

109801

3-21-77

G.A.G. (1)

EEE BRANCH REVIEW

DATE: IN 3-17/77 OUT 3/21/77 IN _____ OUT _____
FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. _____

PETITION OR EXP. PERMIT NO. 359-EUP-55

DATE DIV. RECEIVED _____

DATE OF SUBMISSION _____

DATE SUBMISSION ACCEPTED _____

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

PRODUCT MGR. NO. Zink

PRODUCT NAME(S) Chipco 26019

COMPANY NAME Rhodia

SUBMISSION PURPOSE EUP - Turf

CHEMICAL & FORMULATION 3-(3,5-dichlorophenyl)-N-(1-methyl ethyl)-

2,4-dioxo-1-imidazolidine carboxamide

Environmental Safety

100.0 Pesticidal Use: A wettable powder formulation recommended for use as a turf fungicide on golf courses, sod farms, and other turf areas.

100.1 Application, Method/Directions

Chipco 26019 is a contact fungicide which may be used in a seasonal program to control several diseases or common turf grasses. On all diseases apply as a foliar spray, using 2 to 10 gallons of water per 1,000 sq. ft. Apply with a properly calibrated sprays.

Disease	Interval of Applications	RATE	
		oz. AI/1000 ft ²	oz. Form./1000 ft ²
Dollar Spot	7-14 days	.75 - 1.0	1.5 - 2.0
Brown Patch			
Helminthosporium:	14-21 days	1.0	2.0
Leaf Spot			
Melting Out			

Begin applications when conditions favor disease and repeat at recommended intervals. Do not cut treated areas or water until foliage is completely dry.

100.2 Proposed EUP

Use Pattern: A preventative treatment on a seasonal program.

Plot Size: 7,500 to 10,000 sq. ft. per treatment per location or test depending on disease.

Number of Plots: One or two rates of Chipco 26019 will be compared with one rate of Daconil 2787, depending on disease. A limited number of tests will include an untreated area.

Number of Replicates: None.

Dosage Rates: 0.75 to 1.0 oz ai/1,000 sq. ft. depending on the disease. Not all rates will be used in each test. A 2.0 oz ai/1,000 sq. ft. rate is to be included in some tests for phytotoxicity evaluations.

Daconil 2787 will be used in the tests as a commercial standard and will be used at the label rate for the disease expected.

Methods of Application: Commercial application equipment.

Season of Use: March through October.

DOLLAR SPOT AND BROWN PATCH

<u>State</u>	<u>Efficacy</u>	<u>Phyto- toxicity*</u>	<u>Avg. No. Appl.</u>	<u>Total lbs. ai.</u>	<u>Total lbs. Form.</u>
Florida	2	1	8	27.5	55
Georgia	1	1	8	20	40
Hawaii	1	1	10	25	50
Illinois	4	0	6	20	40
Indiana	2	1	6	20	40
Iowa	1	0	6	5	10
Kansas	2	0	6	10	20
Kentucky	1	0	6	5	10
Massachusetts	4	0	10	32.5	65
Michigan	4	0	6	20	40
Minnesota	2	1	6	20	40
Nebraska	2	0	6	10	20
New Jersey	1	1	10	25	50
New York	4	0	10	32.5	65
Ohio	5	0	10	40	80
Pennsylvania	3	0	10	25	50
Rhode Island	2	0	10	17.5	35
W. Virginia	1	0	6	5	10
Wisconsin	2	0	6	10	20
TOTAL	44	6		370.0	740

*Includes a 2X rate

HELMINTHOSPORIUM LEAF SPOT AND MELTING OUT

<u>State</u>	<u>Tests</u>		<u>Total lbs ai</u>	<u>Total lbs. Form.</u>
	<u>Efficacy</u>	<u>Phytotoxicity*</u>		
Alabama	1		2.5	5
Arkansas	2		5	10
California	1	1	7.5	15
Florida	4		10	20
Georgia	3		7.5	15

State	Tests		Total lbs ai	Total lbs. Form.
	Efficacy	Phytotoxicity*		
Illinois	2		5	10
Indiana	2		5	10
Louisiana	3		7.5	15
Massachusetts	3		7.5	15
Michigan	1		2.5	5
Mississippi	3		7.5	15
New Jersey	2		5	10
New York	4		10	20
North Carolina	2		5	10
Ohio	2		5	10
Oklahoma	1		2.5	5
Pennsylvania	2		5	10
Rhode Island	4		10	20
South Carolina	1		2.5	5
Texas	4		10	20
Virginia	2		5	10
TOTAL	49	1	127.5	255

*Includes a 2X rate

Quantities

For Dollar Spot and Brown Patch

Total number of applications per plot per location	398
Plots per location	2
Total number of applications per test	796
Average rate per application	1 oz ai/1000 sq. ft.
	796
Plot size 7,500 sq. ft.	7.5
Total number of oz. needed	5970
16 oz/lb	÷ 16
Pounds of material	370

For Helminthosporium

Total number of applications per plot per location	204
Plots per location	1
Total number of applications	204
Average rate per application	1 oz ai/1000 sq. ft.
	204
Plot size 10,000 sq. ft.	10
Total number of oz. needed	2040
16 oz/lb	÷ 16
Pounds of material	127.5

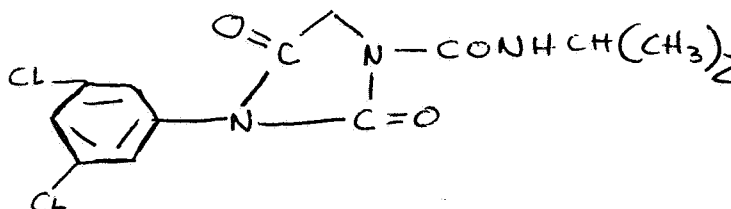
Total pounds of active ingredients needed 500

101.0 Chemical and Physical Properties

101.1 Chemical Name: 3-(3,5-dichlorophenyl)-N-(1-methyl ethyl)-2,4-dioxo-1-imidazolidine carboxamide

101.2 Common Name: Chipco 26019

101.3 Structural formula



101.4 Molecular wgt: 330.17

101.5 Off-white, cream colored powder with no odor

101.6 Solubility:

Water	~ 13 ppm
Ethanol	~ 25 gm/L
Acetone	~ 25 gm/L
Methylchloride	~ 500 gm/L

102.0 Behavior in the Environment

Using 12 months of soil samplings, the RP 26019 is degraded rapidly (half-life 30-50 days) into RP 30228 (isomer), then to RP 36221 (biuret). RP 30228 represents 50% of the total radioactivity after three months incubation then diminishes. The radioactivity bound to the soil tends to increase until it reaches about 40% of the total radioactivity found after 12 months incubation. The pH (H₂O) of the soil was 7.3.

The results of the first four months of aging show that RP 26019 converts rapidly into RP 30228 (isomer), and then more slowly degrades to RP 36221. The lowering of the incubation temperature slows down the degradation of RP 26019. Similarly, the metabolism is slower in clay loam (pH 7) than in silty clay (pH 7.6). The importance of the soil water content over the degradation kinetic is also pointed out, i.e. anaerobic conditions, with submerged soil, the RP 26019 converts rapidly into RP 30228 (isomer), which reaches about 50% of the total radioactivity after two month. The RP 26019 half-life ranges from 20-70 days at 25°C.

The ^{14}C RP 26019 study indicated a low degree of mobility in soil. Four soil types were used: loamy sand, sandy loam, clay loam, and silty clay loam, in columns of 30 cm in height, with treated non-aged soil and one-month aged soil. The simulated rainfall corresponded to 50 cm in less than 30 hours. The RP 26019 remained the upper 15 cm of soil with the majority remaining in the upper 10 cm of soil. Only traces of radioactivity was found in the leachate. The aged material was not as mobile as the parent compound as there was less downward movement of the radioactivity.

The solubility of RP 26019 in water is about 13 mg/l at 20°C. The stability of RP 26019 dissolved in water is dependent upon pH: the half-life is about 3 months at pH 5, but only one day at pH 7. The main degradation product is RP 30228, an isomeric compound of RP 26019. RP 30228 is soluble in water at only 0.5 mg/l, and therefore precipitates as it is formed from RP 26019.

The hydrolysis rate in water of ^{14}C RP 26019, uniformly labeled on the phenyl ring, was studied at pH 3, pH 6, and pH 9, and at two concentrations: about 7 mg/liter (55% of the solubility at 20°C) and 0.7 mg/liter. No significant degradation was observed after one month at pH 3. The half-life of 20 days was measured at pH 6, and complete degradation of RP 26019 was observed within one day at pH 9. The proposed degradation pathways at pH 6 include the transformation of RP 26019 into its isomer by a N-CO bond splitting and re-cyclization into the hydantoin ring. The pathway at pH 9 involved other bonds, with the complete breakdown of the hydantoin ring and eventual formation of 3,5-dichloraniline.

The half-life of RP 26019 in the soil under natural field conditions ranged from 20 to 40 days. The majority of the material remained in the upper 4 inches of the soil.

103.0 Toxicological Properties

103.1 Acute Toxicity

Rat Acute oral LD_{50} - 3,700 mg/kg - Technical RP 26019
Rat Acute oral LD_{50} - 12,500 mg/kg - 50% W.P.

Bobwhite Quail Acute oral LD_{50} - 930 mg/kg - Technical
Mallard Duck Acute oral LD_{50} - >10,400 mg/kg - Technical

Rainbow Trout 96-hr. LC_{50} - 6.70 ppm - Technical
Bluegill Sunfish 96-hr. LC_{50} - 2.25 ppm - Technical
Channel Catfish 96-hr. LC_{50} - 2.63 ppm - Technical

103.2 Subacute Toxicity

Bobwhite Quail 8-day dietary LC₅₀ - 9,200 ppm - Technical
Mallard Duck 8-day dietary LC₅₀ - >20,000 ppm - Technical

Note: Above toxicity data not ~~validated~~ at this time.

104.0 Hazard Assessments

104.1 Adequacy of Toxicity Data

Sufficient data for this EUP

104.2 Additional Data Required

Prior to final registration the following basic toxicity data must be submitted or referenced along with the aforementioned toxicity studies:

The acute 48-hour LC₅₀ for an aquatic invertebrate (Daphnia sp., preferably).

104.3 Likelihood of Exposure to Non-target Species

Preliminary toxicity studies indicate that RP 26019 is fairly toxic to fish yet only minutely toxic to birds.

Application call for a maximum rate of 1.0 oz. a.i./1,000 ft.², which converts to approximately 43.5 oz. a.i./acre or 2.7 lbs/acre. This rate is acceptable and no hazards to avian life is expected if label directions are followed properly.

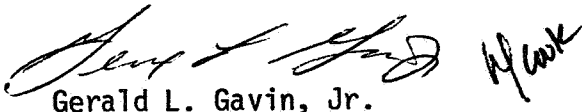
Care must be taken to avoid any accidental application to aquatic feature at the proposed application rates. Any direct contact with water at the proposed rates could yield an expected concentration in 1/2 foot of water equal to some aquatic LC₅₀ values (2.2 ppm). In addition, repeat applications with short duration intervals are proposed which could magnify aquatic contamination problems.

105.0 Conclusions

- (1) The Environmental Safety Staff concurs with the proposed EUP.
- (2) Prior to consideration of registration, the acute 48-hour LC₅₀ for an aquatic invertebrate (Daphnia sp., preferably) must be submitted.

(3) Modify label under Environmental Hazards:

"Keep out of lakes, streams, and ponds. Do not
contaminate water..."


Gerald L. Gavin, Jr.
Environmental Safety Review
Efficacy and Ecological Effects Branch