

7/23/79

PP#9F2205. BAS 352F in or on strawberries. Evaluation of analytical methodology and residue data.

M. Nelson, Chemist, RCB, HED (TS-769)

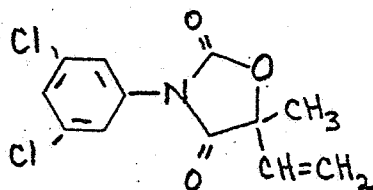
P. M. Team 21 (H. Jacoby), FHB, RD (TS-767) and TOX, HED (TS-769)

Chief, RCB

BASF Wyandotte Corporation proposes that a tolerance be established for residues of the fungicide 3-(3,5-dichlorophenyl)-5-ethenyl-5-methyl-2,4-oxazolidinedione (aka BAS 352F, vinclozolin (ISO prop.), RonilanTM) and its dichloroaniline-containing metabolites in or on the raw agricultural commodity strawberries at 10 ppm.

BAS 352F is a new pesticide. There are no permanent tolerances established. There has been one previous submission (PP#CG2063), and that proposed a temporary tolerance at 5 ppm on this same r.a.c., strawberries; it received our (G. Makhijani, 1/19/79 review) favorable recommendation. The tolerance went into effect 3/2/79.

BAS 352F:



Conclusions

1. [REDACTED] does not appear to be a cleared inert. The petitioner is requested to clarify this. Should this inert not be presently cleared, the petitioner will need to either secure such clearance from this Agency or substitute a suitable alternate.
- 2a. The nature of the residue in strawberries is adequately understood. The parent compound and the 3,5-dichloroaniline moiety-containing metabolites are the components of concern.
- 2b. For purposes of this petition--in which no animal feed item is involved--we consider the nature of the residue in animals to be adequately delineated as well.
3. Adequate analytical methodology appears to be available to enforce the proposed tolerance. This conclusion is subject to verification by MTO by EPA chemists.
4. The residue data support that the proposed tolerance level is adequate and appropriate in conjunction with the proposed use.

INERT INGREDIENT INFORMATION IS NOT INCLUDED

5. No animal feed item is involved. There is thus no reasonable expectation of residues in meat, milk, poultry, or eggs.

Recommendations

We recommend against the establishment of the proposed tolerance pending resolution of the apparent deficiency cited in Conclusion 1.

The TOX and EFB reviews have not been received in RCB to date.

An MTO is being requested of CBIB, BFSD.

P.M. Note: if and when this tolerance is established, it should be expressed in the more specific terms of parent and its 3,5-dichloroaniline metabolites rather than the broader term, dichloroaniline metabolites. (No residues of other than the 3,5- metabolites have been found; the methodology would probably detect other isomers, if they existed, as separate peaks, thus it is more feasible to be specific re the tolerance expression).

Detailed Considerations

Manufacture and Formulation

The schema for the manufacturing process of technical BAS 352F is appended as Attachment 1.

A listing of the impurities in the technical product is appended as Attachment 2. None of these is expected to present a residue problem at the levels present.

The technical product is formulated in Germany as a 50% wettable powder under the trade name "Ronilan" Fungicide (50 W). The confidential statement of formula is appended as Attachment 3.

All the inerts are cleared for use under 40 CFR 130.1001(c), with the apparent exception of [REDACTED]. We are advised by J. A. Shaughnessy, RD (telecon, 7/12/79) that RD records do not indicate this to be an exempted inert. However, our previous review (G. Makhijani, 1/19/79) of PP#8G2063 in which this same formulation was employed, states that all the inerts are cleared. In view of this discrepancy, we request additional clarification from the petitioner; i.e., does the petitioner claim this is a cleared inert and, if so, under what subsection of 130.1001 and listed by what precise nomenclature. Should this inert not be presently cleared, the petitioner will need to either secure such clearance from this Agency or substitute a suitable alternate.

INERT INGREDIENT INFORMATION IS NOT INCLUDED

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Proposed Use

Ronilan is a contact fungicide used to control botrytis fruit rot on strawberries. The rate used depends upon the foliage density of the strawberry beds to be treated, and varies from 1-2 pounds of product (0.5-1 lb ai) per acre (broadcast basis) applied in at least 100 gallons of water. To achieve thorough coverage of the developing fruit, use high pressure (60-150 psi) ground type, spray boom equipment to obtain adequate penetration of the spray through the canopy.

Applications are to begin during the early bloom period (not later than 10% primary bloom) and continue at frequent intervals until fruit is picked or disease incidence drops to an economically insignificant level. In practice, applications may be made every 3-5 days in Florida (winter production), but in all areas except Florida, every 7-9 days to 10-14 days depending upon weather conditions, the degree of irrigation, and disease pressure.

There is no limitation with respect to last treatment-to-harvest interval.

Ronilan is stated to be compatible with most fungicides commonly used for anthracnose or leaf scorch such as captan or benomyl. There is no specific indication⁶ the labeling that tank mixing is being recommended (in contrast to the earlier EUP label).

Restrictions: do not apply more than a total of 35 lbs of Ronilan (17.5 lbs ai) per acre in one season.

Nature of the Residue

Reports of studies of the metabolism of BAS 352F using ¹⁴C uniformly ring-labeled compound in fruit (strawberries and grapes), animals (rats), and soil were previously submitted with PP#8G2068, and were extensively discussed in our (G. Makhijani, 1/19/79) review thereof, which see. A schema of the metabolic pathway based on these studies is appended hereto (Attachment 4) for convenience.

No new studies on the metabolism of BAS 352F in strawberries have been submitted. Additional metabolism studies with lettuce and stone fruit (peaches) are to be found in PP#9G2204, which is awaiting review. (Note: in addition to the previously reported plant degradates, metabolite F was detected; heretofore it had only been identified in rat excreta).

To highlight the earlier findings, the principal metabolites found in strawberries are (refer to attachment 5 for designations and structures) metabolites B and T, with the end detectable metabolite being the conjugated (probably to glucose or pectin) Metabolite D (3,5-dichloroaniline). The overall degradation of BAS 352F in the rat is similar, but the major metabolite was found to be a trihydroxybutanoic acid designated as Metabolite F; Metabolite F also degrades to the endproduct Metabolite D.

We conclude that the nature of the residue in strawberries is adequately understood. The parent compound and the 3,5-dichloroaniline moiety-containing metabolites are the components of concern. For purposes of this petition--in which no animal feed item is involved--we consider the nature of the residue in animals to be adequately delineated as well. (Note: a large animal (lactating ruminant) metabolism study will be needed to support a proposed tolerance if/when an animal feed use becomes involved in future petition(s).)

Analytical Methodology

Residue data in both this petition and the previous PP#8G2068 were obtained using the petitioner's Analytical Method No. 25, 11/21/77, which determines residues of BAS 352F and its 3,5-dichloroaniline containing metabolites.

Briefly, strawberries are subjected to alkaline hydrolysis to form free 3,5-dichloroaniline, which is quantitatively isolated by steam distillation. Following clean-up by liquid-liquid partitioning and derivatization, final determination is based on EC-GLC detection of the acylated 3,5-dichloroaniline. The total residue found is expressed in terms of BAS 352F equivalents. The method is sensitive to 0.05 ppm.

Confirmatory procedures are available in the form of an alternate GLC column and/or use of a N-specific electrolytic conductivity detector, if needed.

Validation data was submitted for strawberries fortified prior to alkaline hydrolysis with BAS 352F (0.05-20 ppm) or Metabolites B, D, or E (0.5-5 ppm). Recoveries were adequate (ranging 60-130% and averaging ca 90%) in all cases. Control values were generally at or below the level of method sensitivity (0.05 ppm). Sample chromatograms were submitted.

A specificity study was conducted with this methodology to determine whether any of the 59 compounds registered for use on strawberries would interfere. Only chlordane (presently under EPA suspension) was found to interfere with the basic method, and even this interference could be eliminated by switching to an electrolytic conductivity detector.

We conclude that this methodology appears adequate for residue data gathering purposes. We tentatively conclude this methodology is also suitable for enforcement purposes; this is subject to verification by an MTO to be conducted by EPA chemists.

Residue Data

Storage Stability. Partial results of a freezer storage stability study (still in progress) for BAS 352F and its 3,5-dichloroaniline-containing metabolites B, D, and E in strawberries (and soil) have been submitted. Strawberries were fortified at levels of 0.2 or 5 ppm of each compound, and samples removed from storage for analysis at intervals up to 19 months (a 24-month interval sample remains to be collected to complete the study). Recoveries averaged $88 \pm 11\%$ for parent compound and $94 \pm 15\%$ for the metabolites.

Field Studies. The residue data from the 1977 crop year studies with strawberries (CA, FL, MS, OR, TN) was submitted earlier with PP#8G2068 and was discussed in our (G. Makhijani, 1/19/79) review thereof. That discussion, which see, is incorporated into this review by reference. Therein we concluded that the then available data supported a temporary tolerance of 5 ppm; the proposed use was essentially the same as currently (except in this petition there is a limitation on the total amount of product which can be applied per acre per season and, herein, tank-mixing is not specifically advocated).

Additional field data, from the 1978 crop season, is submitted with this petition. It consists of data from FL and CA. Strawberry plots in FL received a total of 21 consecutive 0.75 lb ai/A (= 3/4X maximum permitted) treatments on a 3 to 7 day application schedule. The strawberries were sampled before and after each application, beginning with the fifth application. Interval between treatment-to-sampling (TSI) ranged from 0-7 days after application. Residue values ranged from 0.47-6.64 ppm BAS 352F equivalents, depending mainly on the TSI and, to a lesser extent, on the number of applications and the interval between applications.

Strawberry plots in CA received a total of 24 applications at a rate of 0.25-2 lbs ai/A (up to 2X the maximum recommended) each. Twelve of the applications were applied in 1977, followed by 12 applications in 1978. The residue data obtained from the 1977 portion of the trials ranged from 0.16 ppm to 7.8 ppm (2X rate; maximum residue for 1X rate = 3.47 ppm) BAS 352F equivalents, depending on treatment rate, interval between treatments, and the TSI. The samples from the 1978 portion of the trial were taken 0-7 days after the 18th and 24th application (6th and 12th 1978 application). Residue values ranged from 0.48-6.89 ppm (2X rate; maximum residue at 1X rate = 3.66 ppm) BAS 352F, depending on the same factors as stated above. There appears to be very little difference in the residue data obtained from strawberries treated only in 1977 and those receiving an equivalent number of applications in both 1977 and 1978. A significant build-up of residues after continued multiple applications was not demonstrated.

Based on the proposed use patterns and the available residue data at hand, we conclude that the proposed 10 ppm tolerance level is adequate. We also consider this level to be appropriate in view of the higher residues being encountered in FL (due to the shorter between-treatment-interval permitted there via the proposed use directions).

Since the labeling does not specify directions for tank-mixing (unlike the labeling for the EUP/temporary tolerance), we do not require residue data for compatible pesticides be submitted with this petition.

Residues in Meat, Milk Poultry and Eggs

No animal or poultry feed item is involved in this petition.

There is thus no reasonable likelihood of secondary residues of BAS 352F or its metabolites in meat, milk, poultry, or eggs.

M. Nelson

Attachments-5

TS-769:RCB:CM#2:MJNELSON:sdb:X77484:RM810:7/23/79

cc: EEE, TOX, CHM (3)

RDI:RSQUICK:7/23/79:JGCUMMINGS:7/23/79

VINCLOZOLIN

Page _____ is not included in this copy.

Pages 7 through 8 are not included.

The material not included contains the following type of information:

- ☐ Identity of product inert ingredients.
- ☐ Identity of product impurities.
- ☒ Description of the product manufacturing process.
- ☐ Description of quality control procedures.
- ☐ Identity of the source of product ingredients.
- ☐ Sales or other commercial/financial information.
- ☐ A draft product label.
- ☐ The product confidential statement of formula.
- ☐ Information about a pending registration action.
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