

US EPA ARCHIVE DOCUMENT



100.0 Pesticide Use

The product is a foliar applied fungicide for the prevention and control of diseases of turfgrass.

100.1 Application Method/Directions/Rates:

Begin applications when conditions favor disease or when the disease first appears and repeat at recommended interval. Under severe conditions the higher rate and/or shorter interval of application are recommended. Do not cut treated areas, or irrigate until foliage is completely dry.

On all diseases apply as a foliar spray, using 2 to 10 gallons of water per 1000 sq. ft., as indicated in the following table:

Disease	Interval of Application	Rate oz. a.i./acre
Dollar spot	14-21 days	.75 - 1.0
Brown patch	"	"
Helminthosporium	"	1.0
Leaf spot	"	"
Melting out	"	"

100.3 Precautionary Labeling

Keep out of lakes, streams, and ponds. Do not contaminate water by cleaning of equipment or disposal of wastes.

Do not contaminate water, food or feed by storage, disposal or cleaning of equipment.

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

101.0 Chemical and Physical Properties

1. Common name: Iprodione (Anfor, BSI)
2. Chemical name: 3-(3,5-dichlorophenyl)-N-methylethyl)-2,4-dioxo-1-imidazolidinecarboxamide  
(CHEMICAL ABSTRACTS)

3. Structural formula:
4. Molecular formula:  $C_{13}H_{13}N_3O_3$
5. Molecular weight: 330.17
6. Appearance: Non-hygroscopic, off-white, cream colored powder.
7. Odor: Odorless
8. Melting point: 136 °C
9. Solubility at 20 °C:
- |                 | Grams RP26019 (approx)<br>in 1 liter solvent |
|-----------------|--|
| water           | 0.013  |
| Ethanol         | 25   |
| Acetone         | 25   |
| Methyl chloride | 500  |
10. Stability: Stable under normal conditions.
11. Density: 1.4 gm/cc

## 102.0 Behavior in the Environment

The following information was abstracted from the environmental chemistry review of R. F. Carsel dated 10/16/78. For further information see the environmental safety review by G. L. Gavin dated 3/21/77.

### 102.1 Water

a) Half-life in water is @:

pH 3	Stable
pH 6	≈ 20 d
pH 9	1 d

Degradates are more stable than parent product at pH 6 and 9.

b) Photo degradation in water.

Half-life of RP 26019 was reported to be between 72 and 187 hrs.

### 102.2 Soil

a) Light accelerated the decomposition of RP 26019 with a half-life of ≈ 7-14 d as compared to 14-31 d for dark soils for both sterile and non-sterile soils. Half-life is dependent on soil characteristics. Half-life estimates range from 8-45 d with a maximum of 160 d.

b) Mobility: Leaching will not be a problem to ground water contamination in all soils except soils that have high pH values and very fine texture.

102.3 Effects on Microbes

No inhibition in the following soil functions:

soil phosphatase activity  
cellulose or starch degradation  
degradation of 2,4-D  
denitrification

There was however, between the rate of 1-100 ppm, inhibition of nitrification in the soil. This may prove to be detrimental to grass upon repeated use - however it should not pose a problem to non-target organisms.

102.4 Microbial Effect on Product

A potential exists for the formation of azobenzene compounds from degradation products of RP 26019. Azobenzene compounds are known to be carcinogens, an example of which is TCAB.

This fact has little bearing on the safety to fish and wildlife. Exposure to carcinogens (if present) would be slight if at all.

102.5 Fish

Fish accumulation is <50x for both whole fish and edible tissue. The highest accumulation occurs in the viscera with a maximum concentration of 522.37x at day 14. Bioaccumulation is not regarded to be a significant problem.

102.6 Plants

No degradation was observed on foliar leaves of beans or cucumbers at 35 days indicating stability on foliar surfaces that are acidic in nature.

103.0 Toxicological Properties

103.1 Acute Toxicity

1) Mammal:

- (a) rat acute oral LD<sub>50</sub> 3,700 mg/kg (technical)
- (b) rat acute oral LD<sub>50</sub> 12,500 mg/kg (50% WP)
- (c) dog acute oral LD<sub>50</sub> 2,000 mg/kg (?)

2) Bird: Avian acute oral LD<sub>50</sub>

Bobwhite quail	930 mg/kg	core
Mallard duck	>10,400 mg/kg	supplemental

3) Fish: Fish acute 96 hr. LC<sub>50</sub>

Rainbow trout	6.70 ppm	core
Bluegill sunfish	2.25 ppm	core
Channel catfish	2.63 ppm	core

JBT STUDIES

4) Aquatic invertebrate acute toxicity LC<sub>50</sub>

<u>Daphnia pulex</u>	4.0 ppm (Tech)	supplemental
<u>D. magna</u>	0.43 ppm (Tech)	core
<u>D. magna</u>	7.2 ppm (Tech)	core

5) Phytotoxicity

6) Beneficial insects

103.3 Subacute Toxicity

Avian subacute dietary LC<sub>50</sub>

Bobwhite quail	9200 ppm	core
Mallard duck	>20000 ppm	core

103.4 Chronic Toxicity

An avian reproduction study was submitted. Because the protocol used was not acceptable, valid conclusions cannot be drawn. The registrant however claims that "treatment did not appear to have detrimental effect on body weight, feed consumption, mortality, egg production, fertility or hatchability in bob white quail."

104.0 Hazard Assessment

104.1.1 Likelihood of Exposure to Non-target Organisms.

Residues, Grass

One application of 1 oz a.i./acre on short grass will yield an approximate residue of 15 ppm. Assuming a worse case basis, with no degradation, an application every 14 days for a period of 4 months (rainy season) would yield a residue of 120 ppm on the vegetation. (2 oz a.i./mo. for 4 mo. = 8 oz @ 240 ppm/lb a.i.). These residues (120 ppm) are not likely to cause adverse effect with terrestrial fauna. The determined LC<sub>50</sub> and LD<sub>50</sub> values are well above this level.

#### Residues, Aquatic

Again, calculating a worse case basis, direct application 2/month for 4 months with no degradation, the estimated concentration would be 73.5 ppb. This concentration is not expected to cause adverse effects with aquatic fauna.

#### Exposure to Non-target Organisms

Song birds and small mammals may be expected to visit the areas of treated grass. However, due to the low exposure rate and relative low toxicity, no hazards from exposure are anticipated.

#### 104.1.2 Endangered Species Considerations

A hazard to endangered species is not expected.

#### 104.1.3 Adequacy of Toxicity Data

The following studies have been determined adequate to support registration.

- 1) The determination of the acute Oral LD<sub>50</sub> in Bobwhite Quail for 26019 R.P., dated December 13, 1973.
- 2) Four-day static fish toxicity studies with RP 26019 technical in Rainbow Trout, Bluegills and Channel Catfish; dated June 12, 1974.
- 3) The effects of dietary 26019 R.P. and Technical Dieldrin on young Mallard Ducks. An 8 day subacute toxicity study, conducted June 3, 1974.
- 4) The effects of dietary 26019 R.P. and Technical Dieldrin on young Bobwhite Quail. A 12 day subacute toxicity test.

- 5) The acute toxicity of R.P. 26019 technical to the water flea Daphnia magna. Straus; by A.G. Vilkas, dated November 23, 1977.
- 6) 48 hour static LC<sub>50</sub> of R.P. 26019 technical Daphnia magna; by S. Roberts dated October 11, 1977.

The following studies have been determined inadequate to support registration of R.P. 26019.

- 1) The determination of the acute oral LD<sub>50</sub> in Mallard Ducks for 26019 R.P., dated April 29, 1974. This study may satisfy minimum requirements if the number of birds tested per trial is reported.
- 2) Toxicity of R.P. 26019 to Daphnia (Daphnia pulex), dated June 3, 1977.
- 3) The effect of dietary 26019 R.P. on body weight, feed consumption, reproduction and the production of 26019 R.P. residues in body tissues and eggs of Bobwhite Quail, dated October 29, 1974.

104.1.4 Additional Data Required

Additional data is not required for this registration.

105.0 Classification

The classification of this product is "General." See attachments for calculations.

106.0 RPAR Criteria

RPAR criteria has not been exceeded.

107.0 Conclusions

Recognizing the low toxicity as well as the limited use pattern a hazard is not anticipated if the product is used according to instructions.

107.1 Environmental Fate and Toxicology

Environmental fate report by R.F. Carsel and R.E. Ney, Jr. dated October 16, 1978 and the toxicology report by R.B. Jaeger, February 7, 1978, were consulted for this review. Pertinent information is included.

107.2 Classification

General

107.3 Labeling

The current labeling is adequate for this use pattern.

107.4 Data Adequacy

The data is adequate to support registration.

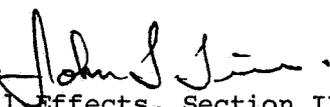
107.5 Data Requests

No data has been requested for this use pattern.

It was noted from the Environmental fate report that the dynamic fish accumulation study was not submitted. Due to low toxicity non-leachable nature, low bioaccumulation in the static test, it is felt that the additional test would not add "needed" information for this submission. It may, however, be necessary information for registration of other use patterns.

107.7 Recommendations

The environmental safety branch has no objection to the registration of RP 26019 for use on turfgrass. Adverse effects to fish and wildlife are not anticipated if the product is used according to label instructions.

John Tice   
Ecological Effects, Section II  
12/4/78

  
Richard Tucker  
Ecological Effects, Section Head (acting)

  
Clayton Bushong  
Ecological Effects Branch Chief (acting)

CLASSIFICATION

PARAMETERS	ORGANISM	GENERAL	RESTRICTED	REUTABLE PRESUMPTION
	MAMMAL $LD_{50}$	$<1/5 LD_{50}$	$\geq LD_{50}$ to $<LD_{50}$	$\geq LD_{50}$
A	DCG 2-g/kg or 80,000 ppm	$<16,000$ ppm	$\geq 16,000$ to $80,000$	80,000 ppm
	AVIAN $LC_{50}$	$<1/5 LC_{50}$	$\geq 1/5 LC_{50}$ to $<LC_{50}$	$\geq LC_{50}$
E	Ebwhite 9,200 ppm Mallard 20,000 ppm	1840 ppm 4000 ppm	1840 ppm - 9200 ppm 4000 ppm - 20,000 ppm	9200 ppm 20,000 ppm
	AQUATIC *	$<1/10 LC_{50}$	$\geq 1/10 LC_{50}$ to $1/2 LC_{50}$	$> 1/2 LC_{50}$
C	-----	N/A	N/A	N/A
D	The pesticide causes, under conditions of label use, or widespread and commonly recognized practice of use, only minor or no discernable adverse effects on the physiology, growth, population levels, or reproduction rates of non-target organisms, resulting from exposure to the product ingredients, their metabolites or degradation products, whether due to direct application or otherwise resulting from application such as through volatilization, drift, leaching or lateral movement in soil.		The pesticide causes, under conditions of label use, or widespread and commonly recognized practice of use, discernable adverse effects on the physiology, growth, population levels, or reproduction rates of non-target organisms, resulting from exposure to the product ingredients, their metabolites, or degradation products, whether due to direct application or otherwise resulting from application such as through volatilization, drift, leaching or lateral movement in soil.	<u>Chronic Toxicity:</u> Can reasonably be anticipated to result in significant local, regional, or nation population reductions in non-target organisms, or fatality to members of endangered species.

Rat LL 50 2,000 mg/kg  
 Bird LC50 9,200 ppm  
 Fish LC50 2.25 ppm

APPLICATION RATE (LES/A a.i.) 0.0625 lb ai/acre

FEED/WATER	MAMMAL		AVIAN		AQUATIC	
	General	Restricted	General	Restricted	General	Restricted
<u>Foliar Application</u>						
Forage						
Leafy Crop						
Grass - long	66.6 lbs.	6.6-333.3 lb.	333.33 lb.	7.6 lb.	7.6 - 38.3	N/A
Grass - short						
Ornamentals						
Trees						
Fruit, Seeds, Insects						
<u>Soil Application</u>						
No Incorporation <sup>2</sup>						
Granular (mg/ft <sup>2</sup> )						
Other (.1")						
Incorporation						
1"						
2"						
3"						
>3"						
<u>Aquatic Application</u>						
6" Layer H <sub>2</sub> C						
Other						

Classification Computations

$$(1) \text{ Dog LD}_{50} \quad \text{mg/kg} \quad \text{ppm}$$
$$2000 \text{ mg/kg} = \text{ppm} \times \frac{250 \text{ 2/day}}{10 \text{ kg}} = 80,000 \text{ ppm}$$