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(8)

EE BRANCH REVIEW

DATE: IN 12/11/79 OUT 2/7/80

FILE OR REG. NO. 3125-320

PETITION OR (EXP. PERMIT NO.)

DATE DIV. RECEIVED 12/11/79

DATE OF SUBMISSION

DATE SUBMISSION ACCEPTED

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

DATA ACCESSION NO(S).

PRODUCT MGR. NO. 21 - Panebianco

PRODUCT NAME(S) Bayleton 50% W.P.

COMPANY NAME Mobay Chemical Corp.

SUBMISSION PURPOSE Addition of grasses grown for seed to existing label on azaleas.

CHEMICAL & FORMULATION Bayleton®: 1-(4-Chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone 50%

BAYLETON® (TRIADIMEFON)

100 Pesticidal Use

Control of certain diseases on grasses grown for seed.

100.2 Application Rates.

CROP	DISEASE	Pounds BAYLETON 50% WP	REMARKS
GRASSES GROWN FOR SEED			Apply specified dosage per acre in at least 20 gallons of water per acre with [redacted] or in 7 to 10 gallons of water per acre [redacted].
Perennial Ryegrass Kentucky Bluegrass	Rusts (Puccinia species)	1/4 to 1 (1/4 to 1/2 AI)	Apply when rust pustules become readily noticeable and are increasing in number in late spring or early summer. [redacted] Under severe rust pressure, use high rates (3/4 to 1 pound (3/8 lb. to 1/2 AI) per acre) and/or more frequent applications to maintain rust control until the grass seed matures, [redacted] OF BAYLETON 50% WP (2 lb. A.I.) PER [redacted] DO NOT GRAZE TREATED FIELD OR USE ANY PART OF CROP OR CROP WASTES FOR FEED OR BEDDING PURPOSES. DO NOT PLANT FOOD OR FORAGE CROPS ON TREATED LAND WITHIN 18 MONTHS AFTER APPLICATION.

1.0 lb. a.i./A Wheat

100.3 Precautionary Labeling

(From previous review for 3125-320; L. Turner, 1/12/79). "Do not use on crops grown for food or forage. Keep out of lakes, streams, and 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."

101 Chemical and Physical Properties

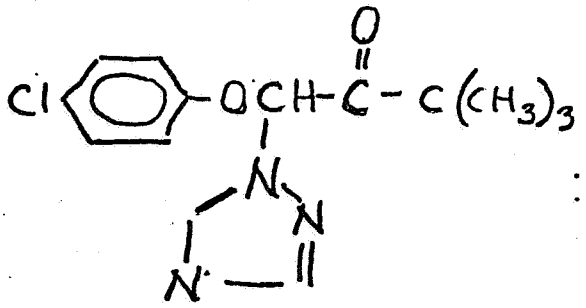
101.1 Chemical Name

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



101.4 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

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

"Aged" soil residues of Bayleton were substantially mobile in sandy 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" Bayleton 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

Bayleton is stable to hydrolysis at pH 3, 6 and 9 and temperatures of 25°, 35° 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.

dc.

In a simulated pond environment, Bayleton 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 Bayleton. However, when nitrogen-fixing symbionts in soybean nodules were exposed to 0.5 ppm Bayleton 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 GLC) was not affected.

102.4 Plant

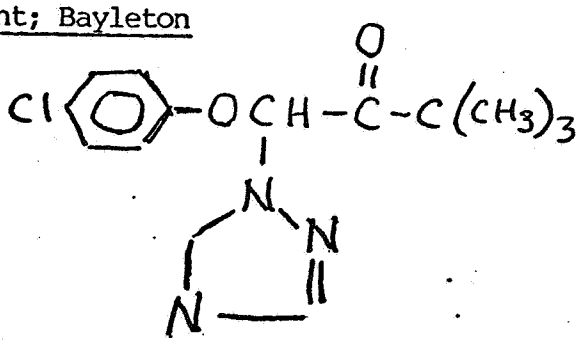
In barley plants and seeds, KWG 0519 is again the primary metabolite.

102.5 Animal

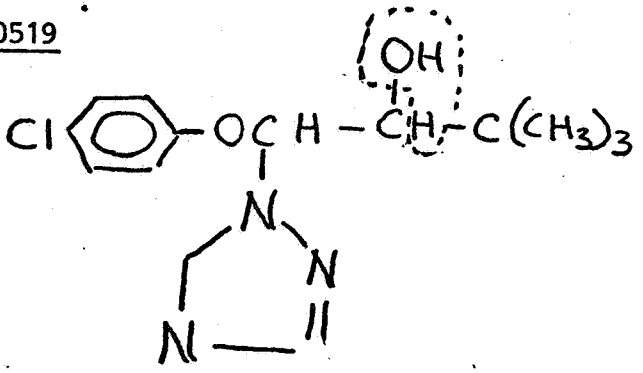
Bayleton accumulated in 28 days in catfish to levels of 6.5-7.6X in two flow-through tests at 10 and 100 ppb. Approximately 96% of activity was eliminated in the first seven to ten days of withdrawal.

102.6 Comparative Structural Formulas

Parent; Bayleton



KWG-0519



103 Toxicological Properties

103.1 Mammal

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

Rat acute oral LD_{50} (25%WP)	=	2828 mg/kg male
Rat acute oral LD_{50} (25%WP)	=	3668 mg/kg female
Rat acute oral LD_{50} (50%WP)	=	812 mg/kg male
Rat acute oral LD_{50} (50%WP)	=	1470 mg/kg female
Rat acute oral LD_{50} (92% Tech)	=	568 mg/kg male
Rat acute oral LD_{50} (92% Tech)	=	363 mg/kg female
Mouse acute oral LD_{50} (92% Tech)	=	987 mg/kg male
Mouse acute oral LD_{50} (92% Tech)	=	1071 mg/kg female
Rabbit acute oral LD_{50} (Tech)	=	500 mg/kg female
Dog acute oral LD_{50} (Tech)	=	500 mg/kg female

Teratology

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

103.2 Fish and Wildlife

(Combined from previous EEB reviews)

Species	Test Type	Form	Toxicity	Status
Mallard	Acute Oral LD_{50}	Tech	>4,000 mg/kg	Core
Mallard	Dietary LC_{50}	Tech	>10,000 ppm	Core
Bobwhite Quail	Dietary LC_{50}	Tech	>4,640 ppm	Core
Bluegill	96-hr LC_{50}	Tech	11 ppm	Core
Rainbow trout	96-hr LC_{50}	Tech	14 ppm	Core
Channel catfish	96-hr LC_{50}	Tech	15 ppm	Core
Daphnia magna	48-hr LC_{50}	Tech	1.6 ppm	Core

103.3 Beneficial Invertebrates

Honey Bees (Apis mellifera)

Contact and Oral LD_{50} (ug/bee) both greater than 25
Stevenson. 1978. Plant Pathol. 27(1):38-40
Reviewed by A. Vaughan, 11/5/79 (attached)
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. However, 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):625-28).

104 Hazard Assessment

104.1 Discussion

Bayleton® is proposed to be applied at relatively low rates, 1/2 lb a.i./acre. However, multiple applications are recommended; 4 applications are possible if the maximum amount for the year is used.

While Bayleton, as the parent compound may not be very persistent itself in the environment, its primary degradate in all studies, KWG 0519, certainly is. Note that the only metabolism that takes place is the reduction of the ketone group to a hydroxy group. Bayleton shows substantial mobility in sandy clay loam and silty clay soils. Little bioaccumulation, however, has been shown.

104.2 Likelihood of Adverse Effects

Due to its low toxicity to most organisms tested and its low application rates, little if any acute hazard of Bayleton is anticipated. Chronic and reproductive effects are possible, however, due to its multiple applications, its leaching and the extreme persistence of its primary degrate, KWG 0519, which is almost identical to the parent compound.

104.4 Adequacy of Toxicity Data

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

104.5 Additional Data Required

For all future possible crop registrations, EEB requests copies of all reviews on residues and persistence of Bayleton and its primary metabolite, KWG 0519, in and on crops and leaves. Previous reviews by L. Turner (1/12/79) and J. Tice (4/19/78) have stated that avian reproduction studies may be required in the future. Information on persistence of Bayleton on food crops may help clarify this situation.

Bayleton has multiple applications, its primary metabolite (KWG 0519) is very persistent and aquatic contamination is likely via drift and leaching. Daphnia is by far the most sensitive aquatic organism tested. Therefore, a Daphnia life-cycle test will be required prior to consideration of registration of Bayleton on grasses.

107 Conclusions

The proposed registration of Bayleton on grasses grown for seed constitutes a new and substantially dissimilar use compared to the presently registered azalea use, which is primarily for azaleas in bloom in retail nurseries. Due to increased acreage and different locations, significantly more non-target populations will be exposed to Bayleton®. Therefore, this Incremental Risk Assessment has addressed what the hazards to these additional populations are and what information must be supplied to complete this review to allow a conditional registration of Bayleton on grasses grown for seed.

107.4 Data Adequacy Conclusion

The 6 basic fish and wildlife data requirements have been submitted and found adequate to support registrations.

107.5 Data Requests

For future possible crop registrations--and depending upon supporting crop residue information, and any additional Environmental Chemistry and Toxicology data--avian reproduction studies may be required in the future.

A Daphnia life-cycle test is required to support the proposed use due to the multiple application of Bayleton, the extreme persistence of its primary metabolite (KWG 0519), and its potential for aquatic contamination from drift and leaching.

107.6 Special Notes

EEB requests copies of all reviews on residues and persistence of Bayleton and its primary metabolite, KWG 0519, in and on crops and leaves.

107.7 Recommendations

EEB does not object to the conditional registration of Bayleton® on grasses grown for seed subject to written agreement to conduct the required Daphnia life-cycle test.

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