

US EPA ARCHIVE DOCUMENT

109901  
SHAUGHNESSEY NO.

13  
REVIEW NO.

EEB BRANCH REVIEW

DATE: IN 11-12-80 OUT 11-26-80

FILE OR REG. NO. \_\_\_\_\_  
PETITION OR EXP. PERMIT NO. 3125 - EUP - RTL (1G2432)  
DATE DIV. RECEIVED 11-10-80  
DATE OF SUBMISSION 10-27-80  
DATE SUBMISSION ACCEPTED \_\_\_\_\_  
TYPE PRODUCT(S): I, D, H, (F), N, R, S Fungicide - Rust and Mildew  
DATA ACCESSION NO(S). \_\_\_\_\_  
PRODUCT MANAGER NO. H. Jacoby (21)  
PRODUCT NAME(S) Bayleton 50% Wettable Powder  
COMPANY NAME Mobay Chemical Corporation  
SUBMISSION PURPOSE Proposed EUP for barley and wheat

SHAUGHNESSEY NO.	CHEMICAL, & FORMULATION	% A.I.
<u>109901</u>	<u>Triadimefon 1-(4-Chlorophenoxy)-3,3-dimethyl</u>	
	<u>-1-(1H-1,2,4-triazol-1-yl)-2-butanone</u>	<u>50.0 %</u>

Triadimefon

100 Experimental Use Label Information

100.1 Pesticide Use

The control of rusts and powdery mildew on wheat and barley.

100.2 Formulation Information

1. Triadimefon -- 50.0 %
2. Wettable Powder

100.3 Application Methods, Directions, Rates

(See Enclosure 1)

100.4 Target Organism(s)

1. Powdery mildew
2. Rusts (stripe, leaf, and stem)
3. Leaf and glume blotch ---- Septoria tritici and S. nodorum
4. Stripe -- Cephalosporium gregatum

100.5 Precautionary Labeling

No additional precautions were mentioned on the supplemental labeling (enclosure 1).

The original labeling precautions reported in Leitzke's 2-7-80 review are as follows:

Environmental Hazards

Do not use on other crops grown for food or forage. Keep out of lakes, streams, ponds. Do not contaminate water by cleaning of equipment or disposal of wastes. Apply this product only as specified on this label. Do not make applications when weather conditions favor drift from target area.

100.6 Proposed EUP Program

100.6.1 Objectives

To obtain data from tests conducted under commercial use conditions in order to determine the efficacy of triadimefon for control of certain diseases which infect wheat and barley.

100.6.2 Date, Duration

This request is for a 2-year permit effective from January 1, 1981 until December 31, 1982.

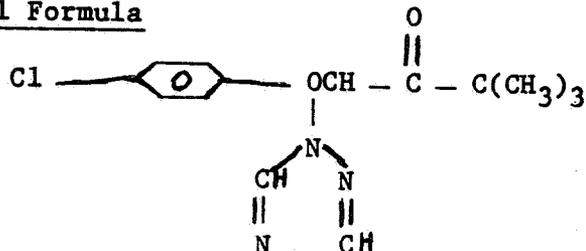
100.6.3 Amount Shipped, Geographical Distribution

A total of 3,350 pounds of Bayleton 50% W.P. (1675 pounds active) is requested for use on 3350 acres. This acreage figure takes into account the acres treated in year one and year two of the EUP.

<u>STATE</u>	<u>ACRES/YEAR</u>		<u>SUPERVISORS</u>
	<u>1st</u>	<u>2nd</u>	
Nebraska	-	150	L. R. Cobia
North Dakota	150	150	G. L. Schroeder
Arkansas	100	100	D. K. Glover
Virginia	-	100	S. M. Woodall
Georgia	100	100	J. R. Collins
New York	150	150	R. H. Ackerman
Pennsylvania	150	150	E. A. Cunningham
New Jersey	-	150	P. M. Grehlinger
Illinois	100	100	W. W. DeWeese
Michigan	-	100	S. P. Prest
Indiana	-	100	J. F. Smith
Ohio	-	100	J. O. Olson
Texas	100	100	R. P. Hayne
			M. W. Phillips
			J. M. Martinez
Oklahoma	100	100	J. E. Cagle
Washington	150	150	H. L. Ramsey
Oregon	150	150	C. E. Joplin
Idaho	-	150	H. L. Ramsey
			L. L. Barthleman

101 Chemical and Physical Properties (from Leitzke's review 2/7//80)101.1 Chemical Name:

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

101.2 Common Name: Triadimefon (BAY 8364, MEB 6447)101.3 Structural Formula

Molecular Weight: 293.7

101.5 Physical State

White to tan crystals; odorless to mild aromatic.

101.6 Solubility

Water - 260 ppm at 20°C  
 Cyclohexanone - 35 %  
 Toluene - 25 %  
 Isopropanol - 17 %  
 Methylene Chloride >50 %  
 Ligroin - 25 %

102 Behavior in the Environment (from Leitzke's review 2/7/80)

(Reference: Expanded from L. Turner's (1/12/79) citation of K. Sampson/R. E. Ney - Environmental Fate Review, 8/8/78).

102.1 Soil

In laboratory studies, the half-life of triadimefon was six days in aerobic soil and 15 days in anaerobic soil. Since there was no degradation in sterile soils, microbial action on triadimefon seems a likely route of degradation. In field studies the average half-life was five days, but the half-life of triadimefon plus its primary degrade (KWG-0519) was 225 days. KWG-0519 is considered persistent.

"Aged" soil residues of triadimefon were substantially mobile in sandy clay loam and silty clay soils in column leaching and soil TLC experiments. In the column part, 73% of the original <sup>14</sup>C activity was found below 5 cm. However, relatively low leaching ability of "fresh" triadimefon was noted in a different soil TLC study. Lack of experimental procedures prevented ascribing different results to aging or use of differently labeled parent compounds.

102.2 Water

Triadimefon is stable to hydrolysis at pH 3, 6, and 9 and temperatures of 25°C, 35°C, and 45°C. It will photolyze in water with a half-life of 10-12 hours. Addition of 2% acetone accelerated the half-life to 5.5 hours. 1,2,4-Triazole and CO<sub>2</sub> were the major photoproducts from triazole- and benzene ring-labeled studies.

In a simulated pond environment, triadimefon has a half-life of 6-8 days in the water and 18-20 days in the silt. The major degradate was again KWG-0519.

102.3 Soil Microorganisms

There is little inhibition of several soil microbes by triadimefon. However, when nitrogen-fixing symbionts in soybean nodules were exposed to 0.5 ppm triadimefon for four weeks, the plants showed a 60% decrease in shoot length, 21% decrease in plant flesh weight and

29% decrease in nodule fresh weight as compared to controls. On the other hand, actual nitrogen-fixation (as measured by acetylene reduction on LC) was not affected.

102.4 Plant

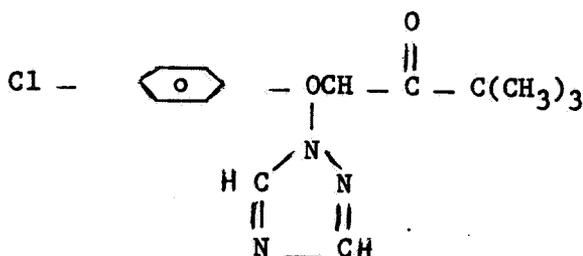
In barley plants and seeds, KWG-0519 is again the primary metabolite.

102.5 Animal

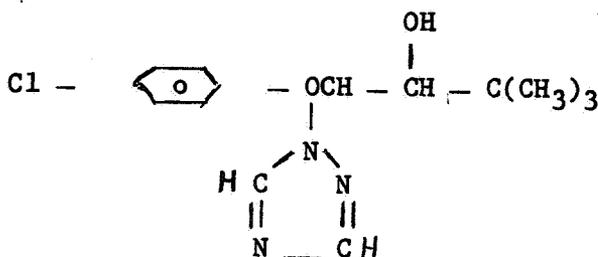
Triadimefon accumulated in 28 days in catfish to levels of 6.5-7.6X in two flow-through tests at 10 and 100 ppb. Approximately 96% of activity was eliminated in the first seven to ten days of withdrawal.

102.6 Comparative Structural Formulas

Parent: Triadimefon



Primary Degradate: KWG-0519 (*Bayfan 127201*)



103 Toxicological Properties (from Leitzke's review 2/7/80)103.1 Mammal

(Reference: Toxicology Branch memo by J. D. Doherty, 2/15/78).

## Acute Oral LD50

<u>Species</u>	<u>Formulation</u>	<u>LD50 (mg/kg)</u>
Rat (male)	92 % Technical	568 mg/kg
Rat (female)	92 % Technical	363 mg/kg
Mouse (male)	92 % Technical	987 mg/kg
Mouse (female)	92 % Technical	1071 mg/kg
Rabbit	Technical	500 mg/kg
Dog	Technical	500 mg/kg
Rat (male)	50 % WP	812 mg/kg
Rat (female)	50 % WP	1470 mg/kg
Rat (male)	25 % WP	2828 mg/kg
Rat (female)	25 % WP	3668 mg/kg

## Teratology

Three studies (oral in rats, inhalation in rats, and oral in rabbits) showed no indication of embryo toxicity or teratogenesis at 50 mg/kg.

103.2 Fish and Wildlife (Combined from previous EEB reviews)

<u>Species</u>	<u>Test Type</u>	<u>Formulation</u>	<u>Toxicity</u>	<u>Status</u>
Mallard	Acute Oral LD50	Technical	>4,000 mg/kg	Core
Mallard	Dietary LC50	Technical	>10,000 ppm	Core
Bobwhite	Dietary LC50	Technical	>4,640 ppm	Core
Bluegill	96-Hour LC50	Technical	11 ppm	Core
Rainbow Channel Catfish	96-Hour LC50	Technical	14 ppm	Core
<u>Daphnia</u> <u>magna</u>	48-Hour EC50	Technical	1.6 ppm	Core

103.3 Beneficial InvertebratesHoney Bees (Apis mellifera)

Contact and oral LD50 --- both greater than 25 ug/bee.  
Stevenson. 1978. Plant Pathol. 27(1):38-40.

Reviewed by: A. Vaughan, 11/5/79

Reviewer's conclusions: This study is scientifically sound.

## Worms

A previous EEB review by J. Tice (4/19/78) cited a study on manure worms (Eisenia foetida) by Hermann, 1973. Members of the genus Eisenia are commonly called manure worms because they require manure to live in. Members of this genus are the worms that are usually sold by commercial operators because they reproduce faster and year-round as opposed to Lumbricus terrestris. Manure worms, e. g., E. foetida, are also very resistant to a number of pesticides that are quite toxic to L. terrestris, and thus the use of manure worms "is quite unwise if the results are to be applied to other earthworms" (Stickel, W. H., in Foreword to Davey, S.P. 1963. Effects of chemicals on earthworms: A review of the literature. Bur. Sport Fish. Wildl., Spec. Sci. Rep. - Wildl. No. 74; see also Gilman, A. P. and A. Vardanis. 1974. Carbofuran. Comparative toxicity and metabolism in the worms Lumbricus terrestris L. and Eisenia foetida S. J. Agric. Food Chem. 22(4):625-628.

104 Hazard Assessment

## 104.1 Discussion

The recommended application rate for powdery mildew for wheat or barley is 1 to 2 oz. of active ingredient per acre. For rust a higher rate of 2 to 4 oz. of active ingredient per acre is recommended. Regardless of the crop, the maximum amount of active ingredient applied per acre per crop season is 8 ounces.

## 104.2 Likelihood of Adverse Effects to Non-target Organisms

The primary degradate of triadimefon, KWG 0519, is potentially at least as toxic as the parent material (Yamhure, 3/31/80). Hence, the following maximum expected residues were derived using the application rate of 8 ounces:

<u>Material</u>	<u>Residues from 8 oz. a.i.</u>	
Long grass	55.0	ppm
Leaves and leafy crops	62.5	ppm
Forage (alfalfa, clover, grain)	29.0	ppm
Pod containing seeds	6.0	ppm
Fruit (cherries, peaches)	3.5	ppm
Water (6 inch deep layer)	0.367	ppm

In view of the above estimates, little, if any, acute hazard is expected from the use of Bayleton®. However, the persistence of the degradate may result in chronic and reproductive effects. Similar to Gessner's (6/6/80) and Yamhure's (3/3/80) reviews chronic exposure to birds would be expected in and around wheat and barley fields. Hence, reproductive studies are indicated.

## 104.3 Endangered Species Considerations

The representative species used in the toxicity studies indicate minimal hazard at the proposed label rates, particularly considering the minimum

amount of acreage to be treated.

105 Conclusions

105.3 Data Adequacy Conclusions

The six basic fish and wildlife requirements have been submitted and found adequate to support registration.

105.4 Data Requests

Prior to consideration of registration, the following data are required:

- 1) Two Daphnia life-cycle studies: one study with technical triadimefon and the other with triadimefon aged long enough to insure a high concentration of KWG-0519. *(Triadimefon on Bayou #1272)*
- 2) Avian reproduction studies on KWG-0519 or the technical material for both an upland game species (preferably bobwhite quail or ringed-neck pheasant) and a waterfowl species (preferably the mallard duck).

105.6 Recommendations

The Ecological Effects Branch does not object to the proposed Experimental Use Permit on wheat and barley.

Dennis J. McLane *Dennis J. McLane 11-22-80*  
Section 1, Ecological Effects Branch, HED

*Ray Matheny 11/20/80*  
Ray Matheny, Section Head  
Section 1, Ecological Effects Branch, HED

*Clayton Bushong 11/20/80*  
Clayton Bushong, Branch Chief  
Ecological Effect Branch, HED