2-19-85.

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

FEB 19 1985

OFFICE OF PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: EPA Reg. No. 3125-320; BAYLETON 50% Wettable Powder [1-(4-chlorophenoxy-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl-2-butanone] on various commodities. Submission of previously unsubmitted residue data. [Accession Nos. 254696 and 254698; RCB No. 172]

FROM: Susan V. Hummel, Chemist
Special Registration Section II
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

Susan V. Hummel

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

TO: Henry M. Jacoby, PM#21
Herbicide-Fungicide Branch
Registration Division (TS-767)

AND

Toxicology Branch
Hazard Evaluation Division (TS-769)

AND

Exposure Assessment Branch
Hazard Evaluation Division (TS-769)

Mobay Chemical Corporation has submitted studies on BAYLETON (triadimefon) which it believes had not been previously submitted to EPA. Mobay has submitted these studies in the process of conducting a complete review of their data base for BAYLETON in order to comply with the State of California Administrative Code. The reports in this submission are tabulated in Appendix I. These data are unsolicited. A detailed evaluation of these data and their suitability to fill any data gaps will be done in connection with the Registration Standard. No Registration Standard has been done on triadimefon. The triadimefon Registration Standard is being planned for FY86 or FY87 (G. Beusch, 1/15/85).

Several of the reports have been previously submitted. Report numbers 80293 (1982, Metabolism of BAYLETON on Wheat), 80338 (1981, The Stability of BAYLETON and BAYTAN in Wheat Grain

During Frozen Storage), 80488 (1982, Residue Analysis Procedure for BAYLETON and Metabolites in Barley and Wheat), and 80568 (1982, The Effect of Frozen Storage at 0 to -10°F on BAYLETON and BAYTAN in Wheat Grain) were submitted and reviewed in connection with PP#2F2665 (9/9/82, A. Smith).

Tolerances have been established for residues of triadimefon and metabolites containing the chlorophenoxy and triazole moieties on the following racs (40CFR§180.410):

0.04ppm	Milk; eggs; fat, meat, and meat byproducts of poultry and hogs
0.05ppm	Almonds
0.1ppm	Almond Hulls
0.2ppm	Grass forage
0.3ppm	Curcurbits
0.5ppm	Sugar beets
1.0ppm	Apples; barley grain; chick peas, seed, dry; grapes; pears; wheat grain; and fat, meat, and meat byproducts of cattle, goats, horses, and sheep
3.0ppm	Pineapples, fresh; sugar beet tops
4.0ppm	Apricots, nectarines, peaches, plums(fresh prunes)
5.0ppm	Barley straw, wheat straw
15ppm	Barley, green, forage; wheat, green, forage
105ppm	Grass seed, straw
145ppm	Grass seed, cleaning (including hulls)

Food and Feed Additive Tolerances have been established for residues of triadimefon on the following processed commodities (21CFR§193.83 and 21CFR§561.93):

3.0ppm	Grape pomace
4.0ppm	Apple pomace and milled fractions (except flour) of barley and wheat
7.0ppm	Raisin waste

CONCLUSIONS

1. The following studies should be reviewed by EAB rather than RCB (Acc#254698):

Report No.	Subject
68626	Soil Metabolism
68720	Uptake in Soil and Rotational Crops
69811	Residues in Rotational Crops
69812	Residues in Rotational Crops
80702	Soil Persistence Study
80296	Exposure Data
67658	Soil Recovery Data
67755	Soil Recovery Data
69237	Soil Recovery Data
49461	Stability in Soil
45323	Physical Chemistry, Re-entry

Report No.	Subject
67356	Physical Chemistry, Re-entry
82584	Physical Chemistry, Re-entry
80724	Analytical Method - Water

2. The following studies should be reviewed by EAB in addition to RCB (Acc#254698).

Report No.	Subject
67061	Metabolism in Barley, Soil, and Rotational Crops
68645	Metabolism in Summer Wheat and Soil
66741	Metabolism and Environmental Behavior
68125	Metabolism and Environmental Behavior
49637	Analytical Method in Plants and Soil
69810	Analytical Method in Plants and Soil Including Metabolites

3. The following studies on Flavor Evaluation of Apples and Grapes are irrelevent and were not reviewed: 53782, 66153, 67763, 67764, and 68192.

4. KWG 1342 was identified as a major metabolite in barley. Residue data on wheat and barley submitted in connection with PP#2F2665 included analysis for KWG 1342.

5. BEB 217, a triazolyl-alanine derivative, was identified in wheat straw. We defer to TOX to determine the significance of this metabolite. The final report on this study should be submitted to EPA.

6. The swine study referred to in Report No. 66741 should be submitted.

7. Analytical methodology is available to separate the enantiomers of triadimenol and determine the enantiomers of triadimefon. This method should be held until it is needed.

8. Most of the residue data submitted cannot be evaluated. Except for the residue data on wheat and barley in Accession No. 254696, none of the reports included the date of harvest, conditions of storage of samples prior to analysis, raw data sheets, or sample chromatograms. Mobay should submit this information. If these data are validated, we can conclude that residues are not likely to exceed the established tolerances.

9. Much of the residue data submitted reflected application at rates less than the maximum rate or PHI's greater than the minimum PHI.

10. Report No. 82875 on residues in cucumbers was listed in the table of contents, but was not included. This study should be submitted.

RECOMMENDATIONS

We defer to TOX to determine the significance of the triazolylalanine derivative. Mobay should submit the final report on wheat metabolism study, the swine study, the cucumber residue data, and the date of harvest, conditions of storage, raw data sheets, and sample chromatograms for all residue trials. The data reviewed in this submission should be considered in the Registration Standard.

Detailed Considerations

MANUFACTURING PROCESS

The manufacturing process was discussed in our review of PP#2F2665. We concluded that the impurities in the technical Bayleton were not likely to present a residue problem. (9/9/82, A. Smith). No new data on the manufacturing process or impurities were included in this submission. Technical Bayleton contains 90 to 94% triadimefon.

FORMULATION

Bayleton is formulated as a wettable powder, containing 50% active ingredient. The f[illegible]ations inert ingredients are cleared for use under §180.

FOOD USES

RAC	Rate(oz ai/A)	Max oz ai/A/season	PHI(days)
Apples	1-8	32	0
Barley and Wheat	1-4	8	21
Curcurbits	1-2	8	0
Grapes	1-3	8	14
Grass	4-8	16	5-77*
Pears	1-4	12	0

*5 day PHI with forage and feeding restriction
77 day PHI for feeding regrowth

NATURE OF THE RESIDUE

Plants

The nature of the residue has been discussed in our petition reviews (PP#3F2887, 2F2704, 2F2665, 1F2474). Plant metabolism studies have shown the presence of the parent compound, and its metabolites KWG 0519 (Baytan or triadimenol), KWG 1342, and KWG 1323. (See Appendix 2 for names and structures of metabolites.) However, except for sugar beet tops, the levels of the metabolites KWG 1342 and KWG 1323 have been low (<10%). Except for sugar beet tops, the significant components of plant residues had been considered to be the parent compound and its metabolite KWG 0519 (triadimenol).

Wheat and Barley

Report No. 80293, J. G. Morgan and M. F. Lenz, 1982, "Metabolism of BAYLETON in Wheat". Accession No. 254696. (Previously submitted in PP#2F2665.) It was concluded that the significant BAYLETON metabolites are two diastereomeric forms of KWG 0519 (triadimenol) and KWG 1342. The analytical method used is also described.

Report No. 67061, 10/19/77, K. Vogeler, "Second Report, The Metabolism of ^{14}C Bayleton in Summer Barley and Soil and in Rotational Crops."

This report should be reviewed by EAB as well as RCB.

An acetone/water extraction was used for this study. After five days, the metabolites were predominantly KWG 0519. After 17 days, 35% unidentified polar compounds, "presumably glycosides", were reported. Later, essentially all of the residue was non-extractable. It was reported that both polar compounds and non-extractable residues were being given further study. This study is not particularly useful to RCB since no attempt was made to characterize any metabolite other than KWG 0519, and there was a large amount of unidentified polar compounds and nonextractables.

Report No. 68626, 11/13/79, K. Vogeler, R. Brennecke, "Status of the Studies on the Soil Metabolism of Bayleton Applied on Summer Barley using [Triazole Ring-3,5-^{14}C] and [Benzene Ring-U-^{14}C] Triadimefon."

This report should be reviewed by EAB, not RCB.

Report No. 68645, 11/7/79, K. Vogeler, R. Brennecke, "Studies on the Metabolism of Triadimefon in Summer Wheat and in Soil after Application of [^{14}C] Bayleton on Summer Wheat."

This report should be reviewed by EAB in addition to RCB.

A single application of Bayleton 50% WP (.222 lb ai/A) was made at growth stage K. (No description of growth stage K was available.) Wheat was harvested 49 days later. The residue was extracted by exhaustive extraction using the following solvents: acetone/hexane (1:1), methanol, aqueous ammonia, methanol, and hot (80°C) DMSO. Analysis was by liquid scintillation counting. The residue in wheat straw was 7.39 ppm Bayleton equivalent. The residue in wheat kernels was 0.04 ppm Bayleton equivalent. The residue in wheat straw consisted of 61% polar compounds, 25% triadimenol form A, 7% triadimenol form B, 2% KWG 1342 forms A and B, 2% Bayleton, and 3% non-extractable. The polar compounds were hydrolyzed. 4-Chlorophenol was identified as one of the polar compounds.

Report No. 68720, 11/15/79, K. Vogeler, W. Steffens, "Supplementary Accountability Tests using [Benzene-ring U-14C] Triadimefon after Spray Treatment of Summer Wheat in Field Lysimeters with Undisturbed Soil Profiles."

This report should be reviewed by EAB, not RCB. It concerns uptake from soil and rotational crops.

Report No. 68793, 5/20/80, R. Brennecke, K Vogeler, "Status of the Studies on the Metabolism of Triadimefon in Straw of Summer Barley after Application of [triazole ring 3,5-^{14}C] and [phenyl-UL-^{14}C] Bayleton on Summer Barley."

A single application of ^{14}C Bayleton 50% WP (.222 lb ai/A) was made between growth stages H and J. No description of these growth stages was available. Only the straw was examined since the radioactivity was present almost exclusively in the straw. Ground straw was extracted with methanol/water/ammonia (65:23:12). The methanol/ammonia was evaporated. The extract was shaken with dichloromethane/ n-hexane. The organic phase was cleaned up with a Sep-pak cartridge. The fractions were further separated by TLC several times. Final identification of both forms of KWG 1342 was made by reverse isotope dilution analysis. The polar phase was analyzed only qualitatively due to significant losses of radioactivity. The polar metabolites were acetylated, cleaned up on Silica Gel columns, hydrolyzed by HCl and enzyme hydrolysis (both β-glucosidase and an enzyme mixture). Analysis was by TLC with a Berthold TLC Scanner. The results of these analyses are tabulated below.

Metabolites		Residue (ppm) triazole label	phenyl label
Non-polar Metabolites	total	1.41	1.68
triadimenol (III)		1.04	0.90
KWG 1342 (VI)		0.28	0.46
triadimefon (I)		0.03	0.03
BUE 2285 (IV)		0.03	0.03
4-chlorophenol (VIII)		-	0.03
2 unknown metabolites			0.09
Polar Metabolites After acidic and enzymatic hydrolysis with β-glucosidase	total	1.04	0.40
KWG 1342-glucoside			
4-chlorophenylglucopyranoside (XVI)			
triadimenol-glucoside			
Non-extractable		1.00	0.81
Total residue		3.45	2.89

The non-extractable residue was 28-29% of the total residue 71 days after application. KWG 1342 is >10% of the total residue and should be included in the analysis of wheat and barley. The residue data submitted for wheat and barley in connection with PP#2F2665 included analysis for KWG 1342.

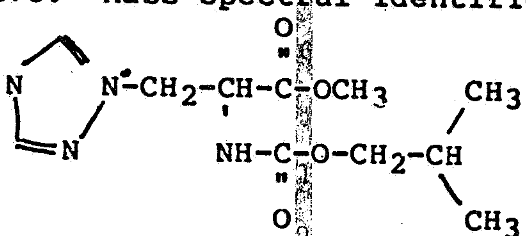
Report No. 80014, 9/4/81, R. Brennecke, "Bayleton Progress Report - Metabolism in Winter Wheat."

The distribution of radioactivity in various plant parts was studied. Results expressed in ppm Bayleton equivalent were as follows.

Plant part	phenyl label year 1 %	ppm	phenyl label year 1 %	ppm	triazole label year 1 %	ppm
Kernal	<0.1	0.01	0.2	0.02	9.8	0.84
Husk	97.6	6.68	0.3	0.11	1.8	0.52
Straw			92.8	5.07	80.2	3.57
Roots	2.4	1.11	6.7	2.14	8.2	3.05
Total	100	7.80	100	7.34	100	7.99

The major polar metabolite of straw was determined to be the hexose conjugate of triadimenol, probably triadimenol-β-D-glucopyranoside. It was identified by EI and CI mass spectrometry. An enzyme hydrolysis is planned for further identification.

BEB 217 was identified in the kernals, treated with triazole ring labeled triadimefon. BEB 217 is a triazolyl-alanine derivative. Mass spectral identification is being planned.



We defer to TOX to determine the significance of this metabolite. The final report should be submitted.

Report No. 80132, published, J. Rouchaud, C. Moons, and J. A. Meyer, "The Products of Metabolism in the Straw of Ripe Barley," <u>Bull. Environm. Contam. Toxicol.</u>, <u>27</u>, 543-550 (1981).

Two treatments of phenyl ring ^{14}C labeled triadimefon were made (0.44 lb ai/A). Triadimefon, free and conjugated triadimenol, and 4-chlorophenol were detected. No acid or enzyme hydrolysis was done. More than 65% of the residue was uncharacterized. This study will not be discussed further.

Report No. 66741, 9/11/78, revised 12/13/78, K. Vogeler, G. Timme, "Metabolism and Environmental Behavior of Triadimefon and Triadimenol."

This report should be reviewed by EAB as well as RCB. It includes behavior in soil, water, plants, and animals, and photochemical degradation.

This report summarizes earlier reports. It indicated that swine and poultry studies were in progress at the time of the report. We have no record of any swine studies being submitted. This study should be submitted.

Report No. 68125, 9/11/78, revised 12/13/78, K. Vogeler, G. Timme, "Metabolism and Environmental Behavior or Triadimefon and Triadimenol." This report is identical to Report No. 66741, described above.

Animal

Report No. 54132, 12/8/77. D. R. Fredrickson, "Interim Report on the Metabolism and Excretion of Bayleton in Rats." Rats were given a single oral dose of 25 mg/kg ^{14}C Bayleton. Only KWG 1323 was confirmed to be present (in urine).

Report No. 82560, 12/1/82, R. J. Puhl and D. R. Fredrickson, "The Metabolism of Bayleton-Benzene Ring-UL-^{14}C in a Rat Liver *in vitro* System." ^{14}C-Bayleton was incubated for one four in a buffered liver homogenate. The homogenate was extracted, analyzed by TLC, quantitated by liquid scintillation counting, and confirmed by GC/MS (Finnigan 1015). After one hour, 48% of the activity was unchanged Bayleton, 42% was Baytan (5% Isomer I, 37% Isomer II), and 10% was still in the aqueous phase. It was concluded that the initial products of the metabolism of Bayleton are the isomers of Baytan.

Analytical Methodology

The available enforcement method (PAM II) determines total Bayleton (Bayleton plus Baytan, KWG 1342, and KWG 1323) after hydrolysis to 4-chlorophenol. Samples are extracted with methanol. The extract is evaporated to dryness and cleaned up on an XAD-4 ion exchange column. The eluate is evaporated and the residue is hydrolyzed tc 4-chlorophenol, by refluxing with concentrated hydrochloric acid. The 4-chlorophenol is steam distilled, cleaned up by acid and base partitioning and derivatized with 2,4-dinitrofluorobenzene. Determination is by gas chromatography/mass spectrometry (GC/MS) using selected ion monitoring and an internal standard. A sucessful method trial has been performed (12/16/82, PP#1F2474/FAP#1H5292/PP#2F2665/FAP#2H5343/PP#2F2704, A. Smith).

Report No. 80488, 1/20/82, J. J. Obrist, W. M. Lumkuehler, M. W. Coffman, "Residue Analysis Procedure for BAYLETON and Metabolites in Barley and Wheat," revised 7/27/83. The unrevised method was submitted and reviewed in connection with PP#2F2665 and PP#3F2887 (9/9/82 and 9/12/83, A. Smith). The revised method was reviewed in connection with PP#4F3148/FAP#4H5443 (2/14/85, M. Firestone). It is currently undergoing a method trial. The method includes an enzyme hydrolysis to release conjugated residues. The trifluoroacetic anhydride (TFA) derivative is used for the gas chromatographic analysis of KWG 1342 and KWG 1323. (The KWG 1342 must be derivatized in order to be chromatographed. The KWG 1323 may be analyzed without derivatization.) Recovery data and sample chromatograms are included. The sample is blended in methanol/H_2O, and refluxed to solubilize additional extractables and filtered to remove solids. The solution is evaporated on a rotary evaporator to remove organic solvents. The remaining H_2O is buffered and enzymatically hydrolyzed to release conjugated residues. Residues are extracted with dichloromethane and cleaned up by Gel Permeation Chromatography (GPC) and Florisil column chromatography. The initial eluate (petroleum ether/ethyl ether) from the Florisil column is discarded. A more polar solvent (hexane/ethyl acetate) removes BAYLETON, KWG0519 and some KWG1323. A third fraction with an even more polar solvent (ethyl acetate/methanol) removes KWG1342 and more KWG 1323. The third fraction, containing KWG 1342 and KWG 1323, is derivatized with trifluoroacetic anhydride (TFA). The extracts are concentrated and analyzed by GC with nitrogen specific alkali flame detection. In the 7/27/83 revision, the procedure is modified to determine only Bayleton and KWG 0519 by omitting the GPC cleanup, the third fraction from the Florisil column (and the derivatization of the third fraction.

Report No. 49637, Published, W. Specht, "Gas-Chromatographic Method for Determining Residues of the Fungicides Fuberidazol, Fluotrimazole, and Triadimefon in Plants and Soil." Pflanzen-schutz-Nachrichten, 30, 55-77 (1977).

This report should be reviewed by EAB in addition to RCB.

The method determines triadimefon and the two diastereomeric form of its metabolite triadimenol. Samples are extracted with acetone with addition of water, depending on the water content of the sample, and partitioned into dichloromethane. The extract is cleaned up on a Florisil column. Analysis is by GC with a Nitrogen specific detector. For confirmation, at least 2 columns are used [OV1/QF1, SE-30, OV-101, and/or DC200(silylated)]. Limits of detection were reported to be 0.02-0.05ppm for plant material with >80% water, and 0.05-1.0 ppm for grain and straw.

Report No. 69810, 4/24/81, I Takase and Y. Yoshimoto, "Gas Chromatographic Method of Determining Residues of Triadimefon (Bayleton) and its Metabolite KWG 0519 in Plants and Soil."

This report should be reviewed by EAB as well as RCB.

Samples were extracted with acetone, and the solvent evaporated. The residue was partitioned between dichloromethane and water, cleaned up on a silica gel column, and two eluates collected. The elutes were dissolved in acetone and analyzed separately by GC with nitrogen specific flame ionization detection.

Recoveries were determined on a number of racs, and reported between 79 and 110% for triadimefon and KWG 0519. A calibration curve, representative chromatograms, and mass spectra were included.

Report No. 80715, 4/21/82, R. Brennecke, "Modifications in Residue Analysis Method F136. Separation of Interfering Plant Constituents by the Introduction of Additional Cleanup Steps." Three additional cleanup steps were added to method F136: acetonitrile/nhexane partition, acetonitrile/H_2O/dichloromethane partition, and silica gel cleanup. The method which was modified was W. Specht, M Tillkes, "Determination of Agro-chemical Residues after Cleanup by Gel-Chromatography and Mini-Silica Gel Column Chromatography," Pflanzenschutz-Nachrichten Bayer, 33, 61-65 (1980). A copy of method F136 was not supplied. Recoveries were reported in wheat. No data sheets or representative chromatograms were included.

Report No. 80717, G. Nickless, T. Spitzer, and J. A. Pickard, "Determination of Triadimefon in Grape Juice and Wine Using Capillary Gas Chromatography," J. Chromatogr., 208, 409-413 (1981). The grape juice or wine was passed through an XAD-2 column. Triadimefon and triadimenol residues were eluted with dichloromethane, and the solvent evaporated. The sample was reconstituted with ethanol and analyzed by GC-glass capillary OV-17 column, and flame ionization detection. Recoveries of triadimefon and triadimenol were reported to be 94% and 98%, respectively.

Report No. 80724, 1/1/82, R. Brennecke and K. Vogeler, "Method for the Gas Chromatographic Determination of Residues of Various Fungicides in Water."

This report should be reviewed by EAB, not RCB.

Report No. 85833, 2/17/83, K. Riegner, "Gas Chromatographic Separation of the Enantiomers of Triadimenol (Baytan), Determination of the Enantiomers of Triadimefon (Bayleton) after Reduction with Sodium Borohydride." Triadimefon exists as two enantiomers, (+) triadimefon (S-configuration), and (-) triadimefon (R-configuration). Upon reduction with sodium borohydride, S-triadimefon is converted to 1S-2R-triadimenol [(-)A-form (threo)] and 1S-2S-triadimenol [(+) B-form (erytheo)], and R-triadimefon is converted to 1R-2S-triadimenol [(+)A-form (threo)] and 1R-2R-triadimenol [(+)B-form (erythro)]. The isomers are analyzed by GC using the optically active stationary phase CHIRASIL-VAL. Triadimefon could not be separated into its optical antipodes on this column. However, the ratio of +/- forms could be calculated from the threo/erythro ratio of triadimenol, which could be separated on the CHIRASIL-VAL column. This method is interesting, because it shows that some enantiomers can be separated by GC. Generally, one of the optically active isomers is biologically active and the other is not. However, the active isomer is not identified here. This method should be held until it is needed.

Report No. 69028, 10/1/80, J. F. Kruplak, B. Bache, G. O. Breault, and J. P. Wargo, Jr., "Residue Analysis Procedure for the Determination of Bayleton and KWG 0519 in Poultry Tissues and Eggs." The method does not determine other metabolites of Bayleton. It will not be discussed further.

Storage Stability

Report No. 80338, 12/22/81, D. R. Fredrickson, "The Stability of BAYLETON and BAYTAN Residues in Wheat Forage During Frozen Storage." (previously submitted in PP#2F2665). Samples showed no decomposition after 299 days of frozen storage at -18°C. Analysis was by TLC with liquid scintillation counting detection.

Report No. 80568, 1982, L. K. Schiller, "The Effect of Frozen Storage at 0 to -10°F on BAYLETON and BAYTAN in Wheat Grain." (previously submitted with PP#2F2665) A sample with incurred residues was analyzed 120 days after the last application (presumably shortly after harvest) and again 14 months later (434 days) for BAYLETON and BAYTAN. The samples showed no decomposition.

Report No. 68929, 7/8/80, J. J. Obrist, "The Stability of Bayleton Residues in Rat Tissues Held in Frozen Storage." Liver and kidney samples and methanol extracts showed very little of no degradation following storage for three months at 0 to -10°F. Muscle and fat samples showed up to 25% degradation. Samples were analyzed for Bayleton, both forms of KWG 0519 and both forms of KWG 1342.

Recovery Data

Wheat and Barley

The following recoveries were reported for analytical method 80488 (with some changes), except for study number 69488, for which method 68646 was used.

Report No.	commodity		Bayleton	%Recovery KWG0519	KWG1342
82820 84207	Barley	forage	82-100	82-98	82-92
82873		grain	72-101	73-94	76-87
		straw	75-110	70-94	78-102
82821 84208	Wheat	forage	103-108	88-106	74-94
82874 69488		grain	76-102	76-98	75-92
		straw	76-78	80-106	76-97

Other crops

Recoveries were reported on other crops for analyses by method no. 54166 (December, 1977). Data sheets and sample chromatograms were included.

Report No.	commodity	% Recovery Bayleton	Baytan	KWG 1342
81077	apple, whole	86-100	90-92	
81077	apple, pulp	89-94	90-93	
81077	apple, peel	97-100	81-84	
68418	grapes	82	94	
81118	grapes	86	94	
67260	grass, forage	86-95	107-113	
67756	grass	103	97	
82848	grass, seed cleaning	75	92-99	76
82848	grass, straw	71	77	101
81131	pears	83-106	74-108	

Residue Data

The following residue data reports were received. Except for residue data on wheat and barley contained in Addition #2 (Accession No. 254696), none of the reports included the date of harvest, conditions of storage of samples prior to analysis, raw data sheets, or sample chromatograms. Samples were apparently stored six to ten months before analysis. These data cannot be validated without this information. Much of the residue data submitted reflected application at rates less than the maximum rate or PHI's greater than the minimum PHI.

Apples

Report No. 81078 (NY), 6/7/83. Two ground applications of Bayleton 50% WP were made (0.5 oz ai/100 gal x 400 gal/A). Two additional applications were made (1.0 oz ai/100 gal x 400 gal/A). A total of 20 oz ai/A/season was applied. This is less than the maximum of 32 oz ai/A/season. The total Bayleton residue was reported to be 0.24 ppm.

Report No. 80179 (CA), 6/7/83. Six ground applications of Bayleton 50% WP were made (1.0 oz ai/100 gal x 400 gal/A;

24 oz ai/A/season). The total Bayleton residue was reported to be 0.20 ppm.

Report No. 81080 (OR), 6/7/83. Eight ground applications of Bayleton 50% WP were made (1.0 oz ai/100 gal x 400 gal/A). A total of 32 oz ai/A/season was applied. The total Bayeleton residue was reported to be 0.07 ppm.

Report No. 81081 (MI), 6/7/83. Six ground applications of Bayleton 50% WP were made (2.0 oz ai/100 gal x 100 gal/A). Two additional applications were made (0.5 oz ai/100 gal x 400 gal/A). A total of 16 oz ai/A/season was applied. The pulp and peel of the apple were analyzed separately. The results are tabulated below.

PHI	Residue (ppm total Bayleton) pulp	peel	whole fruit
0	0.09	0.59	0.24
1	0.05	0.22	0.09
3	0.01	0.37	0.08
7	0.01	0.23	0.05

Report No. 81124 (NY), 3/2/83. Four aerial applications of Bayleton 50% WP were made (4 oz ai/A in 5 gal; 16 gal ai/A/season). The total Bayleton residue was reported to be 0.08 ppm.

Report No. 81125 (CA), 3/2/83. Four aerial applications of Bayleton 50% WP were made (4 oz ai/A in 10 gal; 16 gal ai/A/season). The total Bayleton residue was reported to be 0.09 ppm.

Report No. 81126 (OR), 3/2/83. Four aerial applications of Bayleton 50% WP were made (4 oz ai/A in 10 gal; 16 gal ai/A/season). The total Bayleton residue was reported to be 0.04 ppm.

Report No. 81127 (VA), 3/2/83. Four aerial applications of Bayleton 50% WP were made (4 oz ai/A in 100 gal; 16 gal ai/A/season). The total Bayleton residue was reported to be 0.05 ppm.

Report No. 81128 (CA), 3/2/83. One ground applications of Bayleton 50% WP was made (4 oz ai/A in 75 gal). Three additional ground applications were made (4 oz ai/A in 80 gal). A total of 16 gal ai/A/season was applied. The total Bayleton residue was reported to be 0.28 ppm.

Report No. 81129 (OR), 3/2/83. Five ground applications of Bayleton 50% WP were made (4 oz ai/A in 100 gal; 20 gal ai/A/season). The total Bayleton residue was reported to be 0.30 ppm.

Report No. 81130 (MI), 3/2/83. Three ground applications of Bayleton 50% WP were made (4 oz ai/A in 100 gal; 12 gal ai/A/season). The total Bayleton residue was reported to be 0.11 ppm.

All residues reported were less than the established tolerances. For most studies, however, the application rate was less than the maximum application rate.

Barley

Report No. 82826, 5/12/83, Residues of Bayleton in Barley (ND). Two aerial application of Bayleton 50% WP were made (2 oz ai/A), at the boot stage and at heading. This rate is well below the maximum registered rate. The total Bayleton residue was reported to be 3.82 ppm in forage, 0.12 ppm in grain, and 0.76 ppm in straw.

Report No. 82827, 5/12/83, Chemonics, "Residues of Bayleton in Barley (ID)." Two aerial applications of Bayleton 50% WP were made (4 oz ai/A), at the grain dough stage and the grain formation stage. Analysis was by method 80488 with modifications described in method 82820. The residue reported on green forage at a 0 day PHI was 9.29 ppm (below the 15 ppm tolerance). Grain and straw samples were taken with a 28 day PHI (greater than the minimum 21 day PHI). The total Bayleton residue was reported to be 0.16 ppm in grain and 1.41 ppm in straw.

Report No. 82825 (TX), 5/12/83. Three aerial applications of Bayleton 50% WP were made (8 oz ai/A in 2 gal). A total of 24 oz ai/A/season was made (3x rate). The residue reported in green forage (0 day PHI) was 33.88 ppm. The residue reported in the straw (21 day PHI) was 26.64 ppm Bayleton equivalent. These residues exceed the tolerance. However, Bayleton was applied at a 3x rate.

Report No. 82875. This report was listed in the table of contents but was not included. Report No. 82975 (Amaze on potatoes) was included instead. Report No. 82875 should be submitted.

Cucumbers

Report No. 81192 (MI), 2/2/83. Three ground applications of Bayleton 50% WP were made (2 oz ai/A in 100 gal; 6 oz ai/

season). This is close to the maximum application of 8 oz ai/A/ season. No residue of Bayleton or KWG 0519 was reported.

Grapes

Report No. 81119 (CA), 1/5/83. Three aerial applications of Bayleton 50% WP were made (3 oz ai/A in 10 gal; 9 oz ai/A/ season). No residue of Bayleton was reported at a PHI of 15 days. A residue of 0.01 ppm KWG 0519 was reported. This is well below the tolerance of 0.3 ppm.

Report No. 81120 (WA), 1/5/83. Three aerial applications of Bayleton 50% WP were made (3 oz ai/A in 10 gal; 9 oz ai/A/ season). No residues of Bayleton or KWG 0519 were reported at a PHI of 14 days.

Report No. 81121 (NY), 1/5/83. Three aerial applications of Bayleton 50% WP were made (3 oz ai/A in 5 gal; 9 oz ai/A/ season). Residues of Bayleton and KWG 0519 were reported as 0.03 and 0.06 ppm, respectively. This residue is well below the established tolerance.

Grass

Report No. 68196 (KS), 9/6/79. The application rate was not given. The total Bayleton residue in the grass was reported to be 4.85 ppm (2 day PHI).

Report No. 82854 (OR), 5/12/83. Seven ground applications of Bayleton 50% WP were made (2.0 oz ai/A in 40 gal; 14 oz ai/A/ season). The PHI was 6 days, longer than the minimum 5 day PHI. The total Bayleton residue was reported to be 15.47 ppm in the seed cleanings and 7.09 ppm in the straw.

Report No. 82855 (OR) 5/12/83. Three ground applications of Bayleton 50% WP were made (4.0 oz ai/A in 40 gal; 12 oz ai/A/ season). The PHI was 6 days, longer than the minimum 5 day PHI. The total Bayleton residue was reported to be 28.08 ppm in the seed cleanings and 10.44 ppm in the straw.

Report No. 82856 (OR), 5/12/83. One ground application of Bayleton 50% WP was made (8.0 oz ai/A in 20 gal; 8 oz ai/A/ season). The PHI was 27 days, longer than the minimum 5 day PHI. The total Bayleton residue was reported to be 23.03 ppm in the seed cleanings and 26.81 ppm in the straw.

Report No. 82857 (OR), 5/12/83. Two ground applications of Bayleton 50% WP were made (8.0 oz ai/A ; 16 oz ai/A/season). The PHI was 16 days, longer than the minimum 5 day PHI. The total Bayleton residue in the straw was reported to be 9.58 ppm.

Report No. 82858 (OR), 5/12/83. Two ground applications of Bayleton 50% WP were made (8.0 oz ai/A ; 16 oz ai/A/season). The PHI was 16 days, longer than the minimum 5 day PHI. The total Bayleton residue was reported to be 8.98 ppm in the seed cleanings and 10.22 ppm in the straw.

All residues reported on grass, grass seed cleanings, and grass straw were reported to be less than the established tolerances.

Pears

Report No. 81132 (NY), 3/2/83. Four aerial applications of Bayleton 50% WP were made (4.0 oz ai/A in 5 gal; 16 oz ai/A/season). A total residue of 0.21 ppm Bayleton plus KWG 0519 was reported.

Report No. 81133 (CA), 3/2/83. Four aerial applications of Bayleton 50% WP were made (4.0 oz ai/A in 10 gal; 16 oz ai/A/season). A total residue of 0.05 ppm Bayleton plus KWG 0519 was reported.

Report No. 81134 (OR), 3/2/83. Four aerial applications of Bayleton 50% WP were made (4.0 oz ai/A in 10 gal; 16 oz ai/A/season). A total residue of 0.14 ppm Bayleton plus KWG 0519 was reported.

Report No. 81135 (NY), 3/2/83. Four ground applications of Bayleton 50% WP were made (4.0 oz ai/A in 59 gal; 16 oz ai/A/season). A total residue of 0.23 ppm Bayleton plus KWG 0519 was reported.

Report No. 81136 (CA), 3/2/83. Four ground applications of Bayleton 50% WP were made (4.0 oz ai/A in 80 gal; 16 oz ai/A/season). A total residue of 0.43 ppm Bayleton plus KWG 0519 was reported.

Report No. 81137 (OR), 3/2/83. Five ground applications of Bayleton 50% WP were made (4.0 oz ai/A in 100 gal; 20 oz ai/A/season). A total residue of 0.40 ppm Bayleton plus KWG 0519 was reported.

Report No. 81138 (MI), 3/2/83. Four ground applications of Bayleton 50% WP were made (3.75 oz ai/A in 75 gal; 15 oz ai/A/season). A total residue of 0.70 ppm Bayleton plus KWG 0519 was reported.

All of the residues reported on pears were below the established tolerances, even though application was made at slightly more than the registered rate.

Squash

Report No. 81177 (OR), 2/2/83. One ground application of Bayleton 50% WP was made (2 oz ai/A in 40 gal). Two ground applications were made (1 oz ai/A in 40 gal). Two additional ground applications were made (2 oz ai/A in 40 gal). A total of 8 oz ai/A/season was applied. A total residue of 0.17 ppm Bayleton plus KWG 0519 was reported.

Report No. 81178 (FL), 2/2/83. Three ground applications of Bayleton 50% WP were made (2.0 oz ai/A in 100 gal; 6 oz ai/A/ season). A total residue of 0.03 ppm Bayleton plus KWG 0519 was reported.

The residues of Bayleton from these two trials are less than the 0.03 ppm tolerance.

Wheat

Report No. 82822, 5/12/83, Chemonics, "Residues of Bayleton in Wheat (ND)." Two aerial applications of Bayleton 50% WP (4 oz ai/A) were made at boot stage and at heading. Analysis was by method 80488. These data show residues well below the established tolerance.

Report No. 82824, 5/12/83, Chemonics and Morse Laboratories, "Residues of Bayleton in Wheat (MT)." Two aerial applications of Bayleton 50% WP (4 oz ai/A) were made at grain dough and grain formation stages. Analysis was by method 80488 with modifications described in methods 82821 and 82874. These data show residues well below the established tolerance. However, the PHI for the grain and straw samples was 27 days (longer than the minimum 21 day PHI).

Report Nos. 82876 (ONT), 4/29/83. A single ground application of Bayleton 50% WP was made (2 oz ai/A). This is much less than the maximum application rate. The total Bayleton residue was reported to be 0.04 ppm in the grain and 0.29 ppm in the straw (27 day PHI).

Report Nos. 82877 (OR), and 82878 (OR), 4/29/83. A single application of Bayleton 50% WP was made (2 oz ai/A). This is much less than the maximum application rate. The PHI (57 days) was much longer than the 21 day minimum PHI. No residue was reported in the grain.

The residues of Bayleton from the two trials at the maximum application rate (ND and MT) are well below the established tolerances.

Grape Juice and Wine

Report No. 80717, G. Nickless, T. Spitzer, and J. A. Pickard, "Determination of Triadimefon in Grape Juice and Wine using Capillary Gas Chromatography," J. Chromatogr., 208, 409-413, (1981). Six applications of Bayleton were made in a 0.0025% ai spray applied to runoff. PHI's of 8 and 21 days were used. The minimum PHI is 14 days, so only the data with the 8 day PHI will be considered. Residues reported in the grape juice were 0.024 and 0.077 ppm triadimefon and triadimenol, respectively. Residues reported in the wine were <0.005 and 0.030 ppm triadimefon and triadimenol respectively. Recovery at 0.1 ppm was reported to be 94% and 98% for triadimefon and triadimenol, respectively. No indication was made if these were single values or averaged data.

Processing Studies

Report No. 66099, 6/9/78, J. S. Thornton and J. J. Obrist, "Effect of Processing on Residues of Bayleton in Apples." Ten applications of Bayleton 50% WP were made at the rate of 2 oz/100 gal, sprayed to runoff. Samples were reportedly collected after the last application on 10/6/77, and held in cold storage (35°F) for three weeks before processing. Processing was done on the unwashed fruit. The residues on control samples were all reported to be <0.01 ppm. Residues on treated samples were reported as follows:

	Residue (ppm)		
	Bayleton	KWG 519	Total
pulp, unwashed	0.02	0.03	0.05
peel, unwashed	1.16	0.20	1.36
whole fruit (calculated)			0.23
pulp, washed	0.01	0.03	0 04
peel, washed	0.52	0.18	0.70
whole fruit (calculated)			0.12
juice	0.05	0.02	0.07
wet pomace	0.62	0.30	0.92
dry pomace	0.20	0.25	0.45

These data show the reduction of residue from washing the fruit, and the concentration of residues in apple pomace.

Report No. 68861, 8/27/80, B. D. Becker, "Processing Study of Grapes (Thompson seedless)." Three applications of Bayleton 50% WP were made at an unspecified rate. Residues in raisins and raisin trash were reported. Storage conditions, residues in unprocessed grapes, and grape pomace were not reported. Without this information, no conclusions can be drawn from this study.

Report No. 69449, 11/18/81, K. D. Strankowski, "Wheat Processing Study." Samples were analyzed only for Bayleton and Baytan, not for KWG 1342 and KWG 1323. The samples were reanalyzed and results were reported in a later report. This early study is not useful.

Report No. 69450, 4/22/81, W. M. Leimkuefler and A. H. Kadoum, "Effect of Dry Milling on Bayleton and Baytan." This report summarized raw data in Report Nos. 69448 and 69449, which were not included in this submission. The data were averaged. The storage conditions were not specified. This report is not useful.

Meat, Milk, Poultry, and Eggs

Report No. 69208, 12/8/80, J. F. Kruplak, B. Bache, G. O. Breault, J. P. Wargo, Jr., Residues of Bayleton and the Metabolite KWG 0519 (Baytan) in Poultry Hens Fed and Equal Mixture of the Two Compounds." Residues of KWG 1323 and KWG 1342 were not reported, so this study is not useful. (Total Bayleton residues reported are considerably less than those reported in PP#2F2665 (9/9/82, A. Smith).)

cc: R.F., circu, S. Hummel, Bayleton S.F., Bayleton Amended Use File
RDI:EZ:2/15/84:RDS:2/15/85
TS-769:RCB:SVH:svh:CM#2:RM810:2/15/85:x73043

Attachments: Appendices I and II

Data in Accession Number 254696

Report No. 80293, J. G. Morgan and M. F. Lenz, 1982, "Metabolism of Bayleton in Wheat"

Report No. 80338, D. R. Frederickson, 12/22/81, "The Stability of Bayleton and Baytan Residues in Wheat Forage During Frozen Storage."

Report No. 80488, J. J. Obrist, W. M. Lumkuehler, M. W. Coffman, 1/20/82, "Residue Analysis Procedure for Bayleton and Metabolites in Barley and Wheat, Revised 7/27/83".

Report No. 80568, L. K. Schiller, 1982, "The Effect of Frozen Storage at 0 to -10°F on Bayleton and Baytan in Wheat Grain."

Report No. 82820, 1983, Chemonics, "Recovery of Bayleton from Barley."

Report No. 82821, 1983, Chemonics, "Recovery of Bayleton from Wheat."

Report No. 82874, 1983, Morse Laboratories, "Recovery of Bayleton from Wheat."

Report No. 84207, 1983, Chemonics, "Recovery of Bayleton from Barley."

Report No. 84208, 1983, Chemonics, "Recovery of Bayleton from Wheat."

Report No. 82826, 5/12/83, Chemonics, "Residues of Bayleton in Barley (ND)."

Report No. 82827, 5/12/83, Chemonics, "Residues of Bayleton in Barley (ID)."

Report No. 82822, 5/12/83, Chemonics, "Residues of Bayleton in Wheat (ND)."

Report No. 82824, 5/12/83, Chemonics and Morse Laboratories, "Residues of Bayleton in Wheat (MT)."

Data in Accession No. 254698

Metabolism Reports

Animals

Report No. 54132, 12/8/77, D. R. Fredrickson, "Interim Report on the Metabolism and Excretion of Bayleton in Rats."

Report No. 82560, 12/1/82, R. J. Puhl and D. R. Fredrickson, "The Metabolism of Bayleton-Benzene Ring-UL-14C in a Rat Liver *in vitro* System."

Crop

Report No. 67061, 10/19/77, K. Vogeler, "Second Report, The Metabolism of ^{14}C Bayleton in Summer Barley and Soil and in Rotational Crops."

Report No. 68626, 11/13/79, K. Vogeler, R. Brenneke, "Status of the Studies on the Soil Metabolism of Bayleton Applied on Summer Barley Using [Triazole Ring-3,5-^{14}C] and [Benzene Ring-U-^{14}C] Triadimefon."

Report No. 68645, 11/7/79, K. Vogeler, R. Brennecke, "Studies on the Metabolism of Triadimefon in Summer Wheat and in Soil after Application of ^{14}C Bayleton on Summer Wheat."

Report No. 68720, 11/15/79, K. Vogeler, W. Steffens, "Supplementary Accountability Tests Using [Benzene ring U-^{14}C] Triadimefon after Spray Treatment of Summer Wheat in Field Lysimeters with Undisturbed Soil Profiles."

Report No. 68793, 5/20/80, R. Brennecke, K. Vogeler, "Status of the Studies on the Metabolism of Triadimefon in Straw of Summer Barley after Application of [Triazole ring 3,5-^{14}C] and [phenyl-UL-^{14}C] Bayleton on Summer Barley."

Report No. 80014, 9/4/81, R. Brennecke, "Bayleton Progress Report - Metabolism in Winter Wheat."

Report No. 80132, published, J. Rouchaud, C. Moons, and J. A. Meyer, "The Products of Metabolism of ^{14}C Triadimefon in th Grain and in the Straw of Ripe Barley," Bull. Environm. Contam. Toxicol., 27, 543-550 (1981).

Soil

Report No. 66741, 9/11/78, Revised 12/13/78, K. Vogeler, G. Timme, "Metabolism and Environmental Behavior of Triadimefon and Triadimenol."

Report No. 68125, 9/11/78, Revised 12/13/78, K. Vogeler, G. Timme, "Metabolism and Environmental Behavior of Triadimefon and Triadimenol." (identical to Report #66741)

Residue Reports

Apples

Report Nos. 81078, 81079, 81080, 81081, 6/7/83.

Report Nos. 81124, 81125, 81126, 81127, 81128, 81129, 81130, 3/2/83.

Barley

Report No. 82825, 5/12/83.

Report No. 82975, 5/25/83, Residue Data for Amaze on Potatoes. (wrong chemical-according to Table of Contents, Report No. 82875 is included)

Cucumbers
Report No 81192, 2/2/83.

Grapes
Report Nos. 81119, 81120, 81121, 1/5/83.

Grass
Report No. 68196, 9/6/79.

Report Nos. 82854, 82855, 82856, 82857, 82858, 5/12/83.

Pears
Report Nos. 81132, 81133, 81134, 81135, 81136, 81137, 81138, 3/2/83, Residue Data on Pears.

Rotational Crops
Report No. 69811, 6/5/81, I. Takase and Y. Yoshimoto, "The Assimilation and Residues of Triadimefon by Rotational Crops."

Report No. 69812, 6/15/81, Y. Yoshimoto and I. Takase, "Residues of Triadimefon (Bayleton) in Rotational Crops."

Soil
Report No. 80702, 4/7/82, Soil Persistence Study.

Squash
Report Nos. 81177, 81178, 2/2/83.

Wheat
Report Nos. 82876, 82877, 82878, 4/29/83.

Recovery Reports
Apples
Report No. 81077, 4/1/82.

Barley
Report No. 82873, 2/2/83.

Grapes
Report No. 68418, 11/12/79.

Report No. 81118, 12/9/82.

Grass
Report No. 67756, 6/21/79.

Report No. 67260, 3/23/79.

Report No. 69093, 9/6/79.

Report No. 82848, 4/23/83.

Pears
Report No. 81131, 1/6/83.

Wheat
Report No. 69448, 11/18/81.

Patch, Glove and Filter
Report No. 80296, 12/14/81, J. S. Thornton, "Recovery of Bayleton from Patches, Gloves and Filter Materials."

Soil
Report No. 67658, 5/3/79, S. S. Nichols, "Recovery of Bayleton from Soil."

Report No. 67755, 6/21/79, S. S. Nichols, "Recovery of Bayleton from Soil."

Report No. 69237, 1/19/81, R. A. Morris, "Recovery of Bayleton and Baytan from Soil."

Stability Reports
Report No. 49461, 7/12/76, Dr. Sch/Rh, "MEB6447 and KWG0519 - Stability in Soil."

Report No. 68929, 7/8/80, J. J. Obrist, "The Stability of Bayleton Residues in Rat Tissues Held in Frozen Storage."

Processing Reports
Report No. 66099, 6/9/78, J. S. Thornton, J. J. Obrist, "Effect of Processing on Residues of Bayleton in Apples."

Report No. 68861, 8/27/80, B. D. Becker, Processing Study of Grapes (Thompson seedless).

Report No. 69449, 11/18/81, K. J. Strankowski, Wheat Processing Study.

Report No. 69450, 4/22/81, W. M. Leimkuehler and A. H. Kadoum, "Effect of Dry Milling on Bayleton and Baytan."

Flavor Reports
Report No. 53782, 9/29/77, L. A. McGill, "Flavor Evaluation of Apples and Applesauce."

Report No. 66153, 6/7/78, R. L. LaBelle, "Flavor Evaluation of Apples."

Report Nos. 67763 and 67764, 6/20/79, S. S. Nichols, "Flavor Evaluation of Grapes."

Report No. 68192, 9/13/79, R. A. Morris, "Flavor Evaluation of Grape Wine."

Feeding Reports
Report No. 69208, 12/8/80, J. F. Kruplak, B. Bache, G. O. Breault, J. P. Wargo, Jr., "Residues of Bayleton and the

Metabolite KWG0519 (Baytan) in Poultry Hens Fed an Equal Mixture of the Two Compounds."

Physical Chemistry Reports

Report No. 45323, 10/7/75, K. Vogeler, "Pesticide Residues in the Leachate."

Report No. 67356, 8/7/78, Rolf Wilmes, "Experiments on the Photochemical Degradation of MEB 6447, MEB 6449, and KWG 0519."

Reentry

Report No. 82584, 7/19/82, A. Inkmann-Koch, R. Stegh, "Studies on the Determination of Applicator Exposure in the Application of Bayleton on Grain."

Method Reports

Animal

Report No. 69028, 10/1/80, J. F. Kruplak, B. Bache, G. O. Breault, and J. P. Wargo, Jr., "Residue Analysis Procedure for the Determination of Bayleton and KWG0519 in Poultry Tissues and Eggs."

Crop

Report No. 49637, published, W. Specht, "Gas Chromatographic Method for Determining Residues of the Fungicides Fuberidazol, Fluotrimazole, and Triadimefon in Plants and Soil," Pflanzenschutz-Nachrichten, 30, 55-71 (1977).

Report No. 69810, 4/24/81, I. Takase and Y. Yoshimoto, "Gas Chromatographic Method of Determining Residues of Triadimefon (Bayleton) and its Metabolite KWG0519 in Plants and Soil."

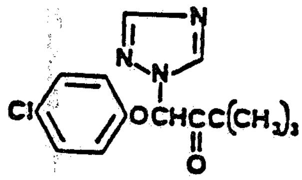
Report No. 80715, 4/21/82, R. Brennecke, "Modifications in Residue Analysis Method F136. Separation of Iterfering Plant Constituents by the Introduction of Additional Cleanup Steps."

Report No. 80717, published, G. Nickless, T. Spitzer, and J. A. Pickard, "Determination of triadimefon in Grape Juice and Wine using Capillary Gas Chromatography," J. Chromatogr, 208, 409-413 (1981).

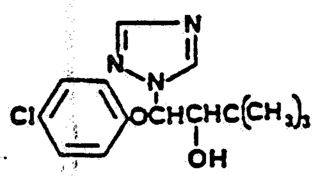
Report No. 80724, 1/1/82, R. Brennecke and K. Vogeler, "Method for the Gas Chromatographic Determination of Residues of Various Fungicides in Water."

Miscellaneous

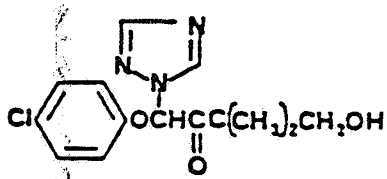
Report No. 85833, 2/17/83, K. Riegner, "Gas Chromatographic Separation of the Enantiomers of Triadimenol (Baytan), Determination of the Enantiomers of Triadimefon (Bayleton) after Reduction with Sodium Borohydride."



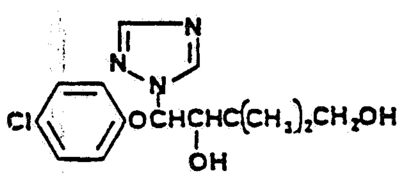
triadimefon (Bayleton) 1-(4-chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone



triadimenol (Baytan) 1-(4-chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanol



KWG 1323 1-(4-chlorophynoxy)-3-hydroxymethyl-3-methyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone



KWG 1342 4-(4-chlorophenoxy)-2,2-dimethyl-4-(1H-1,2,4-triazol-1-yl)-1,3-butadiol