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

MAR 10 1982

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

SUBJECT: PP#2G2581/FAP#2H5325. Thiodicarb (Larvin) on cottonseed and soybeans. Evaluation of analytical method, residue data, and amendment of 2/26/82.

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THRU: Charles L. Trichilo, Chief
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TO: Jay Ellenberger, Product Manager #12
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and

Toxicology Branch
Hazard Evaluation Division (TS-769)

Union Carbide Ag. Products Co., Inc., requests the establishment of temporary tolerances for combined residues of thiodicarb (UC 51762; Larvin; dimethyl N,N'-[thiobis[(methylimino) carbonyloxy]]bis [ethanimidothioate]) and its metabolite methomyl (N-[(methyl-carbamoyl)oxy]thioacetimidate) in or on the following commodities:

cottonseed	0.4 ppm
soybeans	0.1 ppm
cottonseed hulls	0.8 ppm (food additive tolerance)
soybean hulls	0.4 ppm (food additive tolerance)

The same tolerance requests (plus a 0.2 ppm tolerance for soybean straw) were submitted in PP#0F2413. We recommended against establishment of those tolerances due to label inconsistencies, the lack of a feeding restriction for soybean hay, and insufficient identification of several inerts (A. Smith review, 1/21/81). In PP#9G2152 we recommended for temporary tolerances of 0.4 ppm in cottonseed, 0.1 ppm in soybeans, and 0.02 ppm in soybean straw (12/19/79, A. Smith). However, those tolerances (as well as those in the current petition) are not toxicologically supported (W. Dykstra, memos of 5/2/80 and 10/29/81).

Methomyl, the metabolite of thiodicarb, is an insecticide with established tolerances of 0.1-40 ppm on various commodities (40 CFR 180.253). These include tolerances of 0.1 ppm for cottonseed, 0.2 ppm for soybeans, and 10 ppm for soybean forage.

The EUP proposes application of 3989 lb ai thiodicarb on 510 acres of cotton and 182 lb ai on 140 acres of soybean in 1982. In 1983 the program would be expanded to entail application of 8181 lb ai to cotton and 445 lb ai to soybeans.

Conclusions

1. The nature of the residue in plants and animals has been adequately delineated. The residue of concern in plants and animals consists of the parent thiodicarb and its metabolite methomyl.

2. An adequate analytical method is available for determining residues of thiodicarb and methomyl in cottonseed, soybeans, hulls and by-products (meals, oils, soapstocks).

3. The proposed tolerances for combined residues of thiodicarb and its metaboite in cottonseed, cottonseed hulls, soybeans, soybean hulls and byproducts (oils, meals, soapstocks) are adequate.

4. Residues of thiodicarb, methomyl, and other carbamate-type metabolites are not likely to occur in eggs, milk, meat, fat and meat byproducts of cattle, goats, hogs, horses, poultry and sheep [Section 180.6(a)(3)]. TOX has concluded that residues of acetonitrile and acetamide in these commodities need not be regulated.

Recommendation

TOX considerations permitting we recommend for establishment of the proposed temporary tolerances.

Detailed Considerations

Manufacturing Process

[redacted]

Formulation

The proposed formulations Larvin 3.2 Thiodicarb Insecticide (33% ai, 3.2 lb ai/gal) and Larvin 500 Thiodicarb Insecticide (44% ai, 4.3 lb ai/gal) contain the [redacted]

MANUFACTURING PROCESS AND INERT INGREDIENT INFORMATION ARE NOT INCLUDED

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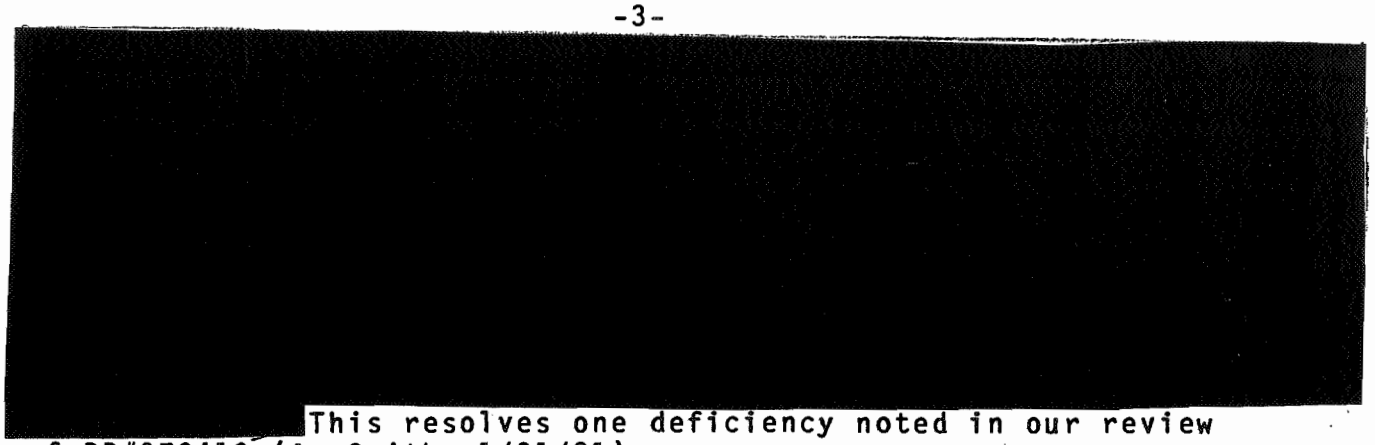

This resolves one deficiency noted in our review of PP#0F2413 (A. Smith, 1/21/81).

Proposed Use

To control numerous pests on cotton apply 0.3-0.9 lb ai/A (either formulation) and repeat as needed (usually 5-7 day intervals). Livestock are not allowed to graze treated fields. The PHI is 28 days on both labels.

For soybean pests apply 0.2-0.45 lb ai/A as needed. Do not feed forage to livestock. Do not apply less than 60 days before harvest. In the revised Section B submitted on 2/26/82 the petitioner has also restricted the feeding of soybean hay to livestock.

With the exception of the restriction on feeding soybean hay (requested in our PP#0F2413 review) these proposed uses are the same as those in that earlier petition.

The metabolite methomyl is registered for use on cotton (0.45-0.67 lb ai/A, 3 applications max., 15 day PHI) and soybean (0.22-0.45 lb ai/A, 14 day PHI).

As noted in our review of PP#0F2413, the registered uses of methomyl in soybeans could affect the level of thiodicarb in soybeans by showing a higher thiodicarb level than the proposed 0.1 ppm. For a permanent tolerance of thiodicarb this situation can be handled by a new paragraph under 40 CFR 180.3 (tolerances for related chemicals).

Nature of the Residues

Metabolism studies using ^{14}C-thiodicarb in/on cotton, soybeans, corn, wheat, cabbage, carrots, rats, cows and poultry are discussed in detail in our 1/21/81 review of PP#0F2413.

In summary, UC51762 is absorbed and translocated by plants. Extensive degradation and/or metabolism to the volatile compounds carbon dioxide and acetonitrile occur(s). To some extent the

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compound is degraded with the elements reincorporated into naturally occurring plant tissues. The residue of concern in plants consists of the parent and the metabolite methomyl. The oxime, sulfoxide and methylol metabolites of methomyl usually comprise less than 10% of plant residues. Conjugates and/or bound forms of metabolites also represent only a minor portion of the residue.

The radiolabel in animal tissues, milk and eggs was found to be in the form of acetamide, acetonitrile, and naturally occurring components (i.e., reincorporated) such as proteins and lipids. Carbamate residues were not found in these commodities. TOX has concluded (see memos of W. Dykstra, 6/8/81 and 7/8/81) that acetonitrile and acetamide need not be regulated or included in the tolerance for thiodicarb.

Analytical Method

The method for determining residues in cottonseed, soybeans and straw entails extraction, partitioning, column chromatography and basic hydrolysis to convert UC51762 and methomyl to methomyl oxime, which is determined by GC with a flame photometric detector in the sulfur mode.

For cottonseed, soybeans, cotton and soybean foliage, and seed byproducts control values were below method sensitivity (<0.02 ppm). Recoveries were adequate (73-95%) fpr 0.02-2.0 ppm fortifications of parent, methomyl and methomyl oxime in cottonseed and soybeans (see A. Smith review of PP#0F2413, 1/21/81).

Residue Data

No additional residue studies have been submitted with this petition. Residue data for soybeans and soybean byproducts are discussed in the A. Smith reviews of PP#9G2152 (12/19/79) and POP#0F2413 (1/21/81). We reiterate that these studies support the proposed tolerances of 0.1 ppm for thiodicarb in/on soybeans and 0.4 ppm for soybean hulls. Residues in soybean meal, oil, and soapstock will be covered by the 0.1 ppm tolerance for soybeans.

Residue data for cottonseed and cottonseed hulls are also discussed in the aforementioned reviews. The proposed tolerances of 0.4 ppm and 0.8 ppm for residues of thiodicarb plus its metabolite methomyl on cottonseed and hulls, respectively, are adequate.

Meat, Milk, Poultry and Eggs

Based on radiolabelled feeding studies for cattle and poultry and the anticipated dietary levels we previously concluded that the proposed use falls under Section 180.6(a)(3) (no residues expected) for thiodicarb, methomyl and carbamate type metabolites in meat, milk and eggs (A. Smith, 1/21/81, PP#0F2413). Residues of acetonitrile and acetamide could be present at levels of <0.002 ppm but as indicated previously are not of toxicological concern.

cc: R.F., Circu, Reviewer, FDA, TOX, EEB, EFB, Robert Thompson (Research Triangle Park, N.C.)
TS-769:RCB:Reviewer:R.Loranger:LDT:X77324:CM#2:RM:810:Date:3/9/82
RDI:Section Head:RJH:Date:3/3/82:RDS:Date:3/3/82