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OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: PP#6E3347, Diazinon in/on Ginseng - Evaluation of Analytical Methods and Residue Data (Accession No. 260870; RCB No. 474).

FROM: E.T. Haeberer, Chemist *E.T. Haeberer*  
Residue Chemistry Branch  
Hazard Evaluation Division (TS-769C)

TO: Hoyt Jamerson, PM 43  
Emergency Response and Minor Use Section  
Registration Division (TS-767C)

and

Toxicology Branch  
Hazard Evaluation Division (TS-769C)

THRU: Robert S. Quick, Head *R.S. Quick*  
Tolerance Pesticide Section I  
Residue Chemistry Branch  
Hazard Evaluation Division (TS-769C)

Interregional Research Project No. 4, on behalf of the IR-4 National Director, Dr. R.H. Kupelian and the Agricultural Experiment Stations of Wisconsin and Kentucky, requests the establishment of a tolerance for the residues of the insecticide O,O-diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl) phosphorothioate in/on the raw agricultural commodity ginseng at 0.75 ppm.

Ciba-Geigy Corporation has submitted a letter (Carolyn F. Brinkley, Regulatory Specialist, Ciba-Geigy Corp.) to Hoyt Jamerson (Minor Uses Officer, EPA) authorizing the use of all Diazinon data, submitted by Ciba-Geigy Corp. to EPA, which are necessary to support the IR-4 request to establish tolerances in/on the raw agricultural commodity, ginseng.

RCB recommended for a Section 18 emergency exemption for the use of Diazinon on ginseng, requested by the Wisconsin Department of Agriculture (memorandum April 10, 1984, Sami Malak).

Permanent tolerances have been granted for Diazinon (40 CFR 180.153) on beet roots (0.75 ppm), carrots (0.75 ppm), parsnips (0.5 ppm), rutabagas (0.75 ppm), radishes (0.5 ppm), sugarbeets roots (0.5 ppm), turnip roots (0.5 ppm).

### Conclusions

1. The nature of the residue in plants is understood. The residue of concern in this petition is the parent compound.
2. Adequate analytical methodology is available for enforcement of the proposed tolerance for Diazinon.
- 3a. No residue data have been submitted reflecting the proposed use of Diazinon on ginseng.
- 3b. The petitioner requests that a tolerance of 0.75 ppm be extended to ginseng, stating the use would be similar to that for other root crops with established tolerances. RCB disagrees with this supposition for the following reasons:
  - (1) Ginseng requires five to seven years to grow to maturity as compared to one season for the comparative root crops.
  - (2) There are no residue data which reflect multiple applications of Diazinon on a root crop at the proposed preharvest interval (PHI). There are insufficient data for the purpose of extrapolation.
- 3c. For the reasons cited above, we can draw no conclusions concerning the adequacy of the requested tolerance for the proposed multiple application use. Additional residue data are needed which reflect the maximum proposed use pattern and appropriate PHI.
- 3d. We could recommend in favor of the requested tolerance if the proposed use was changed to one application per year. The petitioner would have to submit a revised Section B with the appropriate changes.

- 4a. The petitioner has submitted documents which testify that only the root of the ginseng plant is used and that the leaves are discarded.
- 4b. In the submission for the Section 18 emergency exemption use (memorandum April 10, 1984, S. Malak) it was specified that the tops of the ginseng plants would be turned under at harvest for mulching.
- 4c. Section B should be amended to restrict use of ginseng plant tops as either an agricultural commodity or forage, fodder, or feed.
5. Since ginseng root is not considered a feed item, we anticipate no secondary residues in meat, milk, poultry, and eggs from this source.
6. The International Tolerance Status Sheet is attached. There are no established tolerances of Diazinon on ginseng in Canada, Mexico or by Codex, therefore there are no compatibility problems.

#### Recommendation

We recommend against establishment of the proposed tolerance for reasons cited in Conclusions 3a, 3b, 3c, 3d, and 4c.

#### Detailed Considerations

##### Manufacture

See Confidential Appendix.

##### Formulation

D.Z.N. Diazinon AG500 is an emulsifiable solution formulated as 48.0% active ingredient (4 lb ai/gal). All inerts used in this formulation are cleared under 40 CFR 180.1001

##### Proposed Use

For control of leafhoppers, aphids, lygus, bugs, flea beetles and jumping plant lice on ginseng, spray 3/4 to 1 pt (0.375 to 0.50 lb ai)/A when insects first appear and repeat

at 7 to 14 day intervals if necessary. For heavy insect infestations use 1 pt (0.50 lb ai) per acre. Apply by ground equipment using 10 to 100 gallons of water per acre. Do not apply more than five times per growing season. Do not apply during flowering of three or four year old crops. Do not apply within 30 days of harvest.

#### Nature of Residue

No new metabolism studies were submitted with this petition. The nature of the residue was discussed extensively in the review of PP#1F1153 (June 6, 1972, D. Reed). Diazinon is a cholinesterase inhibiting insecticide which is absorbed and translocated in plants. Diazinon, per se, is the residue of concern.

#### Analytical Method

Several analytical methods have been used to determine residue levels of Diazinon and are summarized in our review of PP#4E2991 (February 10, 1984, E.T. Haeberer). A brief description of the sulfide method, used in conjunction with PP#198 to generate residue data on carrots, follows:

Diazinon is extracted from the sample with solvent and partitioned from the solvent with 48% hydrobromic acid. Upon boiling the acid solution, the Diazinon sulfur is converted to hydrogen sulfide and collected in zinc acetate solution. The sulfide is determined spectrophotometrically as methylene blue. The advantages of this method are that it is easily run, extremely sensitive and the color produced is stable for hours. The method is subject to interference from thiocarbamates and crops with high thiol content such as cole crops.

Recoveries for carrots fortified at 0.250 to 1.000 ppm ranged from 92.0 to 111.0 percent, MDL 0.05 ppm.

Adequate analytical methods are available in the Pesticide Analytical Manual for enforcement of the proposed tolerance.

#### Residue Data

No residue data were submitted with this current petition. The petitioner referred to previously established tolerances for Diazinon in root crops, i.e., carrots 0.75 ppm, parsnips 0.50 ppm, radishes 0.50 ppm, turnip roots 0.50 ppm (PP#198,

all with 10-day PHI's), sugar beet roots 0.50 ppm (PP#362, no PHI). Data submitted for these crops do not reflect multiple applications and the appropriate PHI. In addition, with the exception of carrots, the tolerances are set for 0.50 ppm. Finally, these root crops are raised in a single growing season, while ginseng root requires five to seven years to reach maturation.

Residue data on carrots reflecting a single application of 0.25 lb ai/A showed residue levels at 0.81, 0.54 and  $\leq 0.16$  ppm for 0, 1, and 7 to 14 day PHI's. Carrots treated with a single application of 0.5 lb ai/A yielded residues of 1.14, 0.84, and 0.01 ppm at 3, 7, and 14 day PHI's. Turnips treated with 0.50 lb ai/A reflected residues in the root of 0.49, 0.43, and 0.29 ppm at 0, 7, and 14 day PHI's after a single application.

From the above data we can conclude that the proposed tolerance of 0.75 ppm on ginseng would be adequate for a single application per season, at the proposed application rate and PHI. We can draw no conclusion concerning the

adequacy of the proposed tolerance for five applications/season over a period of five to 7 years.

#### Meat, Milk, Poultry, and Eggs

Since ginseng root is not a feed item we do not anticipate secondary residues in meat, milk, poultry, and eggs from the proposed use. The petitioner should, however, revise Section B to restrict grazing in treated fields and use of plant tops as forage, fodder, or feed.

#### Other Considerations

The International Tolerance Status Sheet is attached. There are no established tolerances of Diazinon on ginseng in Canada, Mexico, or by Codex, therefore there are no compatibility problems.

Attachment 1: Codex Sheet

Attachment 2: Confidential Appendix (Attached copy to TOX, RD, PM, RF, PMSD/ISB, E. Haeberer, PP#6E3347 copy only)

cc: R.F., Circu, Reviewer, TOX, EAB, EBB, PP#6E3347, FDA, PMSD/ISB, F. Boyd

TS-769:RCB:E.Haeberer:Edited by vg:CM#2:Rm810:77484:3/28/86  
RDI: R. Quick, 3/19/86; R. Schmitt, 3/20/86

87775:Haeberer:C.Disk:KENCO:3/26/86:SONJA:

Attachment 1

INTERNATIONAL RESIDUE LIMIT STATUS

CHEMICAL Diazinon

PETITION NO. PP#6E3347

CCPR NO. 22

Proposed U.S. Tolerances

Codex Status

No Codex Proposal  
Step 6 or above

Residue (if Step 9): \_\_\_\_\_  
Parent

Residue: Diazinon; O,O-  
diethyl O-(2-isopropyl-  
6-methyl-4-pyrimidinyl)  
phosphorothioate

Crop(s) Limit (mg/kg)  
None (on Ginseng)

Crop(s) Tol. (ppm)  
Ginseng 0.75

CANADIAN LIMIT

MEXICAN TOLERANCIA

Residue: \_\_\_\_\_  
\_\_\_\_\_

Residue: \_\_\_\_\_  
\_\_\_\_\_

Crop Limit (ppm)  
None (on Ginseng)

Crop Tolerancia (ppm)  
None (on Ginseng)

Notes:

Attachment 2

Confidential Appendix to PP#6E3347

Manufacture

A complete review of the revised manufacturing process for technical Diazinon is provided in the memorandum of November 28, 1983 from W.L. Anthony, RCB, HED, to G. LaRocca, IRB, RCB. The concentration of active ingredient by the new process is the same as in the old product. A residue problem is not expected from the low level impurities in the revised manufacturing product.

CONFIDENTIAL APPENDIX  
to RCB Science Review No. 474  
(Contains FIFRA Trade Secret/CBI Information)