109901
SHAUGHNESSEY NO.

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REVIEW NO.

EEB BRANCH REVIEW

DATE: IN 11/18/81 OUT 1/5/82

FILE OR REG. NO. 3125 - 320

PETITION OR EXP. PERMIT NO. 1H5232

DATE OF SUBMISSION 1/27/81

DATE RECEIVED BY HED 11/18/81

RD REQUESTED COMPLETION DATE 1/28/82

EEB ESTIMATED COMPLETION DATE

RD ACTION CODE/TYPE OF REVIEW 330/Amendment - New Food Use

TYPE PRODUCT(S): I, D, H, F, N, R, S Fungicide

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 Conditional Registration of Uses On Apples, Grapes and Seed Grass

SHAUGHNESSEY NO.	CHEMICAL, & FORMULATION	% A.I.
109901	Triadimefon	50%

Bayleton

100.1 Pesticide Use

Bayleton 50% wettable powder will be used for the control of various plant diseases in grapes, apples and grass grown for seed.

100.2 Formulation

Triadimefon (Bayleton®) -- 50.0% wettable powder

100.3 Application rates, methods

Crop	as Rate (product)	Number of Applications
Grapes*	2-6 oz/A	as needed
Apples*	2-4 oz/A	as needed
Grass*	8-16 oz/A	2 lbs max. year

*= ground or air
**= ground

See attached labels for details.

100.4 Precautionary Labeling

The main Bayleton label to which these uses will be added was not submitted.

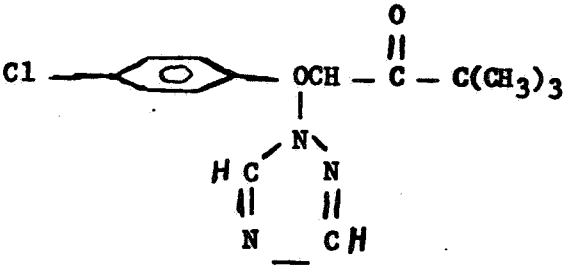
101 Chemical and Physical Properties (modified version of Leitzke's review 2/7/80)

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 -160 ppm at 20°C
Cyclohexanone - 35%
Toluene - 25%
Isopropanol - 17%
Methylene Chloride >50%
Ligroin - 25%

102 Behavior in the Environment (modified version of 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 14^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_2 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 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.

From J.M. worthington, RCB, 3/2/81"In conclusion the three animal metabolism studies demonstrate that Bayleton is rapidly metabolized and excreted with little or no tendency to concentrate in tissues. We consider the fate of Bayleton in animals adequately delineated for the purpose of the proposed temporary tolerances. KWG 0519, KWG 0519 acid, KWG 1323 and KWG 1342 are the principal metabolites found in animal tissues."

Note: above reference concerns cow, pig and poulty metabolism studies.

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

Species	Formulation	LD50 (mg/kg)
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)

Species	Test Type	Formulation	Toxicity	Status
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	96-Hour LC50	Technical	14 ppm	
Channel Catfish	96- Hour LC50	Technical	15 ppm	Core
Daphnia magna	48-Hour EC50	Technical	1.6 ppm	Core

103.3 Beneficial Invertebrates

Honey 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.

104.0 Hazard Assessment

Acute oral and short-term dietary studies (Section 103.1-2) demonstrate that Bayleton is of low toxicity to mammals and birds. The highest rate of application requested under the proposed new uses (.5 lbs a.i./A) may result in (maximum) residues on typical avian and small mammal foods (insects, small fruits and seeds) of 6-29 ppm (Kenaga, 1973). The 'worst case' residue sitation would arise on thin broad-leaf surfaces where concentrationns of 100 ppm may occur. Using even the 'worst case' scenario acute poisoning of terrestrial wildlife appears a remote possibility.

Short-term (96-hr) fish tests for three species demonstrate with consistency the low toxicity of Bayleton (Bluegill = 11 ppm, Rainbow trout = 14 ppm and channel catfish = 15 ppm) to aquatic vertebrates. The Daphnia 48-hr LC50 though somewhat lower (1.6 ppm) suggests aquatic innvertebrates are likewise not sensitive to this compound. Bayleton is of sufficiently low toxicity such that a direct application (max. rate) to shallow water (6") would not be expected to result in significant effects (estimated concentration = 0.367 ppm).

The parent compound degrades fairly rapidly with half-life of less than one week likely under most circumstances. A major metabolite (KWG 0519), however, persists 9-12 months in soil (1/2 life). Despite the multiple application of the parent compound and potential persistence of a metabolite chronic studies with terrestrial or aquatic animals are not deemed appropriate for the following reasons:

1. Studies with mammals and poulty demonstrate that radiolabeled Bayleton was rapidly metabolized, excreted, and showed little tendency to concontrate in tissues (J. Worthington, RCB, 2/25/81).

2. Environmental Fate data do not suggest that Bayleton or its metabolites are likely to bioaccumulate or biomagnify and thus, as a food chain poison, expose sensitive higher trophic level terrestrial vertebrates at or away from the use site.

3. Bioaccumulation studies with two fish species showed no significant uptake of Bayleton.

4. An avian mini-chronicity ratio (Tucker, 1975) can not be calculated as insufficient mortality occurred in the available tests for an LC50 or LD50 to be determined. However, the principle of this index is that compounds likely to have chronic problems have disproportionately high LD50 values (single dose) relative to dietary LC50 values (multiple exposure/dose) e.g. DDT: mallard LD50 = >2240 ÷ mallard LC50 = 311 = 8.9. There is no suggestion of such a relationship for Bayleton (mallard LD50 >4600 mg/kg; mallard LC50 > 10,000 ppm).

104.3 Endangered Species Considerations

No hazards are foreseen.

105.0 Conclusions

105.1 Data Requests

Previous reviews indicate basic testing requirements have been fulfilled. No additional (higher tier) studies are required.

105.2 Summary

The proposed uses of Bayleton 50% WP do not pose an unreasonable hazard to non-target organisms.

Richard Balcomb
EEB/HED

Harry Craven
Section Head No. 4, EEB/HED

Clayton Bushong, Chief
EEB/HED

References

Kenaga, E.E. 1973. Factors to be considered in the evaluation of the toxicity of pesticides to birds. Environmental Quality and safety Vol. II, Academic Press, Inc. New York, N.Y. pp. 166-181.

Tucker, R.K. 1975. Unpublished memorandum.

RIN 5710-93

TRIADIMEFON EFB REVIEW

Page_____ is not included in this copy.

Pages 9 through 14 are not included.

The material not included contains the following type of information:

____ Identity of product inert ingredients.

____ Identity of product impurities.

____ Description of the product manufacturing process.

____ Description of quality control procedures.

____ Identity of the source of product ingredients.

____ Sales or other commercial/financial information.

✓ A draft product label.

____ The product confidential statement of formula.

____ Information about a pending registration action.

____ FIFRA registration data.

____ The document is a duplicate of page(s) _____.

____ The document is not responsive to the request.

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.
