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

JUL 17 1987

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: PP#6F3419. Bayleton (Triadimefon) Tolerances in or on Rotational Crops. Accession Nos. 263172 and 263173. RCB No. 1062.

FROM: Sami Malak, Ph.D., Chemist
Tolerance Petition Section III
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

THRU: Charles L. Trichilo, Ph.D., Chief
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

TO: Lois Rossi, PM #21
Fungicide-Herbicide Branch
Registration Division (TS-767)

and

Toxicology Branch
Hazard Evaluation Division (TS-769)

Mobay Chemical Corp. proposes amending 40CFR§180.410 by establishing rotational crop tolerances for the combined residues of the fungicide bayleton 1-(4-Chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone and its metabolites containing chlorophenoxy and triazole moieties (expressed as the fungicide) in or on the raw agricultural commodities listed below:

Rotational Crop	Proposed Tolerance (ppm)
Legume vegetables group seed, succulent (including pods) and dry.....	0.05
Foliage of legume vegetables group vines, green.....	1.0
hay.....	0.1

1/22

Corn forage, green	0.1
Corn kernel plus cob with husk removed	0.1
Corn fodder, dry	0.05
Corn kernel, dry	0.01
Cottonseed	0.02
Cotton forage	0.5
Lettuce	0.01
Peanuts (meats)	0.01
Peanut hulls	0.01
Peanut vines (dry)	0.01
Potatoes	0.05
Sorghum, grain	0.01
Sorghum, fodder and forage	0.1

Permanent tolerances are established for the combined residues of bayleton and its metabolites containing chlorophenoxy and triazole moieties in or on several raw agricultural commodities at levels from 0.04 to 145 ppm including a tolerance of 0.1 ppm for the dry seed of chick pea (40CFR§ 180.410). With the exception of the dry seed of chick pea, no tolerances are currently established for residues of bayleton in or on any of the above listed rotational crops. Included in the established tolerances are 15 ppm for the forage of barley and wheat. Tolerances are also established for secondary residues of bayleton at 0.04 ppm for milk; eggs; and the fat, meat, and meat byproducts of hogs and poultry; and at 1.0 ppm for the fat, meat, and, meat byproducts of cattle, goats, horses, and sheep (40CFR §180.410).

Additional tolerances are co-pending on strawberries (PP# 4F3124); tomatoes, tomato catsup, tomato paste, and wet and dry tomato pomace (PP#4F3148/FAP#4H5443); and on imported mangoes (PP#5E3168).

Please note that when and if 40CFR is revised, the tolerance expression for bayleton cited under 40CFR§180.410 which reads (expressed as the fungicide) should be restated to read (expressed as 1-(4-Chlorophenoxy)-3,3-dimethyl-1 (1H-1,2,4-triazol-1-yl)-2-butanone).

The proposed tolerances in this petition, if and when established, will be for the combined residues of bayleton and its metabolites containing chlorophenoxy and triazole moieties in or on the specified rotational crops, where the residues in said commodity result from the uptake of the carryover or residual in soil of these pesticide residues from treatment of previous crops [see 46FR3018, 1/13/81), General Statement of EPA Policy on Tolerance

Setting for Pesticide Residues in Rotational and Follow-Up Crops, Meat, Milk, Poultry, and Eggs, and for Other Indirect or Inadvertent Residues under Sec. 408 (e) of the Federal Food, Drug, and Cosmetic Act.]

The proposed group tolerance for residues of bayleton and its metabolites containing chlorophenoxy and triazole in or on the seed, forage, and hay of legume vegetables group, is reviewed here under the definition appearing in 40CFR§180.34(f) where residue data are required for all of the representative commodities in that group which are: the seed and forage of beans and peas (one succulent variety and one dry variety), and soybeans (40CFR§180.34 (f)(9)(vi)B and §180.34(f)(9)(vii)B.

At present time, there are no tolerances established for residues of baytan, a common metabolite of bayleton. Permanent tolerances are currently pending for residues of the fungicide baytan Beta-(4-chlorophenoxy)-alpha-(1,1-dimethyl-ethyl)-1H-1,2,,4-triazole-1-ethanol, and its metabolite 4-(4-chlorophenoxy)-2,2-dimethyl-4-(1H-1,2,4-triazol-1-yl)-1,3-butanediol in or on wheat grain at 0.75 ppm, wheat green forage at 85 ppm (PP#5F3224/FAP#5H5458, M. Firestone, 5/31/85). Further, RCB has recommended for establishment of proposed tolerances for residues of baytan resulting from seed treatment on cereal grain crops and for secondary residues in animal commodities (PP#3F2854, A. Smith, 1/4/84). Since baytan is a metabolite of bayleton, the tolerances for bayleton and baytan share common residues of concern. Therefore 40CFR§180.3(e) applies. Accordingly if and when bayleton tolerances are established on rotational crops, and if and when tolerances are established for baytan on the same crops (target and/or rotational), 40CFR§180.3(e) will need to be revised by addition of subsection as follows: "When and if tolerances are established for residues of both bayleton and baytan (substitute chemical names here) in or on a raw agricultural commodity, the total amount of such pesticides shall not yield more residue than that permitted by the higher of the two tolerances, calculated as baytan."

The proposed rotational crop tolerances, if and when established, will need to be distinguished in the regulations from other pesticide tolerances which imply a registered (target crop) use [Ref. Rotational Crop Policy Statement, 46FR3018,1/13/81], RCB recommends that a section should be added to 40CFR§180.410 as follows:

(c) Tolerances for indirect or inadvertent residues. Tolerances are established for indirect or inadvertent residues of the fungicide bayleton 1-(4-Chlorophenoxy)-3,3-dimethyl-1(1H-1,2,4-triazol-1-yl)-2-butanone in or on the raw agricultural commodities when present therein as a result of the application to growing crops listed in §180.410(a) as follows:

Commodities	Parts Per Million
Legume vegetables (succulent or dried) group	0.05
Foliage of legume vegetables (succulent only) group	1.0
Foliage of legume vegetables (dried and straw only) group	0.1
Corn, fresh (inc. sweet K + CWHR)	0.1
Corn, grain	0.01
Corn, forage	0.1
Corn, fodder	0.1
Cottonseed	0.02
Cotton, forage	0.5
Lettuce	0.01
Peanuts	0.01
Peanuts, forage	1.0
Peanuts, hay	0.1
Peanuts, hulls	0.01
Potatoes	0.05
Sorghum, grain	0.01
Sorghum, forage	0.1
Sorghum, fodder	0.1

The current tolerances for residues of bayleton in or on target crops listed under 40CFR§180.410 should be properly reclassified into subpart(a)as follows:

§180.410 1-(4-Chlorophenoxy)-3,3-dimethyl-1(1H-1,2,4-triazol-1-yl)-2-butanone; tolerance for residues.
(a) Specific tolerances. Tolerances are, etc."

There is no Registration Standard for bayleton.

Conclusions

1. RCB concludes that the metabolism of bayleton in plants and animals is adequately understood. The residue of concern is the parent compound, bayleton, and its metabolites containing the chlorophenoxy and triazole moieties as expressed in 40CFR§180.410.

2. RCB concludes that adequate analytical methods are available for residue determination of bayleton and its free and conjugated metabolites in/on plant and animal commodities. The method described in this petition (recommended by the EPA on April, 1986 for inclusion in PAM II as Method III), may be used for enforcement of the proposed bayleton tolerances in/on rotational crops. Furthermore, method I or II in PAM II, may be used for enforcement of any bayleton residues that may be incurred in animal commodities resulting from the ingestion of feed items with current tolerances as well as those proposed in this petition for rotational crops.

3. The proposed tolerances in this petition, if and when established, will be for the combined residues of bayleton and its metabolites containing chlorophenoxy and triazole moieties in or on the specified rotational crops, where the residues in said commodity result from the uptake of the carryover or residual in soil of these pesticide residues from treatment of previous crops [see 46FR3018, 1/13/81), General Statement of EPA Policy on Tolerance Setting for Pesticide Residues in Rotational and Follow-Up Crops, Meat, Milk, Poultry, and Eggs, and for Other Indirect or Inadvertent Residues under Sec. 408 (e) of the Federal Food, Drug, and Cosmetic Act.]

4. With a revised Section F [see Conclusion 6(c)] and for all direct uses presently on the registered label except the use on grasses grown for seed, RCB can conclude that the revised rotational crop statement is acceptable.

5. If and when bayleton tolerances are established on rotational crops, and if and when tolerances are established for baytan (a common metabolite of bayleton) on same crops (target and/or rotational), 40CFR§180.3(d) will need to be revised by addition of subsection as follows: "When tolerances are established for residues of both bayleton and baytan (substitute chemical names here) in or on a raw agricultural commodity, the total amount of such pesticides shall not yield more residues than that permitted by the higher of the two tolerances, calculated as baytan."

6(a). Since the test dosage reflects 0.5X the maximum registered dosage of 1 lb act/A on grasses grown for seed, RCB is unable to conclude on the adequacy of the proposed tolerances for residues of bayleton in/on rotational crop commodities. Residue data on

rotational crops are needed following two applications of bayleton, each at 0.5 lb act/A, reflecting the minimum plant back interval (PBI) and PHI's. Alternatively, bayleton rates on grasses grown for seed can be limited to a maximum of 0.5 lb act/A/season.

6(b). With the exception for rotation after grasses grown for seed [see Conclusion 6(a)] and after compliance with revising Section F [see Conclusion 6(c)], RCB can conclude that rotation after other crops on the bayleton labels (#3125-320 and 3125-340), will result in an indirect or inadvertent residues in the rotational crops not exceeding the proposed tolerances for the remaining rotational crop commodities (except peanuts; and peanuts, forage and hay).

6(c). From the submitted data, it is apparent that bayleton residues (also proposed rotational crop tolerances) vary by more than a factor of 5 from residues for other commodities in the legume vegetables and forage of legume vegetables group. For this reason, and to comply with the Section given in 40CFR§180.34(f)(5): "If maximum residues (tolerance) for the representative crops vary by more than a factor of 5 from the maximum value observed for any crop in the group, a group tolerance will ordinarily not be established. In this case, individual crop tolerances, rather than group tolerances, will normally be established" the petitioner is advised to revise Section F and propose tolerances for commodities within the legume vegetables group as follows:

Commodities	Parts Per Million
Legume vegetables (succulent or dried) group	0.05
Foliage of legume vegetables (succulent only) group	1.0
Foliage of legume vegetables (dried and straw only) group	0.1
Corn, fresh (inc. sweet K + CWHR)	0.1
Corn, grain	0.01
Corn, forage	0.1
Corn, fodder	0.1
Cottonseed	0.02
Cotton, forage	0.5
Lettuce	0.01
Peanuts	0.01
Peanuts, forage	1.0

Peanuts, hay	0.1
Peanuts, hulls	0.01
Potatoes	0.05
Sorghum, grain	0.01
Sorghum, forage	0.1
Sorghum, fodder	0.1

7. In the absence of real residues in peanuts used in the processing study, we are unable to conclude if bayleton concentrates in the processed fractions of oil crops. Accordingly, additional processing study is needed in which the seed of an oil crop contains real residues from exaggerated rates of application. Until a processing study is submitted and evaluated, we are unable to recommend for establishment of the requested tolerances for peanuts, and peanut forage, hay and hulls.

8. From the available data and pending compliance with Conclusions 6(a) and 6(c) above, RCB can conclude that the present meat, milk, poultry and egg tolerances will not be exceeded as a result of ingesting feed items from rotational crops cited in this petition as well as commodities from target crops with established tolerances.

9. An International Residue Limit Status Sheet is attached. Canada and Mexico have no established tolerances for bayleton in/on rotational crop commodities cited in this petition. A Codex residue limit of 0.1 ppm is currently established for the sum of triadimefon and triadimenol in/on peas. We do not foresee compatibility between US and Codex tolerances for bayleton due to the differences in the tolerance expression. The US tolerances are expressed as the parent compound, bayleton, plus metabolites containing the chlorophenoxy and triazole moieties, whereas, Codex tolerances are expressed as the parent, bayleton, and hydroxylated bayleton (KWG 1323).

Recommendations

We recommend against the proposed tolerances for residues of bayleton in/on rotational crop commodoties because of Conclusions 6(a), 6(c), and 7.

Notes to PM

1. Please note that when and if 40CFR is revised, the tolerance expression for bayleton cited under 40CFR§ 180.410 which reads (expressed as the fungicide)

should be restated to read (expressed as 1-(4-Chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone).

2. The proposed rotational crop tolerances if and when established, will need to be distinguished in the regulations from other pesticide tolerances which imply a registered (target crop) use [Ref. Rotational Crop Policy Statement., 46FR3018,1/13/81], RCB recommends that a section should be added to 40CFR§180.410 as follows:

§180.410 1-(4-Chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone; tolerance for residues.

(a) Specific tolerances. Tolerances are, etc."

(b) Tolerances with regional registration, etc.

(c) Tolerances for indirect or inadvertent residues. Tolerances are established for indirect or inadvertent residues of bayleton 1-(4-Chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone) and its metabolites containing the chlorophenoxy and triazole moieties (expressed as fungicide) in or on the raw agricultural commodities when present therein as a result of the application to growing crops listed in §180.410(a) as follows:

Commodities	Parts Per Million
Legume vegetables (succulent or dried) group	0.05
Foliage of legume vegetables (succulent only) group	1.0
Foliage of legume vegetables (dried and straw only) group	0.1
Corn, fresh (inc. sweet K + CWHR)	0.1
Corn, grain	0.01
Corn, forage	0.1
Corn, fodder	0.1
Cottonseed	0.02
Cotton, forage	0.5
Lettuce	0.01
Peanuts	0.01
Peanuts, forage	1.0
Peanuts, hay	0.1
Peanuts, hulls	0.01
Potatoes	0.05
Sorghum, grain	0.01
Sorghum, forage	0.1
Sorghum, fodder	0.1

3. If and when bayleton tolerances are established on rotational crops, and if and when tolerances are established for baytan on same crops (target and/or rotational), 40CFR§180.3(e) will need to be revised by addition of subsection as follows: "When and if tolerances are established for residues of both bayleton and baytan (substitute chemical names here) in or on a raw agricultural commodity, the total amount of such pesticides shall not yield more residue than that permitted by the higher of the two tolerances, calculated as baytan."

DETAILED CONSIDERATIONS

Manufacture and Formulation

The manufacture of bayleton (technical product) is discussed in RCB's reviews of PP#2F2664 (memo of A. Smith 9/9/82). The technical product has a purity of approximately 92%. The impurities in technical bayleton are not expected to pose a residue problem.

Two formulations of bayleton are included in this petition, Bayleton 50% Wettable Powder (EPA reg. No. 3125-320), and Bayleton 50% Wettable Powder in Water Soluble Packets (EPA Reg. No. 3125-340). Each of the two formulations contains 50% of the active ingredient, bayleton. Both formulations are currently registered for use on target crops for which there are tolerances.

The registration Division has agreed to take the responsibility to determine whether inert ingredients in formulations are cleared under 40CFR§180.1001.

Proposed Use

Bayleton 50% WP (#3125-320) and Bayleton 50% WP in Water Soluble Packets (#3125-340)

Both products are currently registered for disease control of certain field, fruit, and vegetable crops. Bayleton 50% WP is also registered for post-harvest use on pineapples. The remaining registered uses, dosage rates, and labeling precautions of both products are identical except for certain mixing instructions specific for each formulation as can be seen on page 3 of each label. Registered labels allow use by ground or aerial equipment in a minimum of 10 and 5 gallons of spray solution/A, respectively.

In this petition, we list the specific uses for which rotational crops may be planted, i.e., use on fruit crops and the post-harvest use on pineapples will not be listed since no rotational crops are expected to be planted in these areas.

Small Grains: Apply as needed beginning when disease symptoms first appear on leaves or stems using 1-4 oz act/A/aplication for a maximum of 8 oz act/A/season. There is a 21 day PHI.

Grasses Grown for Seed: Apply as needed at the rate of 2-8 oz act/A/application for a maximum of 1 lb act/A/season. There is a 5 day PHI.

Sugar Beats: Apply as needed beginning when disease symptoms first appear using 2-8 oz act/A/application for a maximum of 8 oz/act/A/season. There is a 15 day PHI.

Vegetable Crops: Apply as needed beginning when disease symptoms first appear up to day of harvest using 1-2 oz act/A/application for a maximum of 8 oz act/A/season.

Rotational crops planted after grasses grown for seed are expected to represent the worst case situation since the maximum use rate/season is the highest of all uses, 1 lb act/A/season.

Rotational Crops: The current statement on the registered labels for rotational crops reads: "Small grains, corn, sorghum, soybeans, peas and cucurbits may be planted 35 days after the last application of BAYLETON, however, forage or vines from these crops may not be used for food or feed. Root crops may be planted 120 days after the last application but tops must not be used for food or feed. All crops may be planted 12 months or later after the last application of BAYLETON without any restrictions."

In this petition, the petitioner proposes to revise the rotational crop statement to read as follows: "Treated areas may be replanted with any crop specified on this label as soon as practical after last application. For crops not on this label, the following plant-back intervals should be observed: Small grains, corn, cotton, lettuce, peanuts, potatoes, legume vegetables, sorghum and soybeans may be planted 14 days after the last application of BAYLETON. Forage or vines from these crops may be used for food or feed except for potato vines. Other root crops may be planted 120 days after the last application but tops must not be used for food or feed. All crops may be planted 12 months or later after the last application of BAYLETON without any restrictions."

The proposed rotational crop statement differ from that on the registered labels in that plant-back interval for rotational crops (small grains, corn, cotton, lettuce, peanuts, potatoes, legume vegetables, sorghum and soybeans) is now 14 days after the last application of BAYLETON instead of 35 days on the registered labels.

The petitioner proposes to remove the restriction against using forage or vines from these crops for feed except for potato vines. No changes are proposed for the second (other root crops) or the third categories of crops (all crops) which may be rotated 120 days and one year or later, respectively, after the last BAYLETON application.

Nature of Residues

No new metabolism studies have been submitted in this petition. The nature of residues in apples, cucumbers, tomatoes, and wheat has been discussed in RCB's reviews of PP#2F2665, 2F2668, 2F2704, and 3F2887. Bayleton, 1-(4-chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone, is absorbed, translocated and metabolized.

Metabolism studies have shown that the compound is rapidly converted to the reduction product, 1-(4-chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanol, also called KWG 0519, referred to as baytan. Further metabolism can also occur in some crops, with hydroxylation occurring on the t-butyl group of the molecule to form the metabolite designated KWG 1342 and to a lesser degree, KWG 1323. Once hydroxyl groups are formed on these molecules, the potential for conjugation to naturally occurring plant materials is present. The structural formulas for these compounds are shown in Attachment 1.

RCB concludes that the residue of concern in plants includes the parent compound, bayleton, and its free and conjugate metabolites containing the chlorophenoxy and triazole moieties.

In animals (rats, cows, pigs, hens), bayleton is metabolized and excreted with some transfer of residues to eggs and milk and deposition in tissues (PP#3F2887, memo of A. Smith, 9/12/83). The residues of concern in meat, milk, poultry and eggs consist of the parent compound, bayleton, and its metabolites containing the chlorophenoxy and triazole moieties.

RCB concludes that the metabolism of bayleton in plants and animals is adequately understood. The residue of concern is the parent compound, bayleton, and its metabolites containing the chlorophenoxy and triazole moieties as expressed in 40CFR§180.410.

Analytical Methods

Methods for Plant Commodities

Residues of bayleton in/on rotational crops were determined by the method described in PP#2F2665/FAP#2H5343 and PP#2F 2688/2F2704 (A. Smith, 9/9/82). The method entitled: "Residue Analytical Procedure for BAYLETON and Metabolites in Barley and Wheat", is authored by Obrist, J. J., et al, dated January 20, 1982. The method has undergone a successful method tryout and was judged adequate for enforcement of the existing tolerances for several plant and animal commodities. The method was recommended for inclusion in PAM II as Method III on April, 1986 (personal communication with M. Bradley, 12/8/86). The method determines bound and free residues of bayleton, baytan (KWG 0519), KWG 1342, and KWG 1323. Method sensitivity is reported at 0.01 ppm for each component in or on all commodities in this petition, except cottonseed and cotton foliage where method sensitivity is reported at 0.02 ppm for each compound.

Briefly, the procedure involves blending the sample in methanol-water using high shear blender, followed by a reflux of the solution and solids to solubilize additional extractables. After filtration to remove extracted solids, the solution is evaporated to remove solvents. The remaining water is buffered and enzymatically hydrolyzed to release conjugated residues. Residues are then extracted from the aqueous solution with dichloromethane and cleaned up using gel permeation chromatography. The extract is further purified by Florisil column chromatography. An initial eluate from the Florisil column is discarded followed by a second fraction of a slightly more polar solvent to remove bayleton, KWG 0519 and a portion of KWG 1323. A third fraction with an even more polar solvent removes KWG 1342 and the balance is KWG 1323. After derivation of KWG 1342 and KWG 1323 with trifluoroacetic anhydride, the concentrated extract is reanalyzed by gas chromatography employing nitrogen specific, alkali flame detection. Residue data are reported individually for bayleton, baytan (KWG 0519), and KWG 1342.

Sample chromatograms are included.

The limit of determination for the combined residues of bayleton in rotational crop commodities was reported at 0.02 ppm for cottonseed and soybeans, and at 0.01 ppm for the remaining rotational crop commodities listed in this petition.

Bayleton and metabolites KWG 0519 and KWG 1342, each was fortified at levels from 0.05 to 0.5 ppm to several rotational crop commodities including grains, forage, and straw. Recovery ranged from 70 to 120% for legume vegetables, 62 to 112% for cereal grains, 66 to 126% for oil seed crops (including processed products), 84 to 100% for leafy vegetables, and 76 to 98% for tuber vegetables. In 134 rotational crop controls, apparent bayleton residues were all at or below method detectability of 0.01 ppm. In one soybean control sample, the apparent residues were 0.02 ppm, and in one cottonseed control sample, the apparent residues were $\leq$0.02 ppm.

We conclude that adequate analytical methods are available for residue determination of bayleton and its free and conjugated metabolites in/on plant commodities. The method described in this petition (recommended by EPA on 4/86 for inclusion in PAM II as Method III), may be used for enforcement of the proposed bayleton tolerances in/on rotational crop commodities.

Methods for Animal Commodities

No new methods have been submitted with this petition. Methods are available in PAM II as Method I or II describing residue determination of bayleton and its free and conjugated metabolites in animal tissues, eggs, and all crops. Detection limit of either method is reported at 0.01 ppm.

RCB concludes that adequate analytical methods are available for residue determination of bayleton and its free and conjugated metabolites in animal tissues, and eggs. Method I or II of PAM II may be used for enforcement of any bayleton residues that may be incurred in animal commodities resulting from the ingestion of feed items with current tolerances as well as those proposed in this petition for rotational crops.

Interference With Other Registered pesticides

An interference study was conducted for nitrogen and/or halogen-containing compounds registered for use on beans, lettuce, peanuts, peas, potatoes, and soybeans. These compounds were tested for interference with bayleton and its metabolites. Results showed that bayleton and its metabolites could be identified and measured in the presence of other products currently registered on these crops.

Conclusions on the Analytical Methods

RCB concludes that adequate analytical methods are available for residue determination of bayleton and its free and conjugated metabolites in/on plant and animal commodities The method described in this petition (recommended by EPA on April, 1986 for inclusion in PAM II as Method III), may be used for enforcement of the proposed bayleton tolerances in/on rotational crops. Furthermore, method I or II in PAM II may be used for enforcement of any bayleton residues that may be incurred in animal commodities resulting from the ingestion of feed items with current tolerances as well as those proposed in this petition for rotational crops.

Storage Stability

A storage stability study was previously submitted and discussed in connection with PP#2F2665/FAP#2H5343 (memo of A. Smith, 9/9/82). Data on the stability of bayleton residues in plants under frozen conditions (-°C 20) showed no significant decomposition of residues for samples that were held in frozen storage for up to 299 days (forage) and 434 days (grains). Samples were held frozen for up to 466 days prior to analysis.

Residue Data

Raw agricultural Commodities

Data submitted reflect one broadcast application of Bayleton 50% WP to vegetation or soil using ground or aerial equipment at the rate of 0.5 lb act/A (This is a 1X rate for all crops except grasses grown for seed this rate is 0.5X the maximum allowable rate) with spray volume ranging from 6.9 to 60 gallons/A. The vegetation was cut and removed then a rotational crop was planted 0 to 19 days following the application, referred to as plant-back interval, abbreviated PBI. The interval from planting of rotational crops to sampling was dependent on crop maturity and ranged from 44 to 196 days. Residue data were reported individually for the parent compound, bayleton, its major metabolite, baytan, and a minor metabolite of baytan referred to as butanediol or KWG-1342. Table 1 gives a summary of test results in the form of total residues.

The combined residues of these three is summarized in Table 1. It should be noted that wherever there are measured residues, baytan accounted for the bulk of the

Table 1. Residues of Bayleton in/on Rotational Crops Following One Application at 0.5 lb act/A to Vegetation or Soil at Various PBI and PHI's:

Crop	Test Location	No. of Tests	PBI in Days	PHI in Days	Commodity Tested	Range of Total Residues in ppm 1/
Snap beans	CA, GA, IN, NY	4	12-15	61-103	pods	<0.01
					green vines	0.1-0.61
Dried beans	CA, ID, IN, KS	4	12-15	95-135	dried beans	<0.01-0.03
			15	95-135	hay	0.01-0.04
Lima beans	CA, NJ, WI	3	14	98-110	beans	<0.01-0.01
			14	98-110	pods	0.03
			14	98-110	green vines	0.04-0.69
Green peas	ID, MN, NY, WA	4	13-15	71-73	peas	<0.01-0.02
			13-15	71-73	pods	<0.01-0.04
			13-15	71-73	green vines	0.02-0.59
Dried peas	ID, WA	2	14	113	dried peas	<0.01
			14	113	hay	0.03-0.04
Soybeans	GA, IN, KS, MN MS	5	12-15	45-62	green forage	0.02-0.39
			12-15	116-195	dry beans	<0.01
			12-15	116-195	dry vines	0.02-0.07
Corn	GA, IN, KS, MN NY, TX	6	12-15	58-103	green forage	<0.01
			12-15	85-130	kernels	<0.01
			12-15	85-130	cobs	<0.01
			12-15	85-130	husk	<0.01
			12-15	117-175	fodder, dry	<0.01-0.1
			12-15	130-175	kernels, dry	<0.01
			12-15	130-175	cobs, dry	<0.01
			12-15	130-175	husk, dry	<0.01
Cotton	AZ, GA, MS, TX	4	14-19	132-175	cottonseed	<0.02
			14-19	132-175	cotton foliage	0.02-0.26
Lettuce	CA, NY, TX	4	4-15	88-105	lettuce head	<0.01
Peanuts	FL, GA, MS, TX	4	14	147-196	nut meat	<0.01
			14	147-196	hulls (shells)	<0.01
			14	147-196	vines, dry	<0.01
Potatoes	ID, IN, MN, NJ TX	5	12-14	103-111	tubers	<0.01
Sorghum	CA, GA, IN, KS TX	5	0-15	44-62	green forage	<0.01-0.06
			0-15	96-164	grain	<0.01
			0-15	96-164	hay	<0.01

1/ Total parent plus metabolites, KWG 0519 and KWG 1342 (reported individually).

residues, almost 90% and that its metabolite KWG 1342 accounted for the balance. There were little or no residues of the parent compound, bayleton (<0.01 to 0.01 ppm) in any of the commodities included in this petition.

Since the test dosage reflects 0.5X the maximum registered dosage of 1 lb act/A on grasses grown for seed, RCB is unable to conclude on the adequacy of the proposed tolerances for residues of bayleton in/on rotational crop commodities from this use. Residue data on rotational crops are needed following two applications of bayleton, each at 0.5 lb act/A, reflecting the minimum plant back interval (PBI) and PHI's. Alternatively, bayleton rates on grasses grown for seed can be limited to a maximum of 0.5 lb act/A/ season.

No data were submitted for peanut forage. Since peanut forage may constitute a feed item to livestock and since a tolerance of 1.0 ppm is adequate for the foliage of legume vegetables we will translate the data on legume forages and hay to this use on peanuts. A revised Section F is needed proposing a tolerance of 1.0 ppm for residues of bayleton in or on peanut forage. Furthermore, the proposed 0.01 ppm tolerance for peanut hay should be revised to 0.1 ppm for consistency with the tolerance in the dry foliage of legume vegetables. See also "Processing Study" below for additional data requirements for processed peanut products.

With the exception for rotation after grasses grown for seed, rotation after other crops on the bayleton labels (#3125-320 and 3125-340), will result in an indirect or inadvertent residues in the rotational crops not exceeding the proposed tolerances for the remaining rotational crop commodities except peanuts and peanuts, forage and hay.

We note, however, that bayleton residues (also proposed rotational crop tolerances) vary by more than a factor of 5 from residues for commodities in the legume vegetables and forage of legume vegetables group. For this reason, and to comply with the definition given in 40CFR§180.34(f)(5): "If maximum residues (tolerance) for the representative crops vary by more than a factor of 5 from the maximum value observed for any crop in the group, a group tolerance will ordinarily not be established. In this case, individual crop tolerances, rather than group tolerances, will normally be established." Accordingly, the petitioner is advised to revise Section F and propose individual rather than group tolerances for commodities within the legume vegetables group as follows:

Commodities	Parts Per Million
Legume vegetables (succulent or dried) group	0.05
Foliage of legume vegetables (succulent only) group	1.0
Foliage of legume vegetables (dried and straw only) group	0.1
Corn, fresh (inc. sweet K + CWHR)	0.1
Corn, grain	0.01
Corn, forage	0.1
Corn, fodder	0.1
Cottonseed	0.02
Cotton, forage	0.5
Lettuce	0.01
Peanuts	0.01
Peanuts, forage	1.0
Peanuts, hay	0.1
Peanuts, hulls	0.01
Potatoes	0.05
Sorghum, grain	0.01
Sorghum, forage	0.1
Sorghum, fodder	0.1

After compliance with our request above regarding rotation after grasses grown for seed and revising Section F by proposing individual rather than group tolerances for commodities within the legume vegetables group, RCB can conclude that the revised rotational crop statement is acceptable.

Processing Study

A processing study was conducted on peanuts grown in GA. In this test, peanuts were treated with one application of Bayleton 50% WP at the rate of 8 oz act/A. Samples were processed at the Food Protection Research & Development Center in Texas A & M University at College Park, Texas. Residues in processed products which are: meat, crude oil, soapstock, and refined oil were all non-detectable (<0.01 ppm). The residues in the rac, nut meat, was also non-detectable (<0.01 ppm).

In the absence of real residues in peanuts used in the processing study, we are unable to conclude if bayleton concentrates in the processed fractions of oil crops.

A cotton processing study discussed in connection with PP#3F2938/FAP4H5433 showed one detectable residue value

of 0.01 ppm in crude oil. No concentration of bayleton was reported in the remaining cottonseed byproducts (R. W. Cook, 1/27/84). For this reason, additional processing study is needed in which the seed of an oil crop contains real residues from exaggerated rates of application. Until a processing study is submitted and evaluated, we are unable to recommend for the requested tolerances for peanuts; and peanuts forage, hay and hulls.

Meat, Milk, Poultry, and Eggs

Studies involving the feeding of bayleton to cattle and poultry are discussed in RCB's reviews of PP#2F2665/FAP #2H5343/PP#2F2688/FAP#2F2704 (memo of A. Smith, 9/9/82).

Cattle and poultry feeding studies were performed to determine the effect of feeding a mixture (1:1) of bayleton and its metabolite KWG 0519 (Baytan). The studies included analysis for bound and free residues of bayleton and metabolites KWG 0519, KWG 1323, and KWG 1342.

Cattle

The residues found in milk and tissues are tabulated below:
Maximum Bayleton Residues Noted at Various Feeding Levels

Commodity	Feeding Levels in ppm		
	25	75	250
Milk	0.014	0.035	0.076
Liver	0.093	0.287	1.0
Kidney	0.412	0.787	2.27
Muscle	<0.01	0.019	0.043
Fat	0.024	0.086	0.211

Poultry

The residues found in eggs and tissues are tabulated below:

Maximum Bayleton Residues Noted at Various Feeding Levels

Commodity	Feeding Levels in ppm			
	10	25	75	250
Eggs	0.031	0.071	0.225	1.188
Muscles				0.023
Fat				0.148
Skin				0.199
Gizzard				0.090
Liver	0.045	0.085	0.288	1.406

In this petition, the feed items involved are the grains, forage, hay or straw of small grains, corn, cotton, and legume vegetables; as well as the forage and hay of peanut. Considering the feed items in this use as well as all uses for which there are tolerances and pending tolerances, the maximum dietary intake for cattle was calculated at 64.2 ppm as follows:

Feed Items	Tolerance (ppm)	Percent in Feed	Maximum Dietary Intake (ppm)
Grass seed cleanup (including hulls)	145	40	58
wheat or barley Forage	15	40	6
Wheat or barley Grain	1	20	0.2
		Total	64.2

Similarly, the maximum dietary intake for poultry was calculated at 0.73 ppm as follows:

Feed Items	Tolerance (ppm)	Percent in Feed	Maximum Dietary Intake (ppm)
Wheat or barley Grain	1	70	0.70
Bean seed 1/	0.1	30	0.03
		Total	0.73

1/ Proposed level in this petition.

From the available data and pending compliance with our request regarding rotation after grasses grown for seed and revising Section F by proposing individual rather than group tolerances, RCB can conclude that the present meat, milk, poultry and eggs tolerances will not be exceeded as a result of ingesting feed items from rotational crops as well as commodities from target crops with established tolerances.

Other Considerations

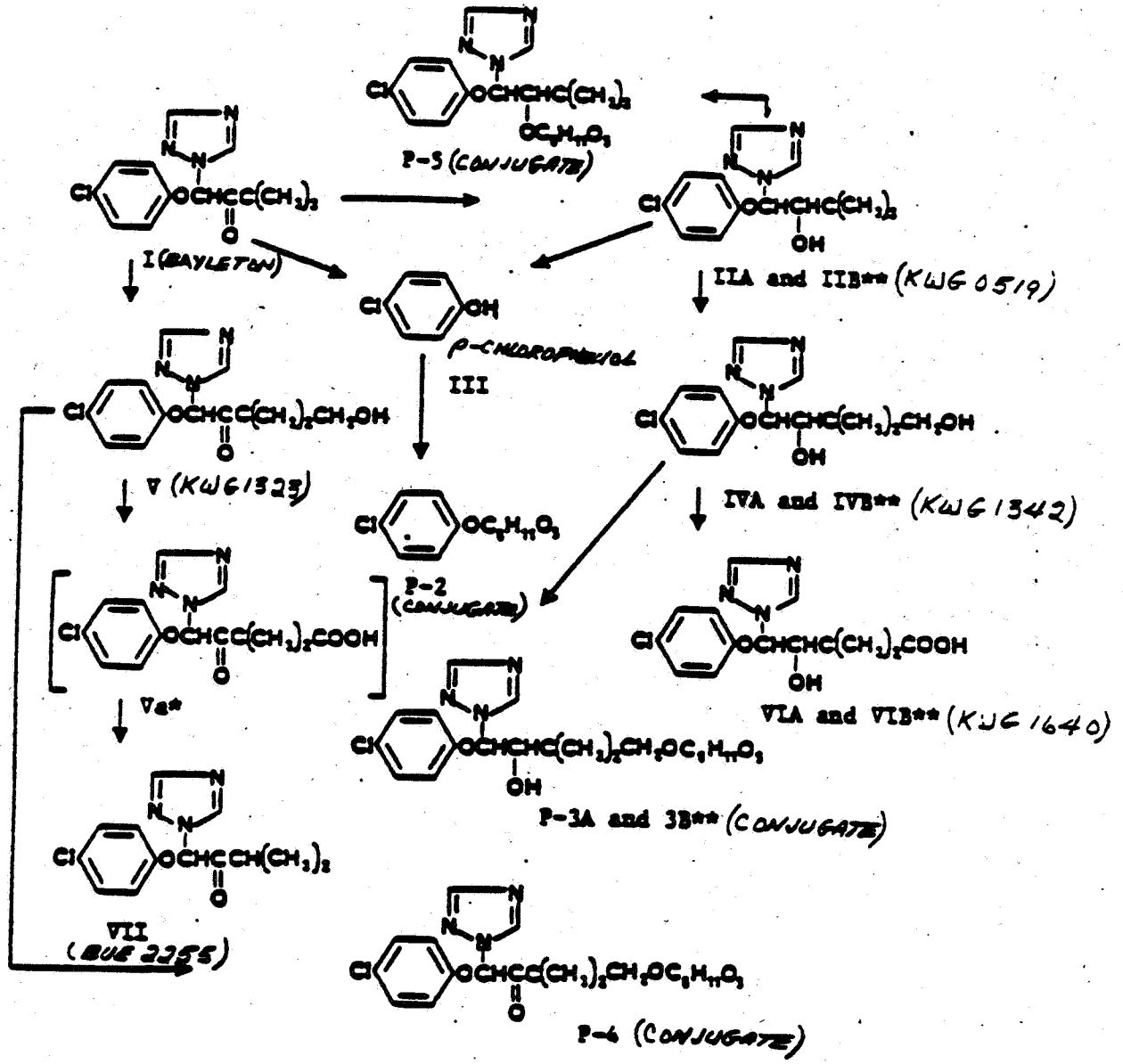
An International Residue Limit Status Sheet is attached. Canada and Mexico have no established tolerances for bayleton in/on rotational crop commodities cited in the petition. A Codex residue limit of 0.1 ppm is currently established for the sum of triadimefon and triadimenol in/on peas. We do not foresee compatibility between US and Codex tolerances for bayleton due to the differences in the tolerance expression. The US tolerances are expressed as the parent compound, bayleton, plus metabolites containing the chlorophenoxy and triazole moieties, whereas, Codex tolerances are expressed as the parent, bayleton, and hydroxylated bayleton (KWG 1323).

Attachments:
I. Bayleton Metabolism (one page).
II. Codex Sheet (one page).

RDI: P.V. Errico: 7/16/87: R. D. Schmitt: 7/16/87.
TS-769:RCB:CM#2:RM814A:S.Malak:X557-4379:12/22/86.

cc With Attachments: Circu, RF, SF (bayleton or Triadimefon), PP#6F3419, S. Malak, TOX, EAB, EEB, RD (PM #21), Robert Thompson (RTP), and PMSD/ISB.

Attachment 1



Proposed metabolic pathway for BAYLETON (I) in wheat.

*Va is a theoretically unstable β-ketoacid proposed precursor of VII.

**A and B designations refer to diastereomeric isomer forms.

SOURCE: PP#2F2665/FAP#2H5343

Attachment 2

INTERNATIONAL RESIDUE LIMIT STATUS

CHEMICAL Bayleton (Triadimefon)

CODEX NO. 133

CODEX STATUS:

[x] No Codex Proposal Step 6 or above

Residue (if Step 8): Sum of triadimefon and triadimenol

Crop(s)	Limit (mg/kg)
peas	0.1*

CANADIAN LIMITS:

[x] No Canadian limit

Residue:

Crop(s)	Limit (mg/kg)

MEXICAN LIMITS:

[x] No Mexican limit

Residue:

Crop(s)	Limit (mg/kg)

PROPOSED U. S. TOLERANCES:

Petition No. PP#6F3419

RCB Reviewer: Sami Malak

Codex Coordinator: Fred Ives, 12/1/86

Residue: Bayleton 1-(4-Chlorophenoxy)-3,3-dimethyl-1 (1H-1,2,4-triazole-1-yl)-2-butanone and its metabolites containing chlorophenoxy and triazole moieties (expressed as the fungicide).

ROTATIONAL

Raw Agricultural Commodities Under 40CFR§180.410(c)	Limit (mg/kg)
Legume vegetables group seed, succulent (including pods) and dry	0.05
Foliage of legume vegetables group	
vines, green	1.0
hay	0.1
Corn forage, green	0.1
Corn kernel (K + CWHR)	0.1
Corn fodder, dry	0.05
Corn kernel, dry	0.01
Cottonseed	0.02
Cotton forage	0.5
Lettuce	0.01
Peanut meats	0.01
Peanut hulls	0.01
Peanut vines (dry)	0.01
Potatoes	0.05
Sorghum, grain	0.01
Sorghum, fodder and forage	0.1

Notes: * At or about limit of determination.

Form revised 1986