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

JAN 22 1986

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: PP#6E3323 (RCB #315) - Dimethoate on Brassica (cole) Leafy Vegetables - Evaluation of a Crop Group (V) Tolerance (Accession Number 074016)

FROM Michael P Firestone, Ph.D., Chemist
Tolerance Petition Section II
Residue Chemistry Branch
Hazard Evaluation Division (TS 769C)

TO Hoyt L Jamerson Minor Uses Officer
Registration Division (TS 767C)

and

Toxicology Branch
Hazard Evaluation Division (TS-769C)

THRU John H. Onley Ph.D , Section Head
Tolerance Petition Section II
Residue Chemistry Branch
Hazard Evaluation Division (TS-769C)

Interregional Research Project No 4 Assistant Coordinator, Dr W.L. Biehn, and National Director, Dr. R.H. Kupelian, on behalf of IR-4 and the Agricultural Experiment Station of California, request the establishment of a tolerance for residues of the pesticide chemical dimethoate [O,O-dimethyl-S-[(N-methylcarbamoyl)methyl]phosphorodithioate] including its oxygen analog [O,O-dimethyl-S-[(N-methylcarbamoyl)methyl] phosphorothioate] in or on the raw agricultural commodities (RAC's) of the Brassica (cole) Leafy Vegetables Crop Group (V) at 2.0 parts per million (ppm).

Dimethoate tolerances are established under 40 CFR 180.204 for all three of the crop group V representative commodities; broccoli, cabbage, and mustard greens at 2.0 ppm for each RAC.

In addition, 2.0 ppm dimethoate tolerances are also established for the Brassica (crop group V) RAC's collards and kale. All of these tolerances were established in conjunction with PP#385.

The intent of this petition is to establish a Brassica crop group (V) tolerance for dimethoate in order to include bok choy (Chinese cabbage) and kohlrabi, both considered minor use crops by the Agency in its Draft Policy Statement on Minor Use Pesticides (OPP-30099).

This petition contains no new residue data or analytical methods. Thus, it is based solely on the existence of 2.0 ppm dimethoate tolerances for various Brassica crop group (V) RAC's, including all three representative ones (see 40 CFR 180.34(f)(1)).

American Cyanamid Company, the registrant of the systemic insecticide-miticide dimethoate (Cygon®), has written a letter to the Agency authorizing EPA access to previously submitted dimethoate (EPA Company Number 241) data in support of this petition.

The Residue Chemistry Chapter of the Dimethoate Registration Standard was issued on September 30, 1982.

Conclusions

1. The proposed dimethoate use on kohlrabi and bok choy are sufficiently similar or identical to currently registered dimethoate uses on other Brassica (cole) leafy vegetables as to satisfy the crop grouping requirements cited under 40 CFR 180.34(f)(1).

2. The nature of the residue in plants and animals is considered adequately understood for the purposes of supporting this proposed Brassica crop group (V) tolerance. The residues of concern consist of dimethoate and its metabolite [O,O-dimethyl-S-[(N-methylcarbamoyl)methyl]phosphorothioate].

3. Adequate methologies are available in Volume II of the FDA Pesticide Analytical Manual (PAM-II) for enforcement of the proposed Brassica crop group (V) tolerance.

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4. Dimethoate tolerances for the Brassica RAC's broccoli, cabbage, cauliflower, collards, kale, and mustard greens are all established at 2.0 ppm (note: broccoli, cabbage, and mustard greens are the crop group (V) representative commodities). Based on the similarity of the established uses of dimethoate on these above crops with that proposed in this petition for use of kohlrabi and bok choy, Residue Chemistry Branch (RCB) concludes that the proposed crop group (V) tolerance of 2.0 ppm is adequate.

5. Since Brassica (cole) leafy vegetables are not major animal feed items, RCB concludes that secondary dimethoate residues in animal commodities resulting from the additional use of dimethoate on kohlrabi and bok choy are not likely to present a residue problem.

6. An International Residue Limit Status sheet is included with this review as Attachment 1. Although the United States tolerance expression (dimethoate and its oxygen analog) varies from the temporary Codex limit expression (sum of dimethoate and omethoate resulting from the use formothion, dimethoate, and omethoate) and the established Canadian limit expression (dimethoate and omethoate), the tolerance levels for Codex, Mexico, Canada, and the United State are all established or proposed at the same numerical value - 2.0 ppm. RCB does not recommend revising the established (40 CFR 180.204) tolerance expression at this time.

Recommendations

Toxicology Branch (TB) and Exposure Assessment Branch (EAB) considerations permitting, RCB recommends for the establishment of the proposed dimethoate tolerance in or on the RAC's of the Brassica (cole) Leafy Vegetables Crop Group (V) at 2.0 ppm.

Detailed Considerations

Manufacture and Formulation

The manufacturing process for technical dimethoate is discussed in conjunction with RCB's review of PP#4F1462 (see R. Quick memorandum of July 24, 1974). RCB does not expect impurities in the technical chemical to result in any residue problems.

The formulation proposed for use on kohlrabi and bok choy is Cygon® 400 (EPA Registration No. 241-233-AA), which contains 4 lb ai per gallon. All inerts are cleared under 40 CFR 180.1001.

Proposed Use on Kohlrabi and Bok Choy

For control of aphids on kohlrabi and bok choy, IR-4 proposes applying Cygon® 400 containing the active ingredient (ai) dimethoate at a rate of 0.5 pt (0.25 lb ai) per acre per application. Begin spray treatment when insects first appear and repeat at 7- to 14-day intervals as needed. Do not apply more than three applications per crop season and observe a minimum 14-day preharvest interval (PHI).

The above proposed use is the same as that which currently appears on the registered Cygon® 400 label for control of insects on the Brassica RAC's kale, collards, and mustard greens. The Cygon® 400 label use for cauliflower, broccoli, and cabbage allow an application rate of 0.25 to 0.5 lb ai/A (1 to 2x the proposed kohlrabi and bok choy application rate) and minimum PHI's of 7 days for cauliflower and broccoli and 3 days for cabbage.

Nature of the Residue

The metabolism of dimethoate in plants (beans, corn, cotton, olives, pears, and potatoes) and animals (rats, cows, and poultry) have been discussed in detail in conjunction with RCB's review of PP#6F1663 (see M. Nelson memorandum of November 5, 1975). A discussion of dimethoate metabolism can also be found in Menze's "Metabolism of Pesticides - Update III" (U.S. Department of the Interior, Fish and Wildlife Service, Special Scientific Report - Wildlife No. 232, 1980) and in the Dimethoate Registration Standard (September 30, 1982).

In plants, dimethoate is readily taken up and translocated, and metabolism occurs by competing hydrolytic and oxidative steps. The metabolism in animals is similar to that in plants.

The nature of the residue in plants and animals is considered adequately understood for the purposes of supporting the proposed Brassica crop group (V) tolerance. The residues of concern consist of dimethoate and its oxygen analog, dimethoxon.

Analytical Methodology

Several enforcement methods are discussed in the Dimethoate Registration Standard (September 30, 1982) and described in the Pesticide Analytical Manual - Volume II. These include both colorimetric and GLC/flame photometric methods suitable for determining dimethoate and dimethoxon.

RCB concludes that adequate methodologies are available for enforcement of the proposed Brassica crop group (V) tolerance.

Residue Data

No new residue data have been submitted with the subject petition.

Residue data generated on Brassica RAC's have been previously discussed in conjunction with PP#385 (see T. Woodward/D. Duffy memorandum of March 16, 1966; and J. Alpert memorandum of July 6, 1966) and the Dimethoate Registration Standard of September 30, 1982.

Data were generated on a variety of Brassica (cole) leafy vegetables, including broccoli, cabbage, cauliflower, collards, kale, and mustard greens.

RCB concludes that for three or less applications at rates of 0.25 lb ai/A, and PHI's of 14 days or more, dimethoate, plus dimethoxon residues in/on bok choy and kohlrabi will not exceed the proposed 2.0 ppm group (V) tolerance.

Since the use patterns for various Brassica RAC's are similar, and the established dimethoate tolerances for all Brassica RAC's are the same (i.e., 2.0 ppm), RCB concludes that the crop grouping requirements cited under 40 CFR 180.34(f)(1) have been satisfied for dimethoate use on Brassica (cole) crop group (V) RAC's.

Residues in Meat, Fat, Milk, Poultry, and Eggs

Since Brassica (cole) leafy vegetables are not major animal feed items, RCB concludes that secondary dimethoate residues in animal commodities resulting from the additional use of dimethoate on kohlrabi and bok choy are not likely to present a residue problem.

Other Considerations

An International Residue Limit Status sheet is included with this review as Attachment 1. Although the United States tolerance expression (dimethoate and its oxygen analog) vary from the temporary Codex limit expression (sum of dimethoate and omethoate) and the established Canadian limit expression (dimethoate and omethoate), the tolerance levels for Codex, Mexico, Canada, and the United States are all established or proposed at the same numerical value - 2.0 ppm. RCB does not recommend revising the established (40 CFR 180.204) tolerance expression at this time.

Attachment 1 - International Residue Limit Status Sheet

cc: R.F., Circu, MPFirestone, EAB, EEB, FDA, PMSD/ISB, PP#6E3323
RDI: JHOnley-1/14/86:RDSchmitt-1/14/86
RCB:TS-769:MPFirestone:CM#2:Rm800b:557-1991
typed by KENCO-1/21/86:edited by mpf-1/22/86

Attachment 1:

Tues
12/3/85

INTERNATIONAL RESIDUE LIMIT STATUS

CHEMICAL: dimethoate

PETITION NO.: 6E3323

CCPR NO.:

REVIEWER: Michael P. Firestone

Codex Status

☐ No Codex Proposal Step 6 or above

Residue (if Step 9): Sum of dimethoate and omethoate resulting from the use of formothion, dimethoate and omethoate

Crop(s)	Limit (mg/kg)
Vegetables (other than peppers, potatoes, tomatoes & sugar beets).	2*

Proposed U.S. Tolerances

Residue: dimethoate plus its oxygen analog (see 40 CFR 180.204)

Crop(s)	Tol. (ppm)
Brassica (cole) leafy vegetables	2.0

CANADIAN LIMIT

Residue: dimethoate and omethoate

Crop(s)	Limit (ppm)
broccoli, cabbages, cauliflower, kale, turnip greens	2

MEXICAN TOLERANCIA

Residue: dimethoate**

Crop(s)	Tolerancia (ppm)
broccoli, cabbage,	2

Notes: * temporary pending full ADI

** not clear from available information whether omethoate is include

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