109901

EEB's file (10)

ECOLOGICAL EFFECTS BRANCH
REVIEW

DATE: IN 2/1/80 OUT 3/31/80

FILE OR REG. NO. 3125 - 318

PETITION OR EXP. PERMIT NO. _____

DATE DIV. RECEIVED _____

DATE OF SUBMISSION 1/15/80

DATE SUBMISSION ACCEPTED _____

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

DATA ACCESSION NO(S). 231311 or 232489

PRODUCT MGR. NO. 21

PRODUCT NAME(S) Bayleton 25% W.P. or Triadimefon (Formerly BAY 8364 or MEB 6447)

COMPANY NAME Mobay Chemical Corp.

SUBMISSION PURPOSE Incremental Risk Assessment - For use on turf grasses.

CHEMICAL & FORMULATION 1-(4-Chlorophenoxy)-3,3-dimethyl-1-(H-1,2,4, triazol-1-yl)-2-butanone.....25%

Pesticide Name: Bayleton 25% W.P. (Formerly Bay MEB 6447).
1-(4-Chlorophenoxy)-3,3-dimethyl-1-
(H 1,2,4,triazol-1-yl)-2-butanone.

100.0 Pesticide Label Information

100.1 Pesticide Use

Under this request Bayleton is to be used in the control of turf grasses fungal diseases (see label for specific diseases).

100.2 Formulation Information

Bayleton 25% W.P. as the name implies coontains 25% active ingredient (a.i). The wettable powder is to be mixed with water in the proportions indicated in the label which is reproduced here in this review (see section 100.5).

100.3 Application Methods, Directions, Rates

A. Application Method/Rates

1. MIXING: The packets containing BAYLETON 25% Wettable Powder fungicide are water soluble. Do not allow packet to become wet prior to adding to the spray tank. Do not handle with wet hands. Reseal outer bag to protect remaining packets.

To prepare the spray mixture, drop the required number of unopened packets, as determined under "Recommended application," into the spray tank while filling with water to the desired level. Operate the agitator while mixing. Depending on the water temperature and the degree of agitation, the packets should be completely dissolved within approximately 5 minutes from the time they were added to the water. Do not mix with oil.

2. DOSAGE: Use specified dosage of BAYLETON 25% Wettable Powder in the amount of water necessary to give complete coverage of foliage. Determine the total amount of wettable powder to be added to the spray tank based on the rates under "recommended applications." For each 1/2 pound (8 ounces) of wettable powder to be added to the spray tank use one-8-ounce packet. For example, if it is determined that 2 pounds (32 ounces) of BAYLETON 25% Wettable Powder should be added to the spray tank, add four 8-ounce packets. The type of equipment used will determine the

concentration required; however, use of these packets is not recommended for making highly concentrated mixtures such as used in aircraft spraying.

It is the understanding of this reviewer that the fungicide is to be sprayed with conventional ground equipment, however, older labels indicate that aircraft application is also used and that in the absence of label amendment proposals from the registrant such use will continue.

B. Rates

1. Preventive and curative rates are to be applied twice at 7 to 10 day intervals. (See Amendment of previously registered label under section 100.5 of this review). Application rates would vary between 0.125 oz. a.i/gal (1.027 ppm) and 0.5 oa.i/gal (8.2/7 ppm). Curative rates are about twice as high as preventive rates (2,4,5 and 8 - 1,2, and 4 ounces of Bayleton 25% W.P. per 1000 sq. ft.). The maximum application rate of 8 oz. of Bayleton 25 W.P. (25% a.i) per 1000 sq. ft. is equivalent to 5.445 lbs a.i/A.

   The highest of the above given application rates resulted in calculated foliar residues of about 1,200 ppm on short grass blades and, if directly applied to water, it would result in a concentration of about 4,772 ppb in the top 6" of water (4.8 ppm).

100.4 Target Organisms

Dollar spot

Red thread

Striped smut

Brown patch

Rusts

Fusarium blight

Grey Snowmold

Pink Snowmold

100.5 Precautionary Labeling

(From 50 WP Chemagro product reviewed for azalea use by L. Turner 1/12/79)

Bayleton 25 WP and Bayleton 50 WP: "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."

Additional Precautionary labeling from a proposed EUP, 3125-EUP-156 and 157 reviewed by J. Tice of EEB on 4/19/78:

Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies.

Container Disposal:

Dispose of in an incinerator or landfill approved for pesticide containers, or bury in a safe place.

The following in a typed reproduction of the label amendments proposed by the registrant. Notice that the label states "To Previously Registered Labeling Add the Following;" however, the specific label to which this amendment is to be added is not clearly referenced. EEB believes that such clear reference must be made and submitted to EPA.

U.S. LABEL

Reason to Issue: To propose use on turf grasses.

Date of Draft: 1/3/80 (Pre-Reg.) (S)

EPA Reg. No. 3125-318

®BAYLETON

25% Wettable Powder

FUNGICIDE

ACTIVE INGREDIENT:
1-(4-Chlorophenoxy)-3-3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone 25%

AMENDMENT
To Previously Registered Labeling

ADD THE FOLLOWING

RECOMMENDED APPLICATION

CROP	DISEASE	Oz. BAYLETON 25% WP per 1000 Sq. Ft.		REMARKS
		Preventive	Curative	
Turf grasses (See note below)	Dollar spot Red thread Striped smut Brown patch Rusts	1	2	Apply specified amount in 2 to 4 gallons of spray per 100 sq. ft. To prevent infection, apply preventive rate at 7 to 10 day intervals as needed. To control existing infections apply curative rate twice at a 7 to 10 day interval, then apply preventive rate if needed to maintain control make all applications immediately after mowing.
	Fusarium blight	2	4 to 8	
		Two Applications	Single Application	When using two applications make the first application before the first snowfall and the second application during a temporary thaw. When using a single application, apply before first snow cover. Do not apply over snow cover. Use the high rates in areas with a history of severe snow mold damage.
	Gray snowmold Pink snowmold	2 to 4	5 to 8	

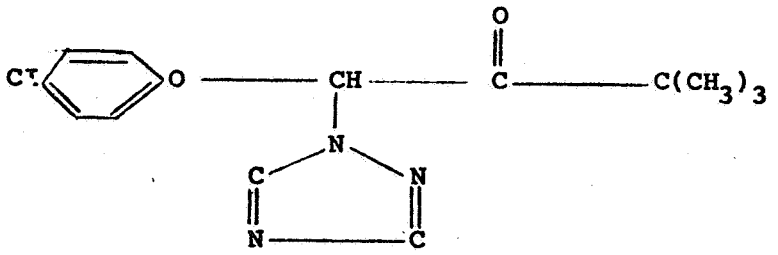
Note: Do not apply to Bermuda grass or injury may occur. Do not use clippings for animal feed.

101.0 Physical and Chemical Properties

101.1 Chemical Name

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

101.2 Structural Formula



101.3 Common Name (s)

Bayleton 25% W.P Triadimefon
Bay 8634, MEB 6447

101.4 Trade Name

Bayleton 25% W.P.

101.5 Molecular Weight

293.7

101.6 Physical state

White to tan crystals, odorless to mild aromatic

101.7 Solubility

260 ppm in water at 20°C.

102.0 Behavior in the Environment

No additional data were supplied by the registrant. This section has been copied verbatim from the 2/7/80 EEB review by J.S. Leitzke who expanded his own review from EEB's 1/12/79 Turner's 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

103.1 As of this writing the Toxicology Branch (TB) has not reviewed this new use of Bayleton. The following information was totally obtained from previous reviews by EEB.

Mammal

(Reference: Toxicology Branch memo by J. D. Doherty, 1/15/78).

Rat acute oral LD50 (25%WP)	=	2828 mg/kg male
Rat acute oral LD50 (25%WP)	=	3668 mg/kg female
Rat acute oral LD50 (50%WP)	=	812 mg/kg male
Rat acute oral LD50 (50%WP)	=	1470 mg/kg female
Rat acute oral LD50 (92% Tech)	=	568 mg/kg male
Rat acute oral LD50 (92% Tech)	=	363 mg/kg female
Mouse acute oral LD50 (92% Tech)	=	987 mg/kg male
Mouse acute oral LD50 (92% Tech)	=	1071 mg/kg female
Rabbit acute oral LD50 (Tech)	=	500 mg/kg female
Dog acute oral LD50 (Tech)	=	500 mg/kg female

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

103.2.0 Minimum Requirements (from previous reviews)

103.2.1 Avian Acute Oral LD50's

Mallard duck - Tech. > 4,000 mg/kg-CORE

103.2.2 Avian Dietary LC50's

Mallard duck - Tech. > 10,000 ppm - CORE
Bobwhite quail - Tech. > 4,640 ppm - CORE

103.2.3 Fish Acute LC50's

Bluegill 96-hr. - Tech. 11 ppm - CORE
Rainbow Trout 96-hr - Tech. 14 ppm - CORE
Channel Catfish 96-hr. - Tech. 15 ppm - CORE

103.2.4 Aquatic Invertebrate LC50

Daphnia magna 48-hr-Tech. 1.6 ppm -CORE

103.3.1. Avian Reproductive Studies

Not available

103.3.2 Terrestrial Phytotoxicity

Not available

103.3.3 Toxicity to Non-target and Beneficial Invertebrates

Insects

Honey Bees (Apis mellifera)

Contact and Oral LD50 (ug/bee) both greater than 25
Stevenson. 1978. Plant Pathol. 27(1):38-40
Reviewed by A. Vaughan, 11/5/79
Reviewer's Conclusions: This study is scientifically sound

Annelids

A previous EEB review by J. Tice (4/19/78) cited a study on manure worms (Eisenia foetida) by Hermann, 1978. 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. terrostris, 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).

104.0 Hazard Assessment

104.1 Discussion

Bayleton 25 W.P. is to be used in the control of several fungal diseases of turf grasses. The proposed label specifically indicates that this material should not be used on Bermuda grass since injury may occur (see section 100.5 of this review).

Based upon the proposed application rate of 5.445 lb. a.i/A one would expect short grass foliar residues of 1200 ppm; if directly sprayed on water the expected concentration in the top 6"-acre-layer would be 4.0 ppm and for the top 0.5" - acre-layer soil 24 ppm.

It must be noted here that the main degradate of Bayleton KWG-0519 differs structuraly from Bayleton only in that its carbonyl group is transformed into a hydroxyl group (C=O to H-C-OH). Also, the half-life of the mixture of Bayleton and KWG-0519 in soil has been experimentally estimated to be 225 days. Since it is possible that the small difference in structure may betray small differences in toxicity (toxicity may actually be enhanced) it is the opinion of this reviewer, as well as the opinion of Russell Cook from the Environmental Fate Branch (EFB), that chemical reduction of a small portion of what does not appear to be the most biologically active part of the molecule should not be used as a measure of the half-life of the material. Only structural changes that can experimentrally be clearly linked to a significant decrease in the toxicity and/or changes in the chemical structure should be used.

The use of Bayleton 25% W.P. on turf grasses constitutes a substantial increase in the use of this fungicide and, therefore, provides for much greater exposure for fish and wildlife. This situation may be greatly aggrevated should the main, untested degradate of Bayleton which has a much greater half-life be proven to have greater toxicity than the parent compound.

The environmental concentration and runoff values for Bayleton 25 % W.P. were calculated. The obtained values indicated that no serious effects are likely to occur at the proposed preventive and curative application rates under the proposed use and as long as adequate precautionary labeling is included for the protection of the aquatic environment. (See section 104.5 of this review for additional data requirements).

104.2 Likelihood of Adverse Effects to Non-target Organisms.

As shown in section 103.1 of this review, Bayleton Technical 92% is moderately toxic to mammals. The 25% W.P. Material is only slightly toxic to birds and slightly toxic to fish. Given these levels of toxicity and the apparent low bioaccumulation potential of Bayleton no problems are likely to develop with the above animal groups.

The 1.6 ppm Daphnia LC50 suggests possible complications with aquatic non-target invertebrates. Should other phases of the invertebrate life cycle prove to be more sensitive than the adult Daphnia special safeguards and/or restrictions may have to be imposed on the use of Bayleton. Futher, additional testing for adverse chronic and/or reproductive effects may be necessary.

104.3 Endangered Species Considerations.

None at present

104.4 Adequacy of Toxicity Data

All tests that have been submitted have been classified as adequate.

104.5 Additional Data Required

The long half-life of KWG-0519 as well as its potential toxicity make it necessary for EEB to request once more that a Daphnia life-cycle study be conducted. The test was previously requested by J.S. Leitzke of EEB in his review of 2/7/80. Two Daphnia life-cycle tests should be conducted. One with fresh, technical grade Bayleton and the second with Bayleton aged just long enough to insure a high concentration of KWG-0519 without sacrificing potential biological activity. Available reference for testing aged presticides is:

> Marking, L.L., and Walker, C.R., 1973. The Use of Fish Bioassays to Determine the Rate of Deactivation of Pesticides. In: Bioassay Techniques and Environmental Chemistry, 1973, Ann Arbor Sciences Publishers, Inc.

4/15/80

Also avian reproduction studies have to be conducted. Tests should utilize the major metabolite (or degradate) or the technical material if it can be shown via residue analysis that significant quantities of parent compound are metabolized in the avian feed to the major metabolite.

We request that all reviews on residues and persistance of Bayleton and its main metabolites be made available to EEB.

105.0 Classification

Not enough data available at present for this purpose.

106.0 RPAR Criteria

None at present.

107.0 Conclusions

107.1 Environmental Fate and Toxicology

Neither EFB nor TB of HED have as yet reviewed the proposed use of Bayleton on turf grasses.

107.3 Environmental Hazard Labeling

EEB requests that the same precautionary labeling used for the control of azalea petal blight be maintained, namely:

> 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.

107.7 Recommendations

EEB concurs with the proposed conditional registration provided that the registrant agrees in writing to:

a. Submit the studies requested under section 104.5 of this review within two years of granting of the conditional registration.

b. Perform any additional tests or submit any additional data that may become necessary because of the results obtained from the tests requested in this review under Section 104.5 and other test or data requested by other HED branches.

c. Send sample of the metabolite to EPA for further aquatic testing.

d. Submit any late adverse effects 6(a)(2) data that the registrant becomes aware of.

Note to P.M.

Note that this is the largest acreage registration use EEB will consider without requiring prior submission of the data requested from the registrant under section 104.5 of this review. For any future conditional registration requests for

larger acreage uses which impact on fish and wildlife, EEB will require the registrant to submit said data prior to consideration for registration.

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Norm Cook 4/15/80
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Clayton Bushong 4/16/80
Branch Chief
Ecological Effects Branch, HED, (TS-769)

March 31, 1980

Bayleton

STUDY	PARENT	KWG 0519
Solubility:	260 ppm at 20°C	—
Hydrolysis (½-life):	398 wks (DK. or Lgt. ??)	—
Photolysis (½-life):	10-12 hrs.	
Simulated Pond (½-life):	6-8 days (water phase)	Major metabolite.
	18-20 days (silt phase)	Major metabolite.
Soil Metabolism (½-life):	2 weeks	—
Plants & seeds (barley):	Major metabolite is KWG 0519.	
Anaerobic Soil (½-life):	15 days	> 139 days [illegible].
Aerobic Soil (½-life):	6 days	8-9 months.
Mobility (TLC + aged column leaching study):	Bayleton is mobile in sandy clay loam and silty clay.	
Soil (field dissipation ½-life):	5 days	225 days*

* ½-life for parent + KWG 0519

Soil Microorganisms: Little inhibition of microorganisms by Bayleton.

Channel Catfish Accum (10 ppb & 100 ppb flow-through w/o aging) [28-day exposure] [28-day withdrawal]:
10 ppb — Max. accum. of 7.6× on day 10 of exposure.*
100 ppb — " " " 6.5× " " 28 " "*
96% of residues eliminated within 7-10 days.
* whole body residues.