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

MEMORANDUM

DEC 29 1988

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

SUBJECT: 89-TX-03. Section 18 Exemption. Chlorpyrifos on Winter Wheat. No MRID #. Branch # 4744.

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THRU: Edward Zager, Section Head *E. Zager*
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TO: Rob Forrest, PM Team 41
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The Texas Department of Agriculture has issued a Section 18 exemption for the use of Lorsban 4E* on winter wheat. The active ingredient is O,O-diethyl O-(3,5,6-trichloro-2-pyridyl)-phosphorothioate or chlorpyrifos.

The proposed use would allow up to two treatments of 1 pint of Lorsban 4E* (0.5 lb ai) per acre by ground, aerial or sprinkler irrigation equipment. A PHI of 28 days is imposed. Feeding of wheat forage and grazing are prohibited for at least 14 days after application. Feeding of wheat straw is not permitted for 28 days following application.

A similar request involving a single application of 1 pint of Lorsban 4E* per acre to winter wheat was made earlier by CO. Grazing would not be permitted within 14 days after application. No PHI was mentioned (88-CO-05, L. Propst, 9/14/88).

The Product/Residue Chemistry chapters for the Chlorpyrifos Second Round Review (SRR) were issued 11/18/88.

Tolerances are established for residues of chlorpyrifos and its metabolite 3,5,6-trichloro-2-pyridinol (TCP) in or on a variety of raw agricultural commodities ranging from 0.05 ppm (such as pears and peaches) to 15 ppm (such as alfalfa hay and soybean straw) [40 CFR 180.342].

In connection with PP3F2947/FAP3H5411, DEB recommended for the establishment of the proposed chlorpyrifos tolerances on wheat grain (1.0 ppm, of which no more than 0.5 ppm is chlorpyrifos), wheat straw (10 ppm, of which no more than 6 ppm is chlorpyrifos), wheat forage (5 ppm, of which no more than 3 ppm is chlorpyrifos), and milling fractions, except flour, of wheat (3 ppm, of which no more than 1.5 ppm is chlorpyrifos). See F. Boyd's review of 1/5/87.

Existing tolerances for meat and milk are 2.0 ppm for the meat, fat, and meat byproducts of cattle, 1.0 ppm for the meat, fat, and meat byproducts of goats, horses, and sheep, 0.5 ppm for the meat, fat, and meat byproducts of hogs and poultry (including turkeys), 0.1 ppm for eggs, and 0.5 ppm in milk fat, representing 0.02 ppm in whole milk.

According to the review of 1/20/84 in connection with PP3F2947/FAP3H5411 (F. Boyd), the metabolism of chlorpyrifos in plants and animals has been previously discussed in review of corn, beans, apples, soybeans, citrus, and grapes petitions. The metabolism of chlorpyrifos in plants is adequately understood and the Chlorpyrifos SRR reiterates that the residues of concern consist of chlorpyrifos and its metabolite TCP.

The major metabolites found in animals were also the parent compound and TCP (free and conjugated). The metabolism of chlorpyrifos is adequately understood and the residue of concern consists of chlorpyrifos and TCP (1/20/84 review). The Chlorpyrifos SRR also states that the qualitative nature of the residue in animals is adequately understood.

The analytical method used to generate the residue data for chlorpyrifos in/on wheat and wheat based products discussed below is that of Norton, E. J., 1980 "Residues of Chlorpyrifos and 3,5,6-trichloro-2-pyridinol in Wheat Grain, Straw, and Milling and Baking Fractions." The method uses flame photometric detection for chlorpyrifos and electron capture detection for TCP. Method sensitivity for chlorpyrifos was reported at 0.01 ppm for grain and 0.05 ppm for straw, and milling and baking fractions. This method is essentially the same as that listed in PAM II as Method II.

The analytical method used to determine chlorpyrifos in milk and animal tissues is that of Claborn, H. V., et al, "Dursban Determination in Milk and Body Tissues of Cattle," JAOAC 51:1243-1245, 1968. The method is listed in PAM II as Method IV. Method sensitivity for chlorpyrifos is 0.1 ppm. The analytical method for TCP in beef fat is listed in PAM II as Method V. Method sensitivity for TCP is 0.05 ppm.

No residue data were submitted with this request. Residue data were submitted in connection with the permanent tolerance

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petition. The following is a summary of the maximum residues in ppm of chlorpyrifos and TCP found in grain and grain-based products:

	lbs ai/A	PHI	parent	TCP	Total (ppm)
Grain	1.0+0.5	28	0.23	0.38	0.61
Straw	1.0+0.5	28	4.2	1.6	5.8
Forage	1 x 1	14	2.3	0.23	2.5

Milling and baking fractions

grain	3 x 0.5	14	0.55	0.25	0.8
			1.5	0.63	2.1
flour			0.08	0.06	0.14
break shorts			1.0	0.42	1.4
red shorts			1.4	0.62	2.0
red dog			0.47	0.15	0.62
bread			0.06	<0.05	0.06

On the basis of the above data, we conclude that residues of chlorpyrifos and TCP are not likely to exceed 0.6 ppm in the grain, 5 ppm in the straw, and 3 ppm in the forage, and 2 ppm in the milling fractions (except flour) of wheat as a result of 2 x 0.5 lb ai/A per season use. Flour would contain 0.1 ppm chlorpyrifos residues.

Meat, Milk, Poultry and Eggs

Wheat forage may constitute 70% of the dairy cattle diet which would be equivalent to 2.1 ppm of chlorpyrifos and TCP. Wheat straw may constitute 10% while wheat grain may constitute 50% of beef and dairy cattle's diet equivalent to 0.5 ppm and 0.3 ppm of chlorpyrifos and TCP, respectively. Wheat grain may also constitute up to 90% of finishing swine's diet (0.54 ppm total residues). Wheat bran may be fed to cattle at 25% of the diet, equivalent to 0.5 ppm of total residues in the diet. These intakes are relatively insignificant compared to exposure from alfalfa forage (80% x 15 ppm).

It was reported in PP3F1306 that no chlorpyrifos residues were found in whole milk after dairy cattle had been fed chlorpyrifos at levels of 1, 3, and 10 ppm in the diet for 14 days. Chlorpyrifos residues of 0.02 ppm were found in the whole milk after a 30 ppm feeding level. After withdrawal periods of 1-5 days, neither the milk nor the cream contained any detectable residues (L. Propst's review of 9/14/88).

Beef cattle were fed chlorpyrifos in the daily diets at levels of 3, 10, 30 and 100 ppm for 30 days. The feeding level of 3 ppm gave maximum residues of 0.16-0.23 ppm residues in

liver, and the 10 ppm level gave a maximum residue of 0.5 ppm in the kidney. The 30 ppm level gave a maximum residue of 1.7 ppm in the liver. At the 100 ppm level, a maximum of 5 ppm was found in the beef fat; this decreased to 0.04 ppm 35 days after cessation of feeding. It appears that no analyses were made for residues of TCP.

Pigs were fed chlorpyrifos in the daily diets at 0.3, 1, 3, and 10 ppm for 30 days. Combined residues were not detected in any tissues at the 1 ppm feeding level. The 3 and 10 ppm levels gave maximum residues of 0.08 and 0.3 ppm in liver. No residues were found in any tissues 21 days after cessation of feeding.

Based on the feeding studies we conclude the established tolerances are adequate to cover the total chlorpyrifos residues which might occur in milk and the fat, meat, and meat byproducts of cattle and swine as a result of this Section 18 use.

Wheat grain may constitute 70% of the poultry diet (0.42 ppm chlorpyrifos plus TCP) and wheat bran 10% of the diet (0.2 ppm total residues). On the basis of the poultry feeding study at 10 ppm dose level for chlorpyrifos in the diet, no residues were detected in eggs and the residues in fat and meat were below the 0.5 ppm tolerance (F. Boyd's 4/24/86 review, PP3F2947/3H5411).

We conclude the existing tolerances for eggs and the fat, meat, and meat byproducts of poultry will be adequate to cover any secondary residues of chlorpyrifos and TCP which might occur as a result of this Section 18 use.

CONCLUSIONS AND RECOMMENDATIONS

1. For the purposes of this Section 18 exemption, the residues of concern are the parent compound and its metabolite 3,5,6-trichloro-2-pyridinol in wheat, livestock, and poultry.
2. Adequate analytical methods are available for enforcement. The method listed in PAM II as Method II may be used for grain and grain based products. Methods IV and V may be used for animal commodities.
3. Residues of chlorpyrifos and its metabolite TCP are not likely to exceed 0.6 ppm in wheat grain, 5 ppm in wheat straw, 3 ppm in wheat forage and 2 ppm in the milling fractions (except flour) of wheat. Flour would contain 0.1 ppm residues.
4. Secondary residues of chlorpyrifos and its TCP metabolite will not exceed the established tolerances of 2.0 ppm for the meat, fat, and meat byproducts of cattle, 1.0 ppm for the meat, fat, and meat byproducts of goats, horses, and sheep, 0.5 ppm for the meat, fat, and meat byproducts of hogs and poultry

(including turkeys), 0.1 ppm for eggs, and 0.5 ppm in milk fat, representing 0.02 ppm in whole milk.

5. Reference standards of chlorpyrifos are available at the Pesticides and Industrial Chemicals Repository at RTP, NC.

TOX considerations permitting, DEB has no objections to this Section 18 request. An agreement should be made with FDA regarding the legal status of treated commodities in commerce.

cc:Circ, RF, Section 18 F, Stanton (SACB), Cheng, PMSD/ISB
RDI:EZager:12/29/88:RLoranger:12/29/88
TS-769:CM#2:Rm810:Cheng:12/29/88:1:/88