholinesterase inhibition. TCP is inactive with respect to anticholinesterase activity." Therefore, the only residue of concern in plants is the parent compound, chlorpyrifos.

A review of the subject petition (see 3/4/82 and 5/7/82 memos of K. Arne and 5/11/84 memo of L. Bradley) included foliar use of Lorsban 4E (EPA Reg. No. 464-448) 40.7% chlorpyrifos (4 lbs/gal) at a diluted concentration with up to two spray applications of 3.5 lb a.i./A (6 lb a.i./A in CA) applied at 0.5 lb a.i./100 gal. A maximum of 7.5 lb a.i./A/year (i.e. 15 pints/A/year) may be applied, with a PHI of 21 days for applications of ≤ 3.5 lb a.i./A and a PHI of 35 days for applications ≥ 3.5 lb a.i./A with a restriction against livestock grazing in treated areas.

From the original citrus residue review (i.e. K. Arne 3/4/82) the following was concluded:

The submitted data clearly show that the potential of high residues is greater when a low volume application is made.

The citrus data indicated that low volume ground application resulted in residues above the proposed tolerance (i.e. 3.0 ppm at 1.7X and a 14 day PHI) while residues from high volume spray resulted in an average and maximum residue of 0.45 and 0.73 ppm, respectively at 2X and a 21 day PHI. We note that the approved label for Lorsban 4E provides for a minimum spray volume of 100 gal/A for ground application to citrus, while the proposed labels for the new formulations include use at 50 GPA.

Discussion

Currently, Chlorpyrifos Reregistration files have been forwarded to Dynamac for review. The subject amendment for the approval of the wettable powder formulation on citrus is predicated on the basis that residues will not exceed the approved tolerance on citrus. Accordingly, specific issues relating to the chlorpyrifos reregistration are not considered of decisive importance to the subject amendment.

Residue Data in Current Submission (MRID No. 426710-01)

The present label for Lorsban 4E (4 lbs a.i./Gal) allows no more than 10 quarts per acre per season on citrus orchard floors (i.e. 10 lbs a.i./A) and no more than two applications, or more than 15 pints/A per fruit year (i.e. 7.5 lbs a.i./A) on the citrus fruit with a 30 day interval between applications and a 35 day PHI or if the total application rate does not exceed 7 pints per acre a PHI of 21 days.

Specifically, the use restrictions on the proposed labels include:

Do not apply more than 2 applications or more than 15 pounds of Lorsban 50W per acre per year (i.e. 7.5 lbs a.i./A).

Do not make a second foliar application within 30 days after the first application.

Do not treat within 21 days of harvest for applications up to 7 pounds of Lorsban 50W per acre or within 35 days of application of rates above 7 pounds per acre.

Do not allow livestock to graze in treated areas.

Do not do any work involving contact with treated trees within 2 days after treatment.

Lorsban 4E and Lorsban 50W Insecticides were used on oranges and grapefruit in six locations in, California, Florida and Texas. A single application of Lorsban 50W at a rate of 12 lbs/A (i.e. 6 lbs a.i./A) was applied to the foliage as a dilute spray, at the rate of 90-190 gallons/A, using airblast spray equipment 35 days before harvest. Two applications of Lorsban 4E at the rate of 5 quarts/A (5 lb a.i./A) were applied to the orchard floor as a dilute spray broadcast treatment at the rate of 21-28 gallons/A, using a hydraulic boom sprayer, 87 to 88 and 28 days before harvest.

Samples of oranges and grapefruit were collected 28 days after the last application of Lorsban 4E. The grapefruit and orange samples contained 12 and 30 mature fruit, respectively, except for the orange samples from Texas which contained 20 mature fruit. The samples were pulled randomly from all quadrants of the tree placed directly into bags and frozen immediately. Samples were maintained frozen during shipment to Dow in Midland, Michigan and until analysis. The citrus samples were held in frozen storage at -20°C from the time of harvest until analysis, a period of time of up to 13 months. Residues of chlorpyrifos have been shown to be stable over four years in frozen storage.

Residues of chlorpyrifos per se were determined by the GC method ACR 84.4 with some minor modifications. Method recoveries from control samples fortified over the range of 0.01 to 1.0 ppm averaged 77% for the grapefruit and 81% for the oranges. Sample chromatograms and calculations were provided.

Chlorpyrifos Residues in Citrus After Foliar and Orchard Floor Treatment

Location	Sample No./Crop	Gross Residue PPM	Corrected Residue PPM
Lindsay, CA	3 controls/Grape fruit	0.000 to 0.104	-
"	283797/"	0.086	0.11
"	283798/"	0.069	0.09
"	283799/"	0.187, 0.180	0.24
Donna, TX	3 controls/Grape fruit	0.000 to 0.001	-
"	283677/"	0.012	0.02
"	283678/"	0.010	0.01
"	283679/"	0.033, 0.035	0.04
"	5 controls/Oranges	0.000 to 0.016	-
"	283671/"	0.008	0.01
"	283672/"	0.013	0.02
"	283673/"	0.014, 0.013	0.02
Merritt Island, FL	3 Controls/Grape fruit	all 0.000	-
"	284272/"	0.269, 0.381	0.42
"	284273/"	0.224, 0.377, 0.430, 0.448	0.48
"	284274/"	0.433, 0.650, 0.392	0.64
Porterville, CA	3 Controls/Oranges	all at 0.000	-
"	283803/"	0.426, 0.525, 0.284	0.51
"	283804/"	0.248, 0.328	0.36

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"	283805/"	0.278, 0.413, 0.239, 0.449	0.43
Loxahatchee, F1	3 Controls/Oranges	all at 0.000	-
"	285540/"	0.144	0.18
"	285541/"	0.171, 0.219	0.24
"	285542/"	0.119	0.15

* All field trials consisted of two applications of Lorsban 4E each at 5 quarts/A (i.e. 5 lbs a.i./A) on the citrus orchard floor with the first application at a 87 to 88 day PHI and the second at a 28 day PHI at 20 to 30 GPA; and one foliar application (i.e. air blast sprayer) of the 50W Wetttable Powder at 12 lbs/A (i.e. 6 lbs a.i./A) at 90 to 190 GPA and a 35 day PHI.

* Gross residues were corrected based on an average method recovery of either 77% for grapefruit or 81% for oranges.

Conclusions

1. The chlorpyrifos residue data on citrus obtained from six field trials utilizing the wetttable powder formulation (i.e. Lorsban 50W) for the foliar application and Lorsban 4E for the orchard floor applications indicates that the use of the proposed new formulations (i.e. Lorsban 50W Wetttable Powder and Lorsban Water Soluble Packets) at the proposed application rate and label restrictions resulted in a maximum residue in/on citrus of 0.64 ppm and accordingly residues of chlorpyrifos per se in/on citrus above the established 1.0 ppm tolerance should not occur. (NOTE: Conversion of the existing tolerances from chlorpyrifos plus TCP to chlorpyrifos per se should be carried out through the reregistration process.)

2. The proposed labels for the new Lorsban 50W Wetttable Powder and Lorsban Water Soluble Packets formulation do not exceed the previously approved application rate for the liquid formulation and contain the appropriate use restrictions. However, the proposed labels provide for a 50 GPA spray volume for use in California and Arizona on thrips and mealybugs which is less than the previously approved 100 GPA minimum spray volume. In the absence of additional residue field trial supporting the proposed lower spray volume, the current labels are unacceptable since the previously submitted data indicated that lower spray volumes are likely to result in overtolerance residues.

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Recommendation

At this time CBTS recommends against approval of the proposed labels for Lorsban 50W Wettable Powder and Lorsban Water Soluble Packets since the labels include a recommended spray volume of 50 GPA which is below the previously approved 100 GPA for Lorsban 4E.

However, if the proposed labels are revised so that the minimum recommended spray volume for all the proposed uses is 100 GPA, CBTS would not object to the approval of the Lorsban 50W Wettable Powder and Lorsban Water Soluble Packets labels for chlorpyrifos use on citrus.

cc: Reviewer-Otakie, PP#2F4104, RF, Circu, E. Haeberer, P
Deschamp, Chlorpyrifos List A File, Chlorpyrifos Subject File.

RDI: EHaeberer:2/15/93 RLoranger:2/15/93