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Date Out EFB: 6/11/82

To: Hank Jacoby
Product Manager 21
Registration Division (TS-767)

From: Dr. Willa Garner, Chief SWC for
Review Section No. 1
Environmental Fate Branch
Hazard Evaluation Division (TS-769)

Attached please find the environmental fate review of:

Reg./File No.: 3125-320

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

Type Product: Fungicide

Product Name: BAYLETON 50% Wettable Powder Fungicide

Company Name: Mobay Chemical Corporation

Submission Purpose: New uses on wheat and barley

ZBB Code: other

Date In: 4/9/82

Date Completed: 6/11/82

ACTION CODE: 335

EFB # 278

TAIS (level II) 63

Days 4

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

1. INTRODUCTION

1.1 The registrant, Mobay Chemical Corporation, is requesting amendment of its BAYLETON 50% WP Fungicide label (EPA Reg. No. 3125-320) to include use on wheat and barley.

1.2 According to the EFB evaluation of 3125-320 dated June 17, 1981, section 4.9, the only data needed to support new uses of Bayleton on wheat and barley are rotational crop data.

1.3 All data with this submission are in accession number 070746.

1.4 Bayleton is also known as triadimefon.

2. DIRECTIONS FOR USE

2.1 Apply 1/16 - 1/4 lb ai/A to diseased plants by ground or air. One or 2 applications are recommended, but the total amount of product applied should not exceed 1/2 lb ai/A per crop season. The last application should not be made within 21 days of harvest.

2.2 The following rotational crop restriction appears on the label:

> "Treated areas may be replanted with any crop specified on this label as soon as practical after last application. All other crops must not be planted within 120 days of last application."

It is assumed that wheat and barley are the only crops that can be replanted since no other field/vegetable crops appear on the label.

3. DISCUSSION OF DATA

3.1 The Stability of BAYLETON™ and KWG 0519 Residues in Apple Peel During Frozen Storage; J. S. Thornton; report no. 54192.

The 2 compounds studied were found to be stable over a period of 14 months.

3.2 Fate of ®BAYLETON-^{14}C as a 25 Percent Wettalble Powder on Tomatoes and Cucumbers; Donald Nye; report no. 68593.

The parent converts primarily to KWG-0519 (Baytan). At later intervals an unidentified polar organosoluble metabolite formed. (see section 3.3, below). When applied to the fruit, only parent and KWG 0519 (isomers I and II) were found.

3.3 Further Identification of Polar Activity from ®BAYLETON Cucumber and Tomato Metabolism Samples; R. J. Puhl; report no. 68594.

The unidentified polar organosoluble metabolite (in section 3.2, above) was shown to be a glucoside of KWG 0519 loosely bound to another naturally occurring moiety that readily degraded to KWG 0519 glucoside.

3.4 Metabolism of ®BAYLETON in Wheat; Morgan and Lenz; report no. 80293.

Parent was converted primarily to KWG 0519 and other minor metabolites plus their glycoside conjugates

3.5 The Stability of ®BAYLETON and BAYTAN™ Residues in Wheat Forage During Frozen Storage; D. R. Fredrickson; report no. 80338.

Green wheat forage treated with BAYLETON, homogenized and stored at -18 °C, showed no change after 63 and 299 days of storage.

3.6 Residue Analysis Procedure for ®BAYLETON and Metabolites in Barley and Wheat; J. J. Obrist et al; report no. 80488.

Samples are blended in methanol-water, refluxed, filtered and evaporated to remove organic solvents. In the remaining solution, conjugated residues are enzymatically released and then extracted with dichloromethane followed by cleanup. The extract is then subjected to Florisil column chromatography and eluted fractions, after derivatization with trifluoro acetic anhydride are concentrateed and analyzed by GC with a nitrogen specific, alkali flame detector.

Recoveries of BAYLETON, KWG 0519 and KWG 1342 were 70 - 120% at 0.1 - 2 ppm fortifications. At 0.05 ppm fortifications, 3 of 15 samples caused the recovery range to be extended to 58 - 132%. (Using a different cleanup procedure improved recoveries slightly).

3.7 The Effect of Frozen Storage at 0 to -10 °F on ®BAYLETON and BAYTAN™ in Wheat Grain; L. K. Shiller; report no. 80568.

Fortification at 0.24 - 0.43 ppm and storage (frozen) for 434 days resulted in no perceptible decomposition.

3.8 Effect of ®BAYLETON on Asymbiotic Nitrogen Fixation in Soil; Minor and Ernst; report no. 80604.

Microbe studies are currently not required. However, no effect was seen after 5 days of incubation at 30 °C in sandy loam soil.

3.9 Residues in Rotational Crops Following Tratment of a Target Crop with ®BAYLETON-^{14}C; Fredrickson and Thornton; report no. 80606.

Procedure

A galvanized metal tub (2 X 9 feet) was filled with 5 inches of gravel followed by 12 inches of sandy loam soil (56% sand, 34% silt, 10% clay, 3% OM, pH = 5.5, CEC = 22.6).

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In the fall, the tub was planted to sage winter wheat, which was allowed to grow outside until becoming dormant. After 6 weeks dormancy, the tub was brought into a greenhouse where growth of the wheat resumed. The wheat was treated at the boot stage with BAYLETON - ring - UL - ^{14}C at 0.5 lb ai/A. At 28 days post-application, the soil was tilled and replanted to kale, red table beets and spring wheat. At 119 days post-application, the soil was tilled again and planted to the same rotational crops.

Crop samples were analyzed for total ^{14}C by combustion and LSC and were analyzed for residues by an extraction procedure and co-chromatography (TLC). Soil aliquots were also combusted and extracted for TLC analysis.

Results

See Tables II and III, below.

Conclusions

These data support a 1 month interval for leafy vegetables and root crops and a 4 month interval for small grains.

Triadimefon environmental fate review

Page _____ is not included in this copy.

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___ Description of product quality control procedures

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The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

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In the following rotational crop studies (reviewed in sections 3.10 - 3.16, below), a plot in Vero Beach, Florida of sandy soil and the following characteristics was used: 92% sand, 1% silt, 7% clay, 0.8% OM, pH = 5.9 and CEC = 1.1. Rain data is provided.

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3.10 Rotational Crop Study - Corn; report no. 80583.

Procedure/Results

Bare soil was treated 2 times with Bayleton at 1/4 lb ai/A per application on 1/24 and 1/30/80. Corn was planted 35 days post-treatment and sampled at 39, 83 and 91 days after planting.

The 39-day old plants showed 0.12 ppm total residues (0.10 ppm Baytan plus 0.02 ppm KWG 1342) in green forage and the 91-day old green forage sample 0.10 ppm total residues (0.07 ppm Baytan plus 0.03 ppm KWG 1342). No detectable residues were found in milk stage kernel of 83-day old corn plants. ← these corn plants are mature sweet corn stage

Conclusions

An interval when no residues will be detected in rotational corn cannot be determined from this data.

3.11 Rotational Crop Study - Corn; report no. 80584.

Procedure/Results

Bare soil was treated 2 times with Bayleton 1/4 lb ai/A per application on 10/25 and 11/01/79. Corn was planted 126 days post-treatment and sampled at 39, 83 and 91 days after planting.

The 39- and 91-day old green forage showed 0.02 ppm total residues as which were determined to be Baytan. Kernels from the 83-day old plants showed no detectable residues. ← mature

Conclusions

An interval when no detectable residues will be found in rotational corn cannot be determined from this data.

3.12 Rotational Crop Study - Corn; report no. 80585.

Procedure/Results

Bare soil was treated 2 times with Bayleton at 1/4 lb ai/A per application on 1/24 and 1/31/80. Corn was planted 365 days after application and sampled at 31, 45 and 104 days after planting. Residues were not detected in green forage or milk stage kernels in corn at any interval.

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Conclusions

The data support a 1 year rotational interval for small grains. ←

3.13 Rotational Crop Study - Black-eyed Peas; report no. 80590.

Procedure/Results

Bare soil was treated 2 times with Bayleton at 1 lb ai/A per application on 1/24 and 1/31/80. Black-eyed peas were planted 35 days after treatment and were sampled at 74 days after planting.

No detectable residues were found.

Conclusions

The data support a 1-month rotational interval for black-eyed peas.

3.14 Rotational Crop Study - Black-eyed Peas;report no. 80591.

Procedure/Results

Bare soil was treated 2 times with Bayleton at 1/4 lb ai/A per application on 1/24 and 1/31/80. Black-eyed peas were planted 35 days after treatment and sampled 74 days after planting.

Results showed 0.01 ppm total residues (that were identified as parent) in the peas, no detectable residues in the pods and 0.47 ppm total residues (0.01 ppm as parent, 0.42 ppm as Baytan and 0.04 ppm as KWG 1342) in the vines.

Conclusions

An interval when no residues will be detected in rotational black-eyed peas cannot be determined from the data.

3.15 Rotational Crop Study - Black-eyed Peas; report no. 80592.

Procedure/Results

Bare soil was treated 2 times with Bayleton at 1/4 lb ai/A per application on 12/27/79 and 1/02/80. Black-eyed peas were planted Black-eyed peas were planted 64 days after treatment and sampled 97 days after planting.

Results showed detectable residues only in the vines at 0.01 ppm total residues which were identified as KWG 1342. It is noted that the control showed 0.02 ppm total residues (which were identified as parent) in the vines.

Conclusions

The data support a 2-month rotational interval for black-eyed peas but the vines may not be used for food or feed purposes.

3.16 Rotational Crop Study - English Peas; report no. 80593.

Procedure/Results

Bare soil was treated with Bayleton 2 times at 1/4 lb ai/A per application on 1/24 and 1/31/80. English peas were planted 365 days after treatment and were sampled 59 days after planting. No detectable residues were found in the peas and pods but 0.05 ppm total residues (which were identified as Baytan) were found in the vines.

Conclusions

The data support a 1-year rotational interval for English peas but the vines may not be used for food or feed purposes.

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The studies reviewed in sections 3.17 - 3.23, below, were conducted in Stanley, Kansas in silty clay loam soil of the following profile: 8% sand, 62% silt, 30% clay, 3.2% OM, pH=6.7 and CEC=12.

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3.17 Rotational Crop Study - Radishes; report no. 80579.

Procedure/Results

Bare soil was treated with Bayleton 2 times at 1/4 lb ai/A per application on 7/18 and 7/25/80. Radishes were planted 33 days after treatment and were sampled 33 days after planting.

Results showed no detectable residues in the roots and 0.02 ppm total residues in the tops (which were identified as 0.01 ppm parent and 0.01 ppm Baytan).

Conclusions

The data support a 1-month rotational interval for radishes but the tops may not be used for food or feed purposes. It is difficult to extend this interval to all root crops because radishes are not the preferred root crop for use in rotational crop studies.

3.18 Rotational Crop Study - Radishes; report no. 80580.

Procedure/Results

Bare soil was treated with Bayleton 2 times at 1/4 lb ai/A on 6/20 and 6/27/80. Radishes were planted 61 days after treatment and were sampled 33 days after planting.

No detectable residues were found in the roots or tops.

Conclusions

The data support a 1-month rotational interval for radishes. This interval cannot be confidently extended to all root crops. See 3.17, above.

3.19 Rotational Crop Study - Radishes; report no. 80581.

Procedure/Results

Bare soil was treated 2 times with Bayleton at 1/4 lb ai/A per application on 4/21 and 4/28/80. Radishes were planted 121 days after treatment and were sampled 33 days after planting. Results show 0.01 - 0.02 ppm total residues (which were identified as parent) in the tops and 0.01 ppm in the roots (which were identified as KWG 1342).

Conclusions

An interval when no residues will be detected cannot be determined from the data.

3.20 Rotational Crop Study - Snap Beans; report no. 80582.

Procedure/Results

Bare soil was treated 2 times with Bayleton at 1/4 lb ai/A on 5/15 and 5/22/79. Snap beans were planted 366 days after treatment and were sampled 110 days after planting.

Detectable residues were not found in the vines or beans.

Conclusions

The data support a 1-year rotational interval for snap beans.

3.21 Rotational Crop Study - Wheat; report no. 80576.

Procedure/Results

Bare soil was treated with Bayleton 2 times at 1/4 lb ai/A per application on 8/15 and 8/22/79. Wheat was planted 30 days after application and sampled 31 and 46 days after planting (green forage) and 293 days after planting (grain and straw).

In the 31-day old plants (green forage), there were 0.18 ppm total residues (identified as 0.16 ppm Baytan plus 0.02 ppm KWG 1342).

In the 46-day old plants (green forage), there were 0.10 ppm total residues (identified as 0.08 ppm Baytan plus 0.02 ppm KWG 1342).

No residues were detected in the grain samples and 0.05 ppm total residues (identified as 0.02 ppm parent plus 0.03 ppm Baytan) were detected in the straw samples.

Conclusions

The data support a 1-month for wheat if only the grain is used and green forage and straw are not used for food or feed purposes.

3.22 Rotational Crop Study - Wheat; report no. 80577.

Procedure/Results

Bare soil was treated 2 times with Bayleton at 1/4 lb ai/A on 7/15 and 7/22/79. Wheat was planted 61 days after treatment and was sampled for green forage at 31 and 46 days after planting and for grain and straw 293 days after planting.

In the 31-day old plants (green forage), there were 0.04 ppm total residues (identified as Baytan) and in the 46-day old plants there were 0.07 ppm total residues (identified as 0.01 ppm parent plus 0.06 ppm Baytan). No residues were detected in the threshed grain but 0.04 ppm total residues (identified as 0.03 ppm parent plus 0.01 ppm KWG 1323) were detected in the straw.

Conclusions

The data support a 2-month rotational interval for wheat if only the grain is used and the green forage and straw are not used for food or feed purposes.

3.23 Rotational Crop Study - Sorghum; report no. 80578.

Procedure/Results

Bare soil was treated with Bayleton 2 times at 1/4 lb ai/A on 5/15 and 5/22/79. Sorghum was planted 366 days after treatment and was sampled 32 and 46 days later (as green forage) and 162 days later as grain and straw.

No residues were found in green forage, threshed grain or straw.

Conclusions

The data support a 1-year rotational interval for sorghum.

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The studies reviewed in sections 3.24 - 3.27, below, were conducted in Vero Beach, Florida, in sandy soil of the following characteristics: 92% sand, 1% silt, 7% clay, 0.8% OM, pH=5.9 and CEC=1.1.

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3.24 Rotational Crop Study - Turnips; report no. 80586.

Procedure/Results

Bare soil was treated with Bayleton 2 times at 1/4 lb ai/A on 1/24 and 1/31/80. Turnips were planted 35 days after treatment; the tops were sampled at 39 and 62 days after planting and the roots were sampled at 62 days after planting.

Results showed 0.51 ppm (identified as 0.25 ppm Baytan plus 0.26 ppm KWG 1342) total residues in the 39-day old tops and 0.53 total residues (identified as 0.16 pm Baytan plus 0.34 ppm KWG 1342 plus 0.03 ppm KWG 1323) in the 62-day old tops. In the 62-day old roots, total residues of 0.04 ppm (identified as Baytan) were found.

Conclusions

An interval when no detectable residues will be found in rotational turnips cannot be determined from this data.

3.25 Rotational Crop Study - Turnips; report no. 80587.

Procedure/Results

Bare soil was treated with Bayleton 2 times at 1/4 lb ai/A on 12/27/79 and 1/02/80. Turnips were planted 64 days after treatment; the tops were sampled 39 and 63 days after planting and the roots were sampled 63 days after planting.

The 39-day old tops showed 0.08 ppm total residues (identified as 0.07 ppm parent plus 0.01 ppm KWG 1342) and the 63-day old tops showed 0.24 ppm total residues (identified as KWG 1342). The 63-day old roots showed 0.12 ppm total residues (identified as 0.01 ppm parent plus 0.08 ppm Baytan plus 0.02 ppm KWG 1342 plus 0.01 ppm KWG 1323).

Conclusions

An interval when no detectable residues will be found in rotational turnips cannot be determined from this data.

3.26 Rotational Crop Study - Turnips; report no. 80588.

Procedure/Results

Bare soil was treated with Bayleton 2 times at 1/4 lb ai/A on 10/25 and 11/01/79. Turnips were planted 126 days after planting. The tops were sampled 39 and 56 days after planting and the roots were sampled 56 days after planting.

In the 39-day old tops were found 0.07 ppm total residues (identified as Baytan) and in the 56-day old tops were found 0.13 pm total residues (identified as 0.03 ppm Baytan plus 0.09 ppm KWG 1342 plus 0.01 ppm KWG 1323). No detectable residues were found in the roots.

Conclusions

The data support a 4-month rotational interval for root crops if the tops are not used for food or feed.

3.27 Rotational Crop Study - Turnips; report no. 80589.

Procedure/Results

Bare soil was treated with Bayleton 2 times at 1/4 lb ai/A on 10/25 and 11/01/79. Turnips were planted 364 days after treatment. The tops were sampled 33 and 68 days after planting and the roots were sampled 68 days after planting.

Residues were not detected in any of the tops or roots sampled in this study.

Conclusions

The data support a 1-year rotational interval for root crops.

4. CONCLUSIONS/RECOMMENDATIONS

4.1 Definitive amounts of Bayleton and some of its degradation products were identified in the ^{14}C rotational crop study. In addition, some of the cold studies showed higher residues at longer intervals than those found in the ^{14}C studies.

4.2 Considering all the rotational crop data, the following crop rotation restrictions can be supported:

> "Small grains - Small grains may be planted 4 months after application but only the grain may be used for food or feed. Alternately, small grains may be planted 1 year after application."

"Root crops - Root crops may be planted 4 months after application but the tops may not be used for food or feed. Alternately, root crops may be planted 1 year after application."

4.3 The data do not support any interval on leafy vegetables. A rotational crop study conducted under use conditions is needed.

Samuel M Creeger June 11, 1982

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