

US EPA ARCHIVE DOCUMENT

123301
SHAUGHNESSY NO.

Rec. 9-20-85
M. J. Gamma
REVIEW NO.
557-1478

EEB BRANCH REVIEW

DATE: IN 7/3/85 OUT 7/17/85

FILE OR REG. NO. 359-706

PETITION OR EXP. PERMIT NO. _____

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

DATA ACCESSION NO(S). _____

PRODUCT MANAGER NO. H. Jacoby (21)

PRODUCT NAME(S) Aliette

COMPANY NAME Rhone-Poulenc, Inc.

SUBMISSION PURPOSE Proposed registration of turf uses

SHAUGHNESSY NO.	CHEMICAL & FORMULATION	% A.I.
<u>123301</u>	<u>Aluminum tris (O-ethyl</u>	<u>80%</u>
	<u>phosphonate)</u>	
	<u>Inert ingredients</u>	<u>20%</u>

EEB Review

100 Submission Purpose and Label

100.1 Submission Purpose and Pesticide Use

The registrant, Rhone-Poulenc, Inc., has applied for a permit to use Aliette, a fungicide, on turf to control pythium blight.

100.2 Formulation Information

Aluminum tris (O-ethyl phosphonate) 80%
Inerts 20%

100.3 Application Methods, Directions, Rates

(The following information is cited directly from the label)

Aliette is a systemic fungicide which may be used in a seasonal program for the control of pythium blight on common turfgrasses on golf courses, sod farms and other turf areas. Apply as a foliar spray, using 1 to 5 gallons of water per 1000 sq ft, as indicated in the table below. Apply with a properly calibrated sprayer.

Disease	Interval of Application	Rate
		Oz form./1000 ft ²
Pythium blight	14 days	4.0
	21 days	8.0

Begin preventative applications when conditions first favor disease and repeat at recommended interval. Do not mow and/or water treated areas until foliage is completely dry. Maintain agitation during spray operations.

Do not graze animals on treated turf. Do not feed clippings from treated turf to livestock and poultry.

100.4 Target Organisms

Pythium blight on grass

100.5 Precautionary Labeling

Environmental Hazards

Do not apply directly to water or wetlands. Do not contaminate water by cleaning of equipment or disposal of wastes.

101 Hazard Assessment

Aliette will be marketed for control of pythium blight on turf. This product is currently registered for use on ornamentals and pineapples to control root rot. The turf use will require a maximum application rate of 8 oz of formulated product/1000 ft². This equates to an application rate of:

$$(8/\text{oz}/1000 \text{ ft}^2) (43560 \text{ ft}^2/\text{acre}) (1 \text{ lb}/16 \text{ oz}) = 21.78 \text{ lb formulated product}/\text{acre}$$

$$(21.78 \text{ lb } \frac{\text{formulated product}}{\text{acre}}) (.80) = 17.4 \text{ lb ai}/\text{acre}$$

101.2 Likelihood of Adverse Effects to Nontarget Organisms

Aliette is a highly water soluble fungicide (solubility in water at 20 °C = 120 g/l). Its octanol/water partition coefficient is 2×10^{-3} , indicating very low bioaccumulative potential. The half-life of Aliette was determined to be only 1 to 1 1/2 hours in loamy sand, silt loam, and clay loam soils, and 20 minutes in sandy loam soil. This rapid degradation in soil has been attributed to microbial action. However, it has been determined that Aliette does not photodegrade, and very little hydrolysis occurs under actual field conditions.

Acute toxicity values for small mammals (rat LD₅₀ = 5,400 mg/kg, rabbit LD₅₀ = 2,500 mg/kg) and birds (bobwhite quail LD₅₀ > 8,000 mg/kg) indicate practical nontoxicity of Aliette. Studies on freshwater and marine fish (rainbow trout LC₅₀ = 75.8 ppm, sheepshead minnow LC₅₀ = 120 ppm, and bluegill sunfish LC₅₀ > 150 < 200 ppm), suggest slight toxicity to practical nontoxicity of Aliette. Studies on freshwater invertebrates indicate practical nontoxicity of Aliette (Daphnia magna LC₅₀ = 304 ppm). Marine invertebrate studies indicate that Aliette is moderately toxic to these organisms (Crassostrea virginica embryo EC₅₀ = 1.9 ppm).

The following maximum estimated environmental concentrations of Aliette in soil and on foliage were derived using the methods of Hoerger and Kenaga (1972) and Kenaga (1973). These concentrations assume the use of the maximum application rate (8.0 oz/1000 ft²).

<u>Vegetation Type/Insect/Soil Surface</u>	<u>Expected Concentrations from 17.4 lb ai/acre</u>
Sparse foliage (short grasses)	4176 ppm
Long grasses	1914 ppm
Leafy situations	2175 ppm
Dense foliage/small insects	1009 ppm
Pods/seeds/large insects	209 ppm
Fruits	122 ppm
Soil (.1 inch)	3833 ppm

To estimate the environmental concentration of Aliette resulting from runoff into a .5 foot acre-layer pond, the following method was used.

Assumptions:

1. Maximum application rate = 17.4 lbs ai/acre.
2. Drainage basin = 1 acre.
3. Percent runoff = 5% (Aliette is highly water soluble so 5% runoff is a reasonable assumption.)
4. Surface area = 1 acre.
5. Average depth = .5 ft (6 inches).

$$EEC = \frac{(\text{Maximum application rate}) (\text{size of drainage basin}) (\% \text{ runoff})}{(\text{Surface area of body of water}) (\text{average depth}) (43,560 \text{ ft}^2/\text{acre}) (62.3 \text{ lb}/\text{ft}^3)}$$

$$EEC = \frac{(17.4 \text{ lb}/\text{acre}) (1.0 \text{ acres}) (.05)}{(1 \text{ acre}) (.5 \text{ ft}) (43,560 \text{ ft}^2/\text{acre}) (62.3 \text{ lb}/\text{ft}^3)}$$

$$= .641 \text{ ppm} = 641 \text{ ppb}$$

On the basis of EEC derived above, the proposed use of Aliette does not appear to present a hazard to mammals and birds. Expected residue levels on foliage are substantially lower than acute toxicity levels for these organisms.

Because of their relative insensitivity to Aliette, freshwater aquatic organisms would also be exposed to minimal hazard under the proposed use. However, the expected environmental concentration of Aliette in water is equal to one third of the EC₅₀ for oyster larvae. This would indicate that shallow estuarine areas adjacent to golf courses and turf acreage treated with Aliette could receive residues that would pose a risk to marine invertebrates. Oysters and other sessile invertebrates inhabiting shallow estuarine littoral regions could be particularly susceptible to intoxication.

It should be noted that the runoff calculation presented above does not take into consideration the effect of aerobic microbial degradation of Aliette. As noted above, aerobic soil metabolism studies have indicated that Aliette has an extremely short half-life in soil. The extent to which Aliette applied to turf would be subject to soil bacterial breakdown is, however, unknown. In view of the resistance of Aliette to photolysis and hydrolysis, and its extremely high water solubility, it is possible that substantial runoff from turf grass foliage into adjacent bodies of water could occur.

In order to assess the risk to marine organisms posed by the use of Aliette on turf, EEB requires further information on the persistence of Aliette on turf foliage and thatch. A study is therefore needed to describe the rate of degradation of Aliette applied to turf foliage and thatch. The results of this study will permit the development of an accurate estimated aquatic environmental concentration resulting from runoff. EEB is unable to complete a hazard assessment of the proposed use of Aliette on turf until these data are supplied.

101.3 Endangered Species

Endangered species triggers for aquatic organisms (an EEC of $\geq 1/20$ LC₅₀) are exceeded if Aliette is not degraded on turf grass prior to runoff. Assessment of the risk to endangered species will be deferred pending the receipt of data describing the breakdown of Aliette after application to turf.

101.4 Adequacy of Toxicity Data

The studies provided by the registrant (acute toxicity studies for birds, freshwater fish and invertebrates, and marine fish and invertebrates) fulfill guidelines requirements. However, additional data are needed to complete hazard assessment of the proposed use of Aliette on turf. EEB therefore requests a special test as described in section 70-1 of the guidelines for assessing pesticide hazards to wildlife and aquatic organisms. As noted in that section, data derived from additional tests may,

under unusual circumstances, be required by 40 CFR §158.75(a). A special test should be conducted to provide the following data:

1. Measured residues and rate of degradation of Aliette on grass and thatch after application to turf at the maximum rate.
2. The test should be designed to demonstrate the degradation of Aliette under actual use conditions on turf.
3. The test should be of sufficient duration and samples should be taken at appropriate intervals to demonstrate degradation or persistence of the test material.

The protocol for this study should be approved by EEB prior to study initiation. Determination of the need for additional chronic studies will be deferred until the results of the requested special test are available. See appendix for study protocol guidance.

101.5 Adequacy of Labeling

Determination of the adequacy of the proposed label will be deferred pending the receipt of requested data.

102 Classification

The trigger for restricted use ($EEC \geq 1/10 LC_{50}$ for aquatic organisms) is exceeded under the assumptions outlined in section 101.2. Use category classification will therefore be deferred pending the receipt of requested data.

103 Conclusion

EEB has reviewed the proposed registration of Aliette for use on turf. EEB is unable to complete a full risk assessment 3(c)(5) finding for this use because pertinent environmental chemistry data are lacking. In order to complete this assessment EEB requires data as outlined in section 101.4

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Appendix to review of Aliette for use on Turf

The following outline suggests the development of a protocol for the special test requested in this review. Prior to conducting the test, the registrant should develop a detailed protocol to be reviewed by EEB.

- I. Objective - To determine the persistence of Aliette applied on turf by obtaining an estimate of its degradation rate on grass surfaces. Residues on grass clippings should be measured at intervals after application.
- II. Location - Dry climate. This will provide a worst case scenario. Any rain during the course of the test would wash residues from grass surfaces and invalidate the test.
- III. Crop - Turf.
- IV. Plot size - To be determined by registrant.
- V. Application rate - 17.4 lbs active ingredient per acre as proposed on the label.
- VI. Application Equipment - Sprayer pulled by tractor, spray boom mounted on rear of tractor, or other appropriate golf course or commercial turf spraying equipment.
- VII. Procedure - Prior to treatment, the turf should be mowed to a height of 2.5 - 3.0 inches. As noted below, replicate samples of grass should be collected at given time intervals after application. A sample of clippings sufficient to conduct the analysis should be collected in each replicate. To collect clipping samples, the turf should be clipped to a height of approximately one inch. Residues of aliette on grass clippings should be measured using an appropriate analytical technique.
- VIII. Sampling intervals.
 - A. Immediately after application.
 - B. At hourly intervals for 12 hours after application.
 - C. At daily intervals for a minimum of two weeks after application.
- IX. Other Information - The following information is also to be included:
 - A. Weather conditions at and between each sampling interval.
 - B. Air temperature at each sampling interval.
 - C. Amount of product used.
 - D. Description of spray equipment.
 - E. Size of turf area treated.

- F. Date of experiment.
- G. Time of day of application and sampling.
- H. Type of grass treated.
- I. Topography of study area.
- J. Other relevant information (e.g. dew point)
that would indicate how the product
could have been removed from foliage surfaces.