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

DEC 8 1983

OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM:

SUBJECT: EPA Reg. No. 100-607. Amended Registration for Metalaxyl on Lettuce and Spinach. (Accession No 251021)

FROM: Nancy Dodd, Chemist *Nancy Dodd*  
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Hazard Evaluation Division (TS-769)

THRU: Charles L. Trichilo, Chief *CT*  
Residue Chemistry Branch  
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TO: Henry Jacoby, P.M. No. 21  
Fungicide-Herbicide Branch  
Registration Division (TS-767)

and

Toxicology Branch  
Hazard Evaluation Division (TS-769)

Ciba-Geigy requests an amendment to allow soil application of the fungicide metalaxyl [N-(2,6-dimethylphenyl)-N-(methoxyacetyl) alanine methylester] on lettuce and spinach. The proposed tolerances of 5.0 ppm on head lettuce and 10.0 ppm on spinach to cover residues resulting from foliar application are pending (PP#2F2762, K. H. Arne, 1/6/83). The amended use would allow a soil application at 1.0-2.0 lb. a.i./A followed by foliar applications at 0.125-0.25 lb. a.i./A/application with a maximum of 0.75 lb a.i./A/season.

Temporary tolerances of 5 ppm on head lettuce and 10 ppm on spinach are established and will expire on 1/4/84. Tolerances on various commodities are established ranging from 0.02 ppm in milk to 10 ppm in green onions. Various tolerances are pending. Various temporary tolerances are established and due to expire on 1/4/84.

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.

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### Proposed Use

Ridomil 2E will be applied as a soil application at seeding followed by foliar applications. Soil applications may be banded over the rows, broadcast, or incorporated in the top 2 inches of the soil. Apply soil applications at a broadcast rate of 4-8 pts./A Ridomil 2E (1.0-2.0 lb ai/A) in 20-50 gals. water. For foliar applications apply 1/2-1 pt./A Ridomil 2E (0.125-0.25 lb. ai./A) as a tank mix with the lowest label rates of Dithane M-22 or Manzate in sufficient water to obtain thorough coverage. Apply the tank mix at 14-day intervals as needed but do not apply more than 3 pts./A Ridomil 2E per season (0.75 lb. ai./A/season) as a foliar application or make the last application within 7 days of harvest. Do not apply more than 11 pts. Ridomil 2E/A/season (2.75 lb. ai./A/season) including both soil and foliar applications.

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, lettuce, and spinach immediately provided no more than 4 qts. Ridomil 2E were applied to the soil. Do not make a second application in the above cases. Tobacco, cotton, avocados, nonbearing citrus, nonbearing deciduous fruits and nuts, conifers in nurseries, and certain vegetable crops (ie. cucumbers, melons, squash, onions, potatoes, tomatoes, head lettuce, and spinach) may be planted in the fall following application of Ridomil. Small grain cover crops may be planted during the fall following application provided they are plowed down and not used for food or feed. Corn, root crops, tobacco, cotton, avocados, nonbearing citrus, nonbearing deciduous fruits and nuts, conifers in nurseries, and certain vegetable crops (ie. cucumbers, melons, squash, onions, potatoes, tomatoes, head lettuce, and spinach) may be planted the year following treatment. Other crops may be planted 18 months after application.

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 lettuce 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).

We concluded (K. Arne, 1/6/83, PP#2F2762) that residues of concern in lettuce and spinach 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. 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 72-97% in spinach at fortification levels of 0.2-2.0 ppm and 75-103% in lettuce 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).

Method AG-395 gives better recoveries than method AG-348 from lettuce fortified with CGA94689. 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 spinach and lettuce.

#### Residue Data

##### Spinach

Six studies on spinach were conducted in the states of NY, FL, TX, CA, and NB. Ridomil 2E was applied at planting as a preemergence broadcast application at the rate of 2.0 lb ai/A. Then Ridomil MZ58 containing metalaxyl and mancozeb was applied 3-5 times at approximately 14-day intervals as foliar applications at the rate of 0.2 lb. metalaxyl ai/A (1.16 lb. ai/A including both metalaxyl and mancozeb as active ingredients). Preharvest intervals were 7, 11, or 14 days. Residues in spinach after application of 2.6-3.0 lb. ai./A were 0.36-9.15 ppm at a 7-day PHI, 3.15-4.0 ppm at an 11-day PHI (one study), and 0.37-8.08 ppm at a 14-day PHI.

We conclude that 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 proposed tolerance of 10 ppm on spinach.

### Lettuce

Six studies on head lettuce were conducted in the states of NY, FL, TX, CA, and NB. Ridomil 2E was applied at planting as a preemergence broadcast application at the rate of 2.0 lb. a.i./A in a volume of 20-97 gals./A. Then Ridomil MZ58 containing metalaxyl and mancozeb was applied 4-5 times at approximately 14-day intervals as foliar applications at the rate of 0.2 lb. metalaxyl a.i./A (1.16 lb. ai/A including both metalaxyl and mancozeb as active ingredients). Pre-harvest intervals were 7 or 14 days. Residues in whole untrimmed heads after application of 2.8-3.0 lb. ai./A were 0.06-4.25 ppm at a 7-day PHI and 0.05-3.99 ppm at a 14-day PHI.

Available data indicate that 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 proposed tolerance of 5 ppm on head lettuce.

### Meat, Milk, Poultry, and Eggs

No food or feed item is involved in this proposed use on lettuce and spinach. 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 lettuce and spinach are parent plus metabolites containing the 2,6-dimethylaniline moiety [to include N-(2-hydroxymethyl-6-methylphenyl)-N-(methoxyacetyl)-alanine methyl ester.
2. Adequate analytical methods are available for analysis of metalaxyl on spinach and lettuce.
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 proposed tolerance of 10 ppm on spinach.

4. Available data indicate that 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 proposed tolerance of 5 ppm on head lettuce.
5. No food or feed item is involved in this proposed use on lettuce and spinach. Therefore, this use falls in category 3 of Section 180.6 (a) with respect to residues in meat, milk, poultry, and eggs.
6. The proposed rotational restrictions are acceptable provided tolerances are established for corn and root crops before or concurrently with the uses proposed here.

#### Recommendations

We have no objections to the proposed use provided the proposed metalaxyl tolerances of 5 ppm for lettuce and 10 ppm for spinach are established.

TS-769:RCB:N.Dodd:cdw:CM#2:Rm810:X77324:12/5/83

cc: Metalaxyl SF., Amended Use SF., Reviewer, RF, Circu., PP#2F2762

RDI: R. Hummel, 12/5/83; R. Schmitt, 12/5/83