1-27-84

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

JAN 27 1984

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

NOTICE TO THE READER:

NOTICE TO THE READER:

IN THE FOLLOWING REVIEW, WHENEVER THE WORD "COFFEE" IS USED, THE READER SHOULD READ "COFFEE (ACCESSION NUMBER #071770)".
"COTTON" SHOULD BE READ AS "COTTON (ACCESSION NUMBER #071771)" AND
"SUGARCANE" SHOULD BE READ AS "SUGARCANE (ACCESSION NUMBER #071772)".

Subject: ACCESSION NUMBER = 071770 COFFEE
ACCESSION NUMBER = 071771 COTTON
ACCESSION NUMBER = 071772 SUGARCANE
PP3F2938. BAYLETON on Cotton, Coffee, Sugarcane.
Evaluation of Analytical Method and Residue Data.

To: H. Jacoby, PM 21
Registration Division (TS-767)

and

Toxicology Branch
Hazard Evaluation Division (TS-769)

Thru: Charles L. Trichilo, Branch Chief
Residue Chemistry Branch (TS-769)

From: Russell W. Cook, Chemist
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

The petitioner, Chemagro Agricultural Division of Mobay Chemical Corp., propose establishment of tolerances for residues of the fungicide 1-(4-chlorophenoxy)-3,3-dimethyl-1(1H-1,2,4-triazol-1-yl)-2-butanone in or on the raw agricultural commodities cottonseed at 0.2 ppm, coffee beans at 0.05 ppm, and sugarcane at 0.1 ppm. The fungicide is tradenamed BAYLETON® and has also been designated BAY MEB 6447. The BSI and ISO name triadimefon has been used in Codex considerations. Tolerances for residues of this chemical have been established recently under 40 CFR 180.410 at various levels ranging from 0.04 ppm to 145 ppm.

Section F merely lists commodities and proposed tolerance level, without indication of specific chemicals to be covered by tolerance. Section G, Reasonable Grounds, however, specifically mentions both the parent compound and its metabolite beta-(4-chlorophenoxy)-alpha-(1,1-dimethylethyl)-1H-1,2,4-triazol-1-ethanol (known by the BSI and ISO name triadimenol and trivially as KWG0519). RCB has previously recommended (A. Smith, 9/9/82, PP2F2665) that the tolerance be expressed in terms of parent and its metabolites containing chlorophenoxy and triazole moieties. The petitioner should submit an amended Section F specifying the residue to be covered by the proposed tolerances.

The petitioner's letter does not mention that the proposed tolerances are intended to cover Bayleton® residues in coffee beans imported from Brazil, in imported sugarcane (presumably from Mexico, based upon location of residue trials), and in imported cotton (as above, presumably Mexico). See p.1 of "Synopsis" in above accessed documents, and last paragraph of Section G.

Conclusions:

1. We have previously concluded that the metabolism of Bayleton® in plants and animals is adequately understood. The residue of concern in plants is the parent compound and its free and conjugated metabolites KWG 0519 [beta-(4-chlorophenoxy)-alpha-(1,1-dimethylethyl)-1H-1,2,4-triazol-1-ethanol], and KWG 1342 (Bayleton® diol). In animals the residue of concern is the parent compound and its free and conjugated metabolites KWG 0519, KWG 1342, and KWG 1323 (hydroxylated Bayleton).

2. An adequate enforcement method is available.

3a. We can draw no conclusion as to whether or not residues of Bayleton® and its metabolites are likely to exceed the proposed 0.2 ppm tolerance in or on cottonseed, the proposed 0.05 ppm tolerance in or on coffee beans, or the proposed 0.1 ppm tolerance in or on sugarcane until the questions of 1) what countries use is intended in and 2) sufficient numbers of studies from those countries, are submitted (see also conclusions 8 and 9).

3b. Residues of Bayleton® and its metabolites in cottonseed processing fractions and sugarcane processing fractions are not likely to exceed the residue levels in the raw agricultural commodities cottonseed and sugarcane, respectively.

3c. No residue data are available for the raw agricultural commodity sugarcane forage and fodder. If and when the petitioner proposes use within the U.S., data on these will be required.

4a. Secondary residues in meat, milk, poultry and eggs resulting from the feeding of the byproducts of sugarcane and cottonseed processing will be adequately covered by existing tolerances.

4b. Since coffee beans are imported as dry, green beans and roasted in the U.S., no animal feed items would be available within the U.S. and no reasonable expectation of secondary residues in meat, milk, poultry and eggs from this source.

5. There are no data for beverage coffee. However, calculated maximum residues in beverage coffee would be much less than the proposed tolerance.

6. An amended Section F expressing the residue to be covered by the proposed tolerances is needed. We have previously concluded the tolerance should be expressed in terms of parent compound and its metabolites containing the chlorophenoxy and triazole moieties.

INERT INGREDIENT INFORMATION IS NOT INCLUDED

7. The chemical identity of [redacted] should be submitted for review, to determine if this material is cleared under 40 CFR 180.1001. Alternately, this material should be removed from the formulation.

8. The petitioner should provide evidence that countries in which the subject commodities are grown have regulatory controls and further, that registration in those countries has been granted or application for registration has been made.
9. The petitioner should provide further information in regard to the importation of raw sugarcane and raw unginned cotton into the U.S. We are not aware that these materials are international trade items. If, in fact, it is ginned baled cotton imported to the U.S., there should be no cottonseed available within the U.S. and therefore no need to establish any rac tolerances. If the imported material is sugar, in any form other than raw cane, then there is no need to establish any rac commodity tolerance. Depending upon the nature of the commodity actually imported to the U.S., it may be more appropriate to propose food additive tolerances for residues of BAYLETON® in or on sugar and molasses or cottonseed oil and soapstock.

10. The petitioner should correct the proposed application rate for coffee to specify a maximum of 28.6 ounces or 2000 grams of formulated product per crop season.

11. The petitioner should be aware that if and when use of BAYLETON® within the U.S. is proposed, additional residue data for principal US growing regions will be required.

    For sugarcane, residue data from Louisiana or Florida and Hawaii would be appropriate. Further, data on sugarcane forage and fodder may be required, and a tolerance may be needed. Alternatively, a practical label restriction against the use of sugarcane forage and fodder as animal feed should be proposed. Residue data for bagasse may also be needed.

    For cotton, major growing regions should be represented. If this data indicate that tolerances higher than those proposed herein are required, such higher tolerances should be proposed. Further, if higher tolerances are required, new sugarcane and cottonseed processing studies may be needed.

12. An International Residue Limit Status sheet is attached. For coffee beans, the petitioner has requested a 0.05 ppm tolerance and Codex limits for triadimefon residues (presumably including its metabolite triadimenol) are established at 0.1 mg/kg. The U.S. tolerances are being established in terms of parent and metabolites containing the chlorophenoxy and triazole moieties. We are unable to resolve the incompatibility. There are no Canadian, Mexican or Codex tolerances for cotton seed or sugarcane and no problems of incompatibility can be anticipated at this time.

13. We believe that this petition was incorrectly filed as a "F" petition, whereas it should have been filed as an "E" (import tolerance) petition.

Recommendations:

We recommend against the proposed tolerance because of Conclusions 3a, 6, 7, 8, 9 and 10. For a favorable recommendation, the petitioner should be advised of the following:

1. An amended Section F specifying the tolerable residue in terms of parent compound and its chlorophenoxy and triazole moieties is needed.

2. The inert ingredient [redacted] must be cleared under 40 CFR 180.1001, or removed from the formulation. INERT INGREDIENT INFORMATION IS NOT INCLUDED

3. Evidence should be provided showing that countries in which the subject commodities are grown have regulatory controls and further, that registration in those countries has been granted or application for registration has been made.

4. The petitioner should provide information regarding the importation of raw sugarcane and unginned cotton into the U.S. We are not aware that these materials are international trade items. If in fact it is ginned baled cotton imported to the U.S., there should be no cottonseed available within the U.S. and therefore no need to establish any rac tolerances. If the imported material is sugar, in any form other than raw cane, then there may be no need to establish any rac commodity tolerance. Depending upon the nature of the commodity actually imported to the U.S., it may be more appropriate to propose food additive tolerances for residues of BAYLETON® in or on sugar and molasses, or cottonseed oil and soapstock.

5. When the questions raised in question 4 above are resolved and sufficient numbers of residue studies are submitted from those countries, we will be able to draw conclusions on the adequacy of the proposed tolerances.

6. The petitioner should correct the proposed application rate for coffee to specify a maximum of 28.6 ounces or 2000 grams of formulated product per crop season.

7. The petitioner should be aware that if and when use of BAYLETON® within the U.S. is proposed, additional residue data for principal US growing regions will be required.

   For sugarcane, residue data from Louisiana or Florida and Hawaii would be appropriate. Further, data on sugarcane forage and fodder may be required, and a tolerance may be needed. Alternatively, a practical label restriction against the use of sugarcane forage and fodder as animal feed should be proposed. Residue data for bagasse may also be needed.

   For cotton, major growing regions should be represented. If this data indicate that tolerances higher than those proposed herein are required, such higher tolerances should be proposed. Further, if higher tolerances are required, new sugarcane and cottonseed processing studies may be needed.

Notes to the PM:

We believe that this petition was incorrectly filed as a "F" petition, whereas it should have been filed as an "E" (import tolerance) petition.

We note in Section G that the petitioner lists the tolerance on eggs as 0.002 ppm. Our records indicate the established tolerance is 0.04 ppm. We suggest the petitioner be advised of this error.

INERT INGREDIENT INFORMATION IS NOT INCLUDED

DETAILED CONSIDERATIONS:

Formulation and Manufacture:

The formulation proposed for use is Bayleton 25% Wettable Powder a formulation containing 25% of the active ingredient and registered under EPA Reg. No. 3125-318. The inert ingredients consist of [redacted] The inert ingredients, except [redacted], are cleared under 40 CFR 180.1001 for application to growing raw agricultural commodities. The chemical identity of [redacted] should be submitted for our review, to determine if this material is cleared under 40 CFR 180.1001, or removed from the formulation.

The manufacturing process for the technical material was discussed in our review of PP 2F2665 (A. Smith, 9/9/82). No residue problems are anticipated from the impurities.

Proposed Use:

For control of various diseases on cotton, coffee, and sugarcane, apply BAYLETON® 25% Wettable Powdwer as below:

Coffee:
Apply 14.3 ounces (3.55 oz. a.i.) per acre of BAYLETON® 25% WP (250 grams a.i./ha.) in sufficient spray solution for complete coverage to the point of drip. A maximum of 2 applications may be may up to 7 days of harvest. A maximum of 28.6 ounces per acre (1000 grams form. product/ha.) may be applied per crop season. Note: We believe that 28.6 ounces per acre is 2000 grams/ha. per growing season.

Cotton:
Apply 3.6 ounces (0.9 oz. a.i.) per acre of BAYLETON® 25% WP (62 grams a.i./ha.) in sufficient spray solution for complete coverage to the point of drip. Maximum of 2 applications may be made up to 61 days of harvest and maximum of 7.2 oz. per acre may be applied per crop season.

Sugarcane: At Planting:
Apply 14.3 ounces (3.55 oz. a.i.) per acre of BAYLETON® 25% WP (250 grams a.i./ha.) in 32 gal. (300 l./ha.) of water and apply as a soil spray in a 5 inch band and incorporate.

Sugarcane: Foliar Application:
Apply 1.8 lb. (0.45 lb. a.i.) per acre of BAYLETON® 25% WP (500 gram/ha.). Apply specified dosage in 32 gals. (300 l./ha.) as a foliar spray. Up to 3 applications can be made per season, but do not make application intervals any closer than 30 days. Applications can be made up to 60 days of harvest. Do not apply foliar treatments if an at planting applications was made.

The petitioner should correct proposed application rate for coffee to specify a maximum of 28.6 oz./A or 2000 gram/ha. of BAYLETON® 25% WP per crop season.

Nature of the Residue:

The metabolism of Bayleton® in apples, cucumbers, and tomatoes is discussed in PP0G2300, PP2F2349, and in wheat (PP2F2665, 9/9/82, A. Smith). In plants the residue consists of the parent compound and its metabolite beta-(4-chlorophenoxy)-

alpha-(1,1-dimethylethyl)1H-1,2,4-triazol-1-ethanol (KWG 0519), and KWG 1342 (Bayleton diol). The residue of concern in animals consist of the above three compounds plus KWG 1323 (hydroxylated Bayleton). Since these materials are found in both free and conjugated forms, we have recommeded the tolerance be expressed in terms of parent and its metabolites containing the chlorophenoxy and triazole moieties. The petitioner should propose the tolerance in these terms.

Analytical Methods:

The analytical method, marked "Not Confidential", for residues of BAYLETON® and its metabolites KWG 0519, KWG 1342, and KWG 1323 is entitiled "Residue Analysis Procedure for ®BAYLETON and Metabolites in Barley and Wheat", Report No. 80488.

In brief, residues of Bayleton®, KWG 0519, KWG 1342, and KWG 1323 are extracted from plant substrates by blending with methanol/ water, and refluxed to release additional materials. Enzymatic hydrolysis with cellulase extracts conjugated materials. Florisil columns are used to cleanup the extract. KWG 1323 is alternatively cleaned on a gel permeation column. The parent and KWG 0519 are gas chromatographed using nitrogen-specific alkali flame detector. KWG 1342 and KWG 1323 are first derivatized with trifluoroacetic anhydride prior to gas chromatography. Coffee beans were subjected to additional benzene/water partition after derivatization. Residues of KWG 0519, KWG 1342, and KWG 1323 are reported in terms of BAYLETON® equivalents as calculated by molecular weight factors of 0.99, 0.94, and 0.95, respectively.

Untreated control samples of dry coffee beans all contained <0.01 ppm of Bayleton® and KWG 0519. Recovery values at 0.05 ppm fortification level ranged 70% to 98%. In cottonseed and cottonseed fractions, untreated control samples contained <0.01 ppm - 0.02 of Bayleton®, KWG 0519, and KWG 1342 (except 0.04 ppm in hulls). Recovery values at 0.05 ppm fortification level ranged 70% to 106% in these substrates. For sugarcane and sugarcane fractions, untreated control samples contained <0.01 ppm - 0.02 ppm of Bayleton®, KWG 0519, and KWG 1342 (except 0.06 ppm in bagasse). Recovery values at 0.05 - 1.0 ppm fortification levels ranged 70% to 106%.

The method is similar to the method successfully tried in our laboratories (PP 2F2665, 12/16/82, A. Smith). For this reason, we conclude that adequate methods are available for enforcement purposes.

Residue Data:

Coffee:

Four trials in four Brazilian locations are available. In all trials, coffee plants were treated at 3.57 ounces a.i./A with 2 or 4 applications. Fully ripe coffee beans were sundried for 20 days. Coffee bean samples were taken at 1 to 15 days after last treatment in the 2 application program and at 14 - 29 days in the 4 application program. Only 3 samples (at 6, 7, 8, and 8 days) reflect the were <0.01 to 0.01 ppm, and KWG 1342 was <0.01 ppm. Maximum residue detected at any interval after 2 treatment program was 0.02 ppm of KWG 0519 at 1 day. Residues of parent per se after 4 treatments was 0.01 and 0.02 ppm at 14 and 28 days. The metabolite KWG 0519 showed residues levels of <0.1 to 0.04 ppm, while KWG 1342 was <0.01 ppm. Total combined residues of parent and KWG 0519 were 0.05 ppm when 4 treatments were applied.

Coffee Beverage:

There are no data for roasted coffee beans, beverage coffee, or instant coffee. Assuming that the proposed tolerance is adequate and 1) 5 grams of coffee beans per 250 ml. of beverage, 2) all residues present survive the roasting process, and 3) all residues transfer to the brewed beverage, then at most 5 g. X 0.05 microgram/gram = 0.25 micrograms per 250 ml. or 0.001 ppm in brewed beverage. In recognition of the facts that instant coffee powder is reconstituted to the beverage and losses of residues during roasting, extraction and drying make concentration of residues in instant coffee powder unlikely, data for instant coffee powder are not required. Residues in brewed coffee will be much less than in the raw commodity.

Cottonseed:

For cottonseed, four trials at two locations in Mexico are available. Cotton plants having most blossoms in bud were treated with 2 foliar applications of 0.250 kg/ha and samples of seeds were obtained 61 days after last application. Total combined residues ranged 0.03 to 0.09 ppm, with parent compound in slightly greater amounts than its metabolite KWG 0519. Residues of KWG 1342 were <0.01 ppm in all cases.

Cottonseed Processing Fractions:

Mexican cottonseed containing 0.06 ppm parent and 0.05 ppm KWG 0519 were fractionated into hulls, meal, crude oil, refined oil, deodorized refined oil and soapstock. Except for 0.01 ppm in crude oil, all fractions showed less than detectable residues (<0.01 ppm). Residues do not concentrate in cottonseed byproducts and feed additive tolerances are not required.

Sugarcane:

For sugarcane, the submitted information includes 4 trials in 3 locations in Mexico for both at-planting and foliar applications. The at-planting application was 0.25 kg a.i/ha, applied as 5 inch band to soil and incorporated. Samples were taken at 274 to 280 days PHI. The 3 foliar treatments were 0.5 kg a.i./ha., with 53 to 61 day PHI. Untreated sugarcane control values were <0.01 ppm for all three analyzed chemicals. In sugarcane treated at-planting, residues of parent were <0.01 ppm in all samples, as was KWG 1342. Levels of KWG 0519 ranged from 0.04 to 0.07 ppm at 274+ days PHI. Sugarcane treated by foliar application showed residues of parent were <0.01 to 0.02 ppm in all samples, while KWG 1342 was <0.01 ppm. Levels of the metabolite KWG 0519 ranged from 0.03 to 0.06 ppm at 53 - 61 days PHI.

Sugarcane Processing Fractions

In addition, Louisiana sugarcane was aerially treated 2 times post emergence with 0.3 kg a.i./ha. (0.6 X) and sugarcane samples for processing were taken at 124 days (proposed PHI = 60 days) after last application. Raw sugarcane containing 0.02 ppm of parent and <0.01 ppm each of KWG 0519 and KWG 1342 was processed. Unfinished juice, clarified juice, and sugar all showed <0.01 ppm of parent, KWG 0519 and KWG 1342. Molasses, syrup, mud and bagasse showed the same levels of residues as raw cane, 0.02 to 0.03 ppm. We have recently recommended for establishment of tolerances for triadimefon residues in sugar beet tops and roots at 0.5 and 3 ppm, respectively (PP2F2887, A. Smith, 9/12/83, 11/21/83). Sugarbeet

roots containing combined residues of 0.06 ppm were processed into juice, wet pulp, dried pulp, sugar, molasses, and lime cake. All sugarbeet fractions showed no detectable residues (<0.01 ppm). These data on sugar fractions are consistent in both the sugarcane and sugar beet processing studies. Further, residues do not concentrate in refined sugar nor in byproducts of the sugar refining process. Therefore, food additive and feed additive tolerances are not required for sugar or sugarcane byproducts.

When the questions raised concerning the countries where use is intended are resolved and a sufficient number of residue studies are submitted from those countries, we will be able to draw a conclusion on the adequacy of the proposed tolerances for coffee, cottonseed and sugarcane.

Residues in Eggs, Milk, Meat, and Poultry:

Animal feeding studies (cattle and poultry) have previously been reviewed and tolerances for meat, milk, poultry, and eggs have been established. The sugarcane animal feed items of concern are sugarcane forage and fodder, bagasse, and molasses. Cottonseed meal, hulls, and soapstock are used as animal feeds. Although coffee bean hulls are occasionally fed to cattle, the imported commodity is the dry, green bean, without hulls. Therefore, there are no animal feed items available within the U.S., and further, no reasonable expectation of secondary residues in meat, milk, poultry, and eggs from this source.

If and when use within the U.S. is proposed, animal dietary burdens must be recalculated to include sugarcane forage and fodder, and cotton forage. Under the present circumstances, we feel it is not necessary to include these items in our dietary burden calculations.

Since the residue levels contemplated in this petition and the animal dietary ingestion levels of the feed items of concern (sugarcane molasses, cottonseed meal, and soapstock) are considerably less than animal burdens resulting from other established or recommended tolerance levels (for example, wheat and barley grain @ 1 ppm and 50-70% of the animal diet and grain forage tolerances at 15 ppm), we can conclude that secondary residues in meat, milk, poultry, and eggs are not likely to exceed the established tolerances for these commodities.

OTHER CONSIDERATIONS:

International Tolerances:

There are no Codex, Mexican or Canadian tolerances for residues of BAYLETON® on cottonseed or sugarcane.

Codex limits (below Step 6) for BAYLETON® residues (presumably for parent and its metabolite KWG0519) in or on coffee beans are established at 0.1 mg/kg. The petitioner has requested 0.05 ppm tolerance. The U.S. tolerances are being established in terms of parent and metabolites containing the chlorophenoxy and triazole moieties. Therefore, the proposed U.S. tolerance and the Codex limits are not compatible. We are unable to resolve the incompatibility.

Removal of Residues:

The petitioner states that no practical method can be proposed for removing BAYLETON® residues.

TS-769:RCB:RCook:CM#2:Rm810:X77377:1/24/84
cc: RF, Circ., Cook, Thompson, FDA, TOX, EEB, EFB, PP#2F2938
RDI:Section Head:RSQuick:Date:1/25/84:RDSchmitt:1/25/84
Edited by LDT:1/26/84

INTERNATIONAL RESIDUE LIMIT STATUS

CHEMICAL 1-(4-chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone

[BAYLETON®]

CCPR NO. 133

PETITION NO. 3F2938
R. W. Cook
12/8/83

Codex Status

I IV No Codex Proposal Step 6 or above

Residue (if Step 9):

Proposed U.S. Tolerances

Residue: 1-(4-chlorophenoxy)-3,3-dimethyl-1(1H-1,2,4-triazol-1--yl)-2-butanone and its metabolite beta-(4-chloro-phenoxy)-alpha-(1,1-dimethylethyl)-1H-1,2,4-triazol-1-ethanol

Crop(s)	Limit (mg/kg)
Coffee beans	0.1

Crop(s)	Tol. (ppm)
Coffee beans*	0.05
Cottonseed**	0.2
Sugarcane**	0.1

CANADIAN LIMIT

Residue:

Crop	Limit (ppm)
NONE	

MEXICAN TOLERANCIA

Residue:

Crop	Tolerancia (ppm)
NONE	

Comments: * Coffee imported from Brazil
** Cotton and sugarcane imported from Mexico