



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

MAR 5 1987

OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: PP# 7E3467, RCB# 1563, Acc.# 265509, Benomyl in  
or on Pistachios. Evaluation of Analytical  
Method and Residue Data.

FROM: Jesse E. Mayes, Chemist *JEM*  
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Hazard Evaluation Division (TS-769)

THRU: John H. Onley, Ph. D., Section Head *John H. Onley*  
Residue Chemistry Branch  
Hazard Evaluation Division (TS-769)

TO: Hoyt Jamerson, PM Team 43  
Registration Division (TS-767)

and

Toxicology Branch  
Hazard Evaluation Division (TS-769)

The petitioner, IR-4, on behalf of the IR-4 National Director, Dr. R. H. Kupelian, and the Agricultural Experiment Station of California request the establishment of a tolerance for residues of the fungicide benomyl (methyl-1-(butylcarbamoyl)-2-benzimidazolecarbamate) and its metabolites containing the benzimidazole moiety (calculated as benomyl) in or on the raw agricultural commodity pistachio at 0.2 ppm.

Tolerances have already been established for residues of benomyl on numerous commodities (40 CFR 180.294) ranging from 0.1 ppm on meat, milk, poultry and eggs to 50 ppm on bean vine forage. Included in these established tolerances is a level of 0.2 ppm for the crop group nuts. A letter of September 30, 1986 to

PMSD/ISO  
1410

Mr. Hoyt Jamerson authorizes the Agency to refer to Du Pont data to support this petition. The letter was signed by Marie M. Hodge, Registration and Regulatory Affairs, Agricultural Products Department, E.I. Du Pont De Nemours and Company Incorporated.

The benomyl registration standard was completed in September, 1984. Several data gaps, including the need for additional metabolism studies and storage stability studies, are noted in the standard. In addition, residue data for several crops for which tolerances are established are needed. However, the benomyl registration standard finds that the presently established tolerance for the tree nuts group is adequate.

### Conclusions

1. The nature of residue in plants is adequately understood for purpose of this petition.
2. Adequate analytical methods are available in the Pesticide Analytical Manual (Vol. II) to enforce the proposed 0.2 ppm benomyl tolerance on pistachio.
- 3a. For the proposed use only, residue Data already submitted on the crop group nuts will be extended to support the proposed tolerance of 0.2 ppm benomyl telorance on pistachio.
- 3b. Since the chemical is applied at bloom, RCB concludes that the petitioner should submit a revised Section B deleting reference to a 21 day PHI (see Proposed Use Section of this review).
4. Pistachio is not considered a feed item so no secondary residues are expected to result in meat, milk, poultry or eggs from the proposed use .
5. An International Residue Limit Status Sheet is attached. According to the status sheet, there are no Canadian, Mexican or Codex limits for benomyl on pistachio.

### Recommendations

Upon receipt of a new Section B, revised in accordance with 3b above, RCB will recommend that the proposed tolerance for residues of the fungicide benomyl (methyl-1-(butylcarbamoyl)-2-benzimidazole carbamate) and its metabolites containing the benzimidazole moiety (calculated as benomyl) in or on the raw agricultural commodity pistachio at 0.2 ppm be established for use in the state of California.

## DETAILED CONSIDERATIONS

### Formulation

The formulation to be used on pistachios is Benlate® 50% WP. The formulation and manufacturing process is discussed in detail in the RCB review of PP# 4F1466. The technical grade product is >95% benomyl.

### Proposed Use for Pistachios

Benomyl is to be applied with ground equipment at the rate of 1.5 lbs. Benlate® (0.75 lbs. ai) per acre or 0.75 lbs. Benlate® (0.375 lbs. ai) per 100 gal. and applying the resulting spray mixture at the rate of 200 gals. per acre. Only one application is to be made which is at the time of bloom with a PHI of no less than 21 days.

Established uses on macadamia nuts and almonds require that no application be made after the bloom period. For pecans, no application can be made after the shuck splits.

Since only one application is made at the time of bloom, RCB recommends that the petitioner delete reference to a 21 day PHI. The petitioner should submit a revised Section B reflecting this change.

### Nature of Residue

No residue data were submitted with this petition. However, data on the metabolism of benomyl have already been reviewed. The metabolism and degradation of benomyl in beans, cotton, apples, oranges and cucumbers, by foliar uptake, were considered adequately defined in the RCB review of PP# OG0936 (2-20-70, W. J. Boodee). Those studies indicated that benomyl metabolized to methyl-2-benzimidazole carbamate (MBC) and 2-aminobenzimidazole (2-AB).

RCB has concluded in recent petition submissions requesting tolerances for residues of benomyl on minor crops that the nature of residue was adequately understood. RCB reiterates that conclusion for this use on pistachios.

However, for major crops involving high dietary exposure, other issues as stated in the Agency's Residue Chemistry Data Chapter

(September 25, 1984, updated October 9, 1985) of the Benomyl registration Standard must be resolved.

#### Analytical Method

No analytical method was indicated with this petition. However analytical methods are available in the FDA Pesticide Analytical Manual (Vol. II) for determining residues of benomyl and its metabolites in plants.

A fluorometric method was originally published by Pease and Gardiner and later improved by Pease and Holt, Journal AOAC, 54, 1399-1402 (1971) (see PP# 2F1240 (memo of 5-3-72, D.V. Reed) for details). Also, a method was published by Kirkland et al., J. Agric. and Food Chem. 21, 368 (1973). Both methods have undergone successful method trials.

RCB considers the available analytical methodology adequate for regulating benomyl residues on pistachios.

#### Residue Data

No residue data were submitted with this petition. The petitioner proposes to rely on data already submitted for the crop group nuts.

Data used to support the tolerance for residues of benomyl on the crop group nuts as reported in PP# 2F1240 (5-3-72, D.V. Reed) were based on the following use pattern:

##### Pecans

Full coverage spray at 0.25-0.5 lb act/A; first application at prepollination when young leaves are unfolding, second when small nuts are forming, thereafter at 3-to-4 week intervals; not to be applied after shucks split.

Macadamia nuts in Hawaii. Full coverage spray at 0.63-0.88 lb act/A; surfactant may be added to improve foliage wetting; begin applications one to two weeks prior to bloom, repeat at 1-to-2 week intervals through bloom period.

##### Almonds

Full coverage spray at 0.50-0.75 lb act/A; first appli-

cation as delayed dormant spray (at bud swell) or at pink bud; under severe disease potential, make second application between half-and full-bloom.

The petitioner indicates that he was informed by EPA (personal conversation between Richard D. Schmitt and Harold Alford) that tree nut crop group residue data can be extended to pistachio when the chemical is applied 21 days before harvest. What Dr. Schmitt recollects of his discussion with Mr. Alford is his stating that data might be extrapolated to pistachios if the application is made before the shells split. However, in this case, since the single proposed application is at bloom, a PHI of 21 days is not necessary and should be taken off the label.

The above uses on pecans, almonds, and macadamia nuts appear to be ones that could result in somewhat higher residues than would be expected from the proposed use pattern for pistachios wherein only one 0.75 lb. ai/A application is made at the time of bloom.

RCB concludes that existing residue data on tree nut crop group when compared to the current use pattern for pistachio are adequate to support this proposed 0.2 ppm tolerance on pistachios since bloom occurs well before the shells split. However, RCB must state that this conclusion does not mean that RCB has concluded that pistachio nuts should be included in the tree nut crop under 40 CFR 180.34 (f) (9) (XIV) (see RCB's (R. Cook) review of 2/28/85-IR-4 Crop Grouping Opinion Request). If the proposed use is ever changed so that the pistachio crop is exposed to more benomyl, then actual residue data on pistachios would probably be required.

#### Meat, Milk, Poultry and Eggs

Pistachio nut meat is not considered as a food item. Hence, there are no expected secondary residues in meat, milk, poultry or eggs.

#### Other Considerations

An International Residue Limit Status sheet is attached. There is no Codex tolerance or proposal above step 6 for residues of benomyl on nuts. There are no Canadian or Mexican limits for benomyl on pistachio nuts. Hence, there is no compatibility problem.

cc: R.F., S.F., J. Mayes, 7E3467, Cir., EAB, EEB, FDA, PMSD/ISB  
RDI: JHO, 2/23/87; RDS, 2/25/87  
TS-769:RCB:CM2:RM810:X1991:JEM:jm:3/02/87

INTERNATIONAL RESIDUE LIMIT STATUS

CHEMICAL Benomyl

CODEX NO. 69

CODEX STATUS:

☒ No Codex Proposal  
Step 6 or above (on nuts)

Residue(if Step 8): \_\_\_\_\_

Carbendazim (MBC)

<u>Crop(s)</u>	<u>Limit</u> <u>(mg/kg)</u>
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J. Lee  
4/3/87

PROPOSED U.S. TOLERANCES:

Petition No. 7E3467

RCB Reviewer Jesse E. Manges

Residue: Methyl-1-(butylcarbamoyl)-

2-benzimidazolecarbamate) and  
met. contg. benzimidazole moiety  

<u>Crop(s)</u>	<u>Limit</u> <u>(mg/kg)</u>
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Pistachio nuts

0.2 ppm

CANADIAN LIMITS:

☒ No Canadian limit (on nuts)

Residue: benomyl, carbendazim and  
thiophanate-methyl, expressed as  
carbendazim

<u>Crop(s)</u>	<u>Limit</u> <u>(mg/kg)</u>
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MEXICAN LIMITS:

☐ No Mexican limit

Residue: benomyl

<u>Crop(s)</u>	<u>Limit</u> <u>(mg/kg)</u>
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nuts

0.2 ppm

NOTES: