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

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

JAN 23 1984

MEMORANDUM

SUBJECT: EPA Registration No. 100-607 Amended Registration for Metalaxyl on Cucurbits and Onions. Accession Nos. 251019 and 251020.

FROM: Nancy Dodd, Chemist Nancy Dodd
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

THROUGH: Charles L. Trichilo, Chief
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

TO: Henry Jacoby, PM-21
Fungicide-Herbicide Branch
Registration Division (TS-767)

and

Toxicology Branch
Hazard Evaluation Division (TS-769)

Ciba-Geigy requests an amended registration to allow soil application of the fungicide metalaxyl [N-(2,6-dimethylphenyl)-N-(methoxyacetyl)alanine methyl ester] on cucumbers, melons, squash, and onions. The amended use would allow a soil application of Ridomil 2E at a rate of 1-2 lb. a.i./A followed by foliar applications at rates of 0.125-0.25 lb. a.i./A/application. Ridomil 2E is presently registered for foliar applications at the rate of 0.125-0.25 lb. a.i./A on cucumbers, melons, squash, and onions. Ridomil 2E is also registered for application to bed surfaces of vegetable bedding plants (tomatoes, squash, cucumbers, and melons) at the rate of 0.5-1.0 lb. a.i./A as preplant broadcast spray before or at the time of seeding, followed by one application at the rate of 0.25 lb. a.i./A 10 days before pulling plants.

Tolerances of 1.0 ppm on cucumbers, melons, and squash, 3.0 ppm on dry bulb onions, and 10.0 ppm on green onions are established to cover residues resulting from foliar applications of metalaxyl.

Formulation

Ridomil 2E contains 25.1% N-(2,6-dimethylphenyl)-N-(methoxyacetyl)alanine methyl ester and 74.9% inerts. Ridomil 2E contains 2 lbs. a.i./gallon.

Proposed Use

Ridomil 2E will be applied as a soil application at seeding followed by foliar applications.

Soil Application to Cucumbers, Melons, Squash, Onions (dry bulb, green, and onions grown for seed)

Soil applications may be banded over the rows, broadcast, or incorporated into the top 2 inches of soil. Apply soil applications at a broadcast rate of 4-8 pts. Ridomil 2E/A (1-2 lb. a.i./A) in 20-50 gals. of water.

Foliar Application to Cucumbers, Melons, Squash

Apply 1/2-1 pt. Ridomil 2E/A (0.125-0.25 lb. a.i./A) as a tank mix with the lowest labeled rates of Bravo 500, Dithane M-22, Manzate, Dithane M-45, or Manzate 200 or 1/2 pt. Ridomil 2E/A (0.125 lb. a.i./A) with registered rates of those products in sufficient water to obtain thorough coverage. Foliar applications may be made with Ridomil MZ58 rather than the tank mixes. Start applications when plants are in the two-leaf stage and continue at 14-day intervals throughout the season. Do not apply tank mixes with Dithane M-22, Manzate, Dithane M-45, or Manzate 200 within 5 days of harvest. Do not apply more than 6 pts. Ridomil 2E/A/season (1.5 lb. a.i./A/season) as foliar applications. Do not exceed a total of 12 pts. Ridomil 2E/A/season or equivalent (3 lb. a.i./A/season) including both soil and foliar applications.

Foliar Applications to Onions (dry bulb and onions grown for see)

Apply 1/2-1 pt. Ridomil 2E/A (0.125-0.25 lb. a.i./A) as a tank mix with the lowest labeled rates of Bravo 500, Dithane M-22, Manzate, Dithane M-45, or Manzate 200 or 1/2 pt. Ridomil 2E/A (0.125 lb. a.i./A) with the registered rates of these products in sufficient water to obtain coverage. Ridomil MZ58 may be applied instead of the tank mixes. Begin when conditions favor disease development and continue at 14-day intervals throughout the season. Do not apply more than 5 pts. Ridomil 2E/A/season (1.25 lb. a.i./A/season) as a foliar application. Do not apply more than a total of 12 pts. Ridomil 2E/A/season or equivalent (3 lb. a.i./A/season) including both soil and foliar sprays. Observe a 7-day PHI.

Foliar Applications to Onions (green)

Apply 1/2-1 pt./A Ridomil 2E (0.125-0.25 lb. a.i./A) as a tank mix with the lowest rates of Bravo 500, Dithane M-22, or Manzate or 1/2 pt. Ridomil 2E/A (0.125 lb. a.i./A) with the registered rates of these products in sufficient water to obtain thorough coverage. Begin when conditions favor disease development and continue at 14-day intervals throughout the season. Do not apply more than 3 pts. Ridomil 2E/A/season (0.75 lb. a.i./A/season) as foliar applications. Observe a 7-day PHI for tank mixes with Dithane M-22 or Manzate. Observe a 14-day PHI for tank mixes with Bravo 500.

Rotational Crops

If replanting is necessary after a soil application, the following time intervals apply provided the crops have registered labels: Replant tobacco and cotton immediately. Replant tomatoes, cucumbers, melons, squash, or onions immediately provided that no more than 4 pts. Ridomil 2E were applied to the soil. Do not make a second application of Ridomil in the above cases. Tobacco, cotton, avocadoes, non-bearing citrus, non-bearing deciduous fruits and nuts, conifers in nurseries, and certain vegetable crops (i.e., potatoes, tomatoes, cucumbers, melons, squash, and onions) may be planted in the fall following application of Ridomil. Small grain cover crops may also be planted during the fall following application provided they are plowed down and not used for food or feed. Corn, root crops, tobacco, cotton, avocadoes, non-bearing citrus, non-bearing deciduous fruit and nuts, conifers in nurseries, and certain vegetable crops (i.e., potatoes, tomatoes, cucumbers, melons, squash, and onions) may be planted the year following treatment. Other crops may be planted 18 months after applicaion.

These restrictions are acceptable provided tolerances are established for tomatoes, corn, and root crops before or concurrently with the uses proposed here.

Metabolism

Plants

Metabolism of metalaxyl in letttuce was reviewed in connection with PP#2F2762 (K. H. Arne, 1/6/83) and PP#1F2500 (P. Errico, 3/9/82). Other metabolism studies were on potatoes (PP#1F2500, P. Errico, 3/9/82 and PP#8G2121, G. Makhijani, 3/29/79) and grapes (PP#1F2500, P. Errico, 3/9/82). It was concluded (K. Arne, 1/6/83, PP#2F2762) that residues of

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concern in lettuce, grapes, and potatoes are similar and consist of parent plus metabolites containing the 2,6-dimethylaniline moiety [to include N-(2-hydroxymethyl-6-methylphenyl)-N-(methoxyacetyl)-alanine, methy ester (CGA94689)]. (PP#2F2762, Accession #071108; PP#1F2500, Accession #070018; PP#8G2121, Accession #097388 and 097387.

We conclude that residues of concern in onions, squash, cucumbers, and melons are parent plus metabolites containing the 2,6-dimethylaniline moiety [to include N-(2-hydroxymethyl-6-methylphenyl)-N-(methoxyacetyl)-alanine, methyl ester (CGA 94689)].

Analytical Method

The analytical method AG-395 determines combined residues of metalaxyl and its metabolites which contain the 2,6-dimethylaniline moiety. The sample is extracted with aqueous methanol. Dry crops are extracted by refluxing with 80% (v/v) methanol/H_2O for 2 hours. The residue is refluxed with methanesulfonic acid. The extract is basified. The resulting 2,6-dimethylaniline is steam distilled. The product is cleaned up with a silica Sep-Pack cartridge before analysis by capillary gas chromatography using a nitrogen/phosphorus detector operated in the nitrogen-specific mode. The limit of detection of method AG-395 is 0.05 ppm. Recoveries were 76-97% in green onions (whole plant) at fortification levels of 0.21-1.0 ppm, 70-104% in onion bulbs at fortification levels of 0.05-0.5 ppm, 46-88% in cucumbers at fortification levels of 0.05-2.0 ppm, 74-113% in cantaloupes at fortification levels of 0.05-0.5 ppm, 67-69% in honeydew melons at fortification levels of 0.05-0.5 ppm, and 74-104% in squash at fortification levels of 0.05-1.0 ppm.

Method AG-395 is an improvement of method AG-348, which was previously reviewed (PP#2F2762, K. H. Arne, 1/6/83 and PP#1F2500, P. Errico, 3/9/82).

Residues found in cucumbers and green onions using methods AG-348 and AG-395 are similar. A successful method tryout of AG-348 on cottonseed, liver, and milk has been completed (memo of K. Arne, 12/82).

We conclude that adequate analytical methods are available for analysis of metalaxyl on cucurbits and onions.

Residue Data

Onions (green)

Five studies were conducted on green onions in the states

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of NY, CA, MI, FL, and TX. Ridomil 2E was applied at planting at the rate of 2 lb. a.i./A and then three to four foliar applications of Ridomil MZ58 were made at the rate of 0.2 lb. metalaxyl a.i./A (1.16 lb. a.i./A including both metalaxyl and mancozeb). The foliar applications were approximately at 14-day intervals, ranging from 8-20 days. Green onions were sampled 7 and 10-11 days after the last foliar application. Samples were stored frozen. Total metalaxyl residues at a 7-day PHI were 0.60-4.34 ppm. Total metalaxyl residues at a 10 or 11-day PHI were 0.66-4.57 ppm.

We conclude that residues in green onions resulting from the proposed use will not exceed the established tolerance of 10.0 ppm on green onions.

Onions (bulb)

Five studies were conducted on bulb onions in the states of NY, MI, TX, CA, and FL. Ridomil 2E was applied at planting at the rate of 2 lb. a.i./A and then 5 foliar applications of Ridomil MZ58 were made at the rate of 0.2 lb. a.i. metalaxyl/A (1.16 lb. a.i./A including both metalaxyl and mancozeb). The foliar applications were at approximately 14-day intervals, ranging from 8-20 days. Bulbs were sampled 7 and 10 or 11 days after the last foliar application. Samples were stored frozen. Total metalaxyl residues at a 7-day PHI were <0.05-2.20 ppm. Total metalaxyl residues at a 10-11 day PHI were <0.05-2.08 ppm.

We conclude that residues resulting from the proposed use will not exceed the established tolerance of 3.0 ppm on dry bulb onions.

Squash

Three studies were conducted on squash in the states of FL, NE, and CA. Ridomil 2E was applied at planting at the rate of 2.0 lb. a.i./A, followed by five foliar applications of Ridomil MZ58 at the rate of 0.2 lb. metalaxyl a.i./A (1.16 lb. a.i./A including both metalaxyl and mancozeb). The foliar applications were made at approximately 14-day intervals, ranging from 9-16 days. Squash were sampled at 0 and 5 days after the last foliar application. Samples were stored frozen. Total metalaxyl residues at a 0-day PHI were <0.05-0.25 ppm. Total metalaxyl residues at a 5-day PHI were 0.08-0.43 ppm.

We conclude that residues in squash resulting from the proposed use will not exceed the established tolerance of 1.0 ppm on squash.

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Cucumbers

Four studies were conducted on cucumbers in the states of FL, NE, NY, and CA. Ridomil 2E was applied at planting at the rate of 2.0 lb. a.i./A and then five foliar applications of Ridomil MZ58 were made at the rate of 0.2 lb. metalaxyl a.i./A (1.16 lb. a.i./A including both metalaxyl and mancozeb). The foliar applications were made at approximately 14-day intervals, ranging from 9-18 days. Cucumbers were sampled at 0 and 5 days after the last foliar application. Samples were stored frozen. Total metalaxyl residues at a 0-day PHI were 0.05-0.51 ppm. Total metalaxyl residues at a 5-day PHI were 0.08-0.30 ppm.

We conclude that residues in cucumbers resulting from the proposed use will not exceed the established tolerance of 1.0 ppm on cucumbers.

Melons

Three studies were conducted on cantaloupes and honeydew melons in the states of FL and CA. Ridomil 2E was applied at planting at the rate of 2.0 lb. a.i./A, followed by five foliar applications of Ridomil MZ58 at the rate of 0.2 lb. metalaxyl a.i./A (1.16 lb. a.i./A including both metalaxyl and mancozeb). The foliar applications were made at approximately 14-day intervals, ranging from 11-19 days. Melons were sampled at 0 and 5 days after the last foliar application. Samples were stored frozen. Total metalaxyl residues on cantaloupes (CA and FL) were 0.14-0.43 ppm at a 0-day PHI and <0.05-0.25 ppm. at a 5-day PHI. Total metalazyl residues on honeydew melons (CA) were <0.05-0.07 ppm at a 0-day PHI and <0.05-0.05 ppm at a 5-day PHI.

We conclude that residues in melons resulting from the proposed use will not exceed the established tolerance of 1.0 ppm on melons.

Meat, Milk, Poultry, and Eggs

There are no animal food items involved in this proposed use on cucurbits (melons, cucumbers, and squash) and onions. Therefore, this use falls in category 3 of Section 180.6(a) with respect to residues in meat, milk, poultry, and eggs.

Conclusions

1. Plant metabolism is adequately defined. Residues of concern in curcurbits (squash, cucumbers, and melons) and onions are parent plus metabolites containing the 2,6-dimethylaniline moiety [to include N-(2-

hydroxymethyl-6-methylphenyl)-N-(methoxyacetyl)alanine, methyl ester (CGA 94689)].

2. Adequate analytical methods are available for analysis of metalaxyl on cucurbits and onions.

3. Combined residues of metalaxyl and its metabolites containing the 2,6-dimethylaniline moiety and N-(2-hydroxymethyl-6-methylphenyl)-N-(methoxyacetyl) alanine methyl ester resulting from the proposed use will not exceed the established tolerances of 10.0 ppm on green onions, 3.0 ppm on dry bulb onions, and 1.0 ppm on squash, cucumbers, and melons.

4. There are no feed items involved in this proposed use on cucurbits (melons, cucumbers, and squash) and onions. Therefore, this use falls in category 3 of Section 180.6(a) with respect to residues in meat, milk, poultry, and eggs.

5. The proposed rotational restrictions are acceptable provided tolerances are established for corn and root crops before or concurrently with the uses proposed here.

Recommendation

We recommend for the proposed use of metalaxyl on cucurbits (cucumbers, melons, and squash) and onions.

cc: Metalaxyl SF, Amended Use File
PP#2F2762,Reviewer
R.F.
Circu
Reviewer
Subject S.F.
Amended Use File
RDI:Section Head:EJ:Date:1/10/84:RDS:Date:1/11/84
TS-769:RCB:Reviewer(nd):Typist (mar)RM:810:CM#2:Date:(1/18/84)
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