C. Harlow

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

JUL 24 1991

MEMORANDUM:

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

SUBJECT: ID #91-NM-0003. Chlorpyrifos: Section 18 crisis exemption for use on small grains (wheat, barley, and oats) grown in the State of New Mexico. [DEB:#8090; MRID:n/a][DP BARCODE 165042].

FROM: William L. Anthony, Chemist
Special Review Section II
Chemistry Branch II - Reregistration Support
Health Effects Division [H7509C]

THRU: F. B. Suhre, Section Head
Special Review Section II
Chemistry Branch II - Reregistration Support
Health Effects Division [H7509C]

TO: Andrea Beard, PM #41
Emergency Response Branch & Minor Use Section
Registration Division [H7505C]
and
Toxicology Branch
Health Effects Division [H7505C]

The New Mexico Department of Agriculture, has issued a Section 18 crisis exemption authorizing applications of the insecticide, chlorpyrifos (LORSBAN®, EPA Reg. #62719-23), to control the Russian Wheat Aphid (Diuraphis noxia) on small grains (wheat, barley, oats mainly the barley and oats.

Note: RSB indicates that the use pattern on wheat has already been reviewed by Chemistry Branch; New Mexico has already requested a specific exemption for wheat.

We have no record of having reviewed this specific exemption. We have previously reviewed a similar use pattern on wheat(89-WA-11,89-WY-02, J.Smith, 5/9/89; 89-TX-03, L. Cheng, 12/29/88; 88-CO-05, L. Propst, 9/14/88) and a different use pattern on small grains( 85-MT-04105, S. Malak, 4/15/85; Section 18, E. Zager, 4/28/81).

Application of the insecticide is limited to a maximum of 257,500 acres of wheat, 4000 acres of oats, and 1000 acres of barley. Treatment for oats and barley are restricted to Chaves and Eddy Counties. Treatment for wheat is restricted to the counties of Curry, Lea, Quay, Roosevelt, Union, and San Juan.

LORSBAN® [EPA Reg.#62719-23] contains 4 lbs of the active ingredient (ai), chlorpyrifos - [0,0-diethyl-0-3,5,6-trichloro-2-pyridyl phosphorothioate].

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 15 ppm for numerous raw agricultural commodities.
A tolerance of 0.6 ppm (of which no more than 0.3 ppm is chlorpyrifos) and its TCP metabolite in/on wheat grain is currently pending. Also a food additive tolerance of 2.0 ppm (of which no more than 1.0 ppm is chlorpyrifos) for the same residues in/on wheat milling fractions (except flour) is currently pending. [Memo: PP#3F2947/FAP#3H5411], F.Boyd;1/5/87]. Temporary tolerances fore wheat expired in 1982.

Tolerances are established for meat, fat, and meat-by-products of hogs and poultry (including turkeys) at 0.5 ppm; meat, fat, and meat by-products of cattle at 1.0 ppm; milk fat (representing 0.02 ppm in whole milk) at 0.5 ppm; and for eggs at 0.1 ppm.

A Second Round Review (SRR) Product/Residue Chemistry Chapter was completed 10/14/88.

PROPOSED USE

The proposed use for chlorpyrifos would permit a maximum of 262,500 lbs of the active ingredient to be applied at the rate of 0.5 lbs per acre per treatment. A maximum of two treatments per season would be made by ground (thorough coverage of crop foliage) or aerial equipment (not less than two gallons of water per acre).

Note: A 28 day PHI is required for feed items of wheat, barley, and oats. Exception: There is 14 day PHI for forage of barley and oats, which can be green chopped and fed to dairy cattle only.

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 in PP#3F1301 & PP#4F1445.
According to the SRR [10/14/88], the qualitative nature of the chlorpyrifos residues in both plants and animals is adequately understood.

Note: In a recent addendum to the residue chemistry chapter of the SRR [Memo:1/13/89, from D. Edwards [CBRS] to C.Kent, it was determined that TCP should be dropped from the tolerance expression. This position was affirmed by TOX [Memo: E.Doyle, TOX II, to R. Schmitt and E. Zager, 4/1/91]. Since the tolerance expression has yet to be changed, the residues of concern remain unchanged for purposes of this Sec 18.

ANALYSIS

According to the Secondary Round Review (SRR), adequate methods are available for enforcement. To determine chlorpyrifos in plants, methods I & II in PAM II may be used. To determine residues in animal tissues and milk, method V in PAM II is available.
The methods for determining residues of the metabolite TCP in tissues and plants are also found in PAM II, methods V & VI, respectively.

RESIDUES

Residue studies were conducted in the states of CA, ID, IL, KS, MI,ND, OR, TX, and WA. From a total of thirteen studies, eight were submitted for grain and five for forage. The following data were submitted in connection with PP#F2947, after treatment of wheat with LORSBAN®4E at a maximum rate of 1.5 lbs ai/A/per season:

| Crop | PHI (days) | Chlorpyrifos | TCP ppm | Combined |
|---|---|---|---|---|
| Grain | 28 | 0.23 | 0.38 | 0.61 |
| Straw | 28 | 4.20 | 1.60 | 5.80 |
| Forage | 14 | 2.30 | 0.23 | 2.50 |

Note: The method sensitivity for chlorpyrifos is 0.05 ppm except for grain and straw which is 0.01 ppm.
The method sensitivity for TCP is 0.05 ppm.

For the milling and breaking fractions the combined residues were: grain (2.1 ppm); flour (0.14 ppm); break shorts (1.4 ppm); red shorts (2.0 ppm); red dog (0.62 ppm); and bread (0.06 ppm).
We had previously concluded that the residues of chlorpyrifos and TCP were not likely to exceed the pending tolerances for chlorpyrifos at 0.6 ppm for grain; 5.8 ppm for straw; 3.0 ppm for wheat forage; and 2.0 ppm for the milling fractions.

For purposes of this Section 18 only, the residue data submitted for wheat and its processed products, would transfer to oats and barley.

We conclude that residues of chlorpyrifos and TCP are not likely to exceed 0.6 ppm in barley/oat grain; 5.8 ppm in barley/oats; 2.0 ppm in the milling fractions (other than flour) of barley/oats as a result of the proposed use. Barley/oat flour would contain <0.5 ppm.

The analyses for the residues of chlorpyrifos and TCP on wheat and its processed products were performed by Agricultural Products Department, Dow Chemical, Midland, Michigan.

MEAT, MILK, POULTRY, AND EGGS

For a discussion on chlorpyrifos feeding studies on dairy cattle, beef cattle, and pigs, see PP#F1306,and [Memo: F.Boyd, #F2947/#3H5411, 4/24/86] & [Memo: J. Smith, #89-WA-11, 5/9/89].

Dairy Cattle: Daily feeding levels of 1, 3, and 10 ppm of chlorpyrifos for 14 days, resulted in ND(<0.01 ppm) residue in whole milk. Feeding levels of 30 ppm, for 14 days, resulted in 0.02 ppm of chlorpyrifos residues at 0.02 ppm in whole milk.

Beef Cattle: These animals were fed daily, of 3, 10, 30, and 100 ppm of chlorpyrifos, daily, for 30 days. At the 10 ppm feeding level, the maximum residue level was 0.5 ppm in kidney; at the 30 ppm feeding level, the maximum residue in the liver was 1.7 ppm; at the 100 ppm level, a maximum of 5.0 ppm was found in beef fat. No analysis was made for TCP.

Pigs: Pigs were fed chlorpyrifos in daily diets at 0.3, 1, 3, and 10 ppm for 30 days. The 3 and 10 ppm feeding levels gave maximum residue values (parent plus TCP) of 0.08 ppm and 0.3 ppm, respectively, in liver.

Dietary Burden

Based on the dietary burden of cattle fed a diet of 70% forage and 30% grain; swine fed as diet of 90% grain; and poultry fed a diet of 70% grain and 10% bran, DEB had concluded that the existing tolerances for meat, milk, poultry and eggs would be adequate to cover any secondary residues of chlorpyrifos and TCP which might occur as a result of this emergency exemption.

CONCLUSIONS

(1) The nature of the plants and animals has been adequately studied. For purposes of this Section 18, the residues of concern are the parent chlorpyrifos and its metabolite, 3, 5, 6-trichloro-2-pyridinol.

(2) Adequate methods are available for enforcement to determine chlorpyrifos in plants; residues in animal tissues and milk; and residues of TCP in tissues and plants.

(3) Residues of chlorpyrifos and its TCP metabolite will not exceed 0.6 ppm in barley, oats, and wheat grain; 5 ppm in straw; 3 ppm in forage;2.0 ppm in milling fractions (except flour) and 0.5 ppm in flour as a result of this Section 18 use.

(4) The proposed use will result in secondary residues of chlorpyrifos and its metabolite (TCP) not exceeding the established tolerances for meat, fat, meat-by-products of cattle, goats, horses, sheep, hogs, and poultry (including turkey); eggs; and milk fat.

(5) Analytical Referenced Standards are available from the Pesticide & Industrial Chemicals Repository at Industrial Park, NC.

(6) The residue samples for chlorpyrifos and its metabolite (TCP) were analyzed by Agricultural Products Department, Dow Chemical Co., Midland, Michigan.

RECOMMENDATION

TOX considerations permitting, CBRS has no objections to this Section 18, providing a 28 day PHI is applied for feed items, of wheat, barley, and oats, except forage. A 14 day PHI is applicable for oats and barley green chopped forage fed to dairy cattle, only. An agreement should be made with the FDA regarding the legal status of the treated commodities in commerce.

Note: TOX has agreed that the chlorpyrifos tolerances should not include the TCP metabolite. However, the tolerance expression has not yet been changed to our knowledge.

CC: WLA;RF;SF[Chlorpyrifos, DURSBAN®];Chlorpyrifos Sec.18 file;SACB (Saito);(PIB/FOD);Circulate.
RDI: F.Suhre;S.Hummel,7/22/91;E.Zager,7/23/91.
H7509C: WLA;wla;Cry.Stat.,4th Fl;X308-8526;7/23/91.