PMSD/ISB

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

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OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: ID #CA-880026
[RCB#: 4590]
[Acc#: None]

Chlorpyrifos[LORSBAN®-4E]: 24(c) on asparagus in the State of California.

FROM: William L. Anthony
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William L. Anthony

THRU: Ed Zager, Section Head
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TO: D.Edwards, PM #15
Insecticide-Rodenticide Section II
Registration Division (TS-767C)

Victoria Island Farms, located in California, requests a Special Local Needs (SLN) 24(c) registration for LORSBAN®-4E [EPA Reg. #464-448], an insecticide, for control of the asparagus aphid in the State of California.¶

LORSBAN®-4E contains 40.7% (4 lb a.i./gal) of the active ingredient chlorpyrifos [0,0-diethyl-O-3,5,6-trichloro-2-pyridyl phosphorothioate]. It is currently registered for use on numerous raw agricultural commodities including several food and feed additives.

Tolerances

Permanent tolerances for residues of chlorpyrifos [40 CFR 180.342] and its metabolite 3,5,6-trichloro-2-pyridinol [TCP], range from 0.05 ppm to 25 ppm on numerous agricultural commodities.

Permanent regional tolerances for residues of chlorpyrifos in/on asparagus have been established at 5 ppm. Use is limited to the States of Iowa, Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oegon, South Dakota, and the State of Washington.

¶ The applicant, Victoria Island Farms, is located in San Joaquin county, California.

Registered Use

LORSBAN®-4E is registered for use on asparagus for single pre-harvest foliar application at 1 lb a.i./A; two post-harvest applications to the fern stage† are permitted at the same rate. There is a one day PHI. The use of chlorpyrifos in/on asparagus is limited to the Central and Northwest Regional States shown under tolerances above.

Proposed Use

The proposed use for LORSBAN®-4E is to control the asparagus aphid during the fern stage of plant growth by application of 2 pts (1 lb a.i.) LORSBAN®-4E as a foliar spray in a minimum of 20 gal water/A. Apply with power operated ground spray equipement only.
Restriction: Only two post-harvest applications to the fern stages are permitted.

Nature of the Residue
The residue of concern in plants is the parent chlorpyrifos and its metabolite TCP. The nature of the residue in plants and animals has been adequately studied and reported (PP#3F1301 & PP#4F1445).

Analytical Methods

Analytical methods for enforcement are given in PAM II, Method VI for chlorpyrifos and in PAM II, Method VII for its metabolite, TCP. The limits of detection are 0.01 ppm and 0.05 ppm , respectively.

Residue Data

New residue data collected from a field test in California (El Centro, CA) were submitted. Four representative samples were foliar treated at the rate of 1 lb a.i./A(1X), with four applications. There was a one day PHI. The four asparagus spears were analyzed for the parent and TCP residues. The residues of chlorpyrifos were: 0.98 ppm, 1.22 ppm, 1.51 ppm, and 0.99 ppm: for its metabolite, TCP, the values were: 0.67 ppm, 0.68 ppm, 0.84 ppm, and 0.44 ppm. All values remained uncorrected. The control values for chlorpyrifos and TCP were 0.02 ppm and 0.05 ppm, respectively.

Recoveries from asparagus samples spiked with 0.1 ug, 0.2 ug, and 0.5 ug of chlorpyrifos were 99.0%, 96.5%, and 93.2%, respectively.

The method for detecting chlorpyrifos was a modification of PAM II, Method VI. Methanol was used in place of acetone; aqueous NaCl was added for the "salting out" effect; and petroleum ether replaced hexane for the partition. PAM II, Method VII was also slightly modified for the analysis of TCP. Florisil instead of alumina was used for the column clean-up. Methyl chloride and diethyl ether replaced benzene for the partitioning.

Two field studies were made in the State of WAshington in 1977 and 1979:

1977 Study: LORSBAN®-4E was applied at the rate of 0.75 lb(3/4X), 1.0 lb(1X), and 1.5 lb(1.5X) a.i./A. The asparagus spears were analyzed 18 months after harvest; samples were analyzed for chlorpyrifos only. The maximum value after one day PHI and treatment with 1.0 lb(1X) a.i./A was 0.60 ppm. The residue data

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† Fern Stage: Occurs between the planting of the crown and the harvesting of the asparagus spears.

obtained from this study were considered of questionable value because of the long storage period before being analyzed [Memo:R.Storherr, PP #2E2644, 7/8/82].

1979 Study: These samples were analyzed for the metabolite TCP only. Asparagus was again treated with LORSBAN®-4E at the rates of 1.0 lb(1X), 1.5 lb(1.5X), and 2.0 lb(2X) a.i./A. The samples were analyzed for TCP, net TCP, and total TCP. At one day PHI and 1.0 lb(1X) a.i./A, residues of TCP ranged from 0.64 to 0.97 ppm. To determine chlorpyrifos levels, TCP was divided by a factor of 0.56 [based on the molecular ratio of TCP to chlorpyrifos with the latter corr-sponding to one]. Based on this ratio the level of chlorpyrifos ranged from 1.14 to 1.73 ppm.

TCP residues in which the application rate of chlorpyrifos was 1.5 lb(1.5X) and 2.0 lb(2X) a.i./A with a one day PHI and after using the conversion factor, showed that the maximum chorpyrifos levels were 3.00 ppm and 5.28 ppm, respectively [Memo:R.Storherr, PP #2E2644, 7/8/82]

Indiana Study, 1982: Samples were analyzed for TCP only. Asparagus which had been treated with one lb(1X) a.i./A and 2 lb(2X) a.i./A of chlorpyrifos and harvested one, two, and three days after treatment yielded the following results:

	Chlorpyrifos Levels		
Treatment/a.i.	One day/PHI	Two days/PHI	Three days/PHI
(1X)	2.1 to 3.7 ppm	0.7 to 1.2 ppm	1.1 to 3.4 ppm
(2X)	3.9 to 5.7 ppm	0.35 to 4.11 ppm	0.35 ppm

The above results were obtained from the uncorrected TCP values and ratio conversion using the 0.56 factor. Samples from this Indiana study were analyzed by the IR-4 Northeast Regional Laboratory at Geneva, NY.

Based on the proposed use and for purposes of this Section 24(c) only, the residues of chlorpyrifos and its metabolite TCP are not likely to exceed the established regional tolerance of 5 ppm.

Conclusion and Recommendation

DEB concludes that the residues of chlorpyrifos plus TCP are not likely to exceed the established regional tolerance of 5 ppm in/on asparagus as a result of the proposed use.

cc: Reviewer;SF,Chlorpyrifos;RF;Sec.18 File;ISB/PMSD/Circulation. ~~TAS(Section)~~
RDI: E.Zager,Sec.Head,1/3/89;R.Schmitt,1/3/89.
TS-769: W.Anthony;wla;CM-2,Rm.812;X557-4351;1/3/89.