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SHAUGHNESSEY NO.

REVIEW NO.

EEB REVIEW

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

DATA ACCESSION NO(S).

PRODUCT MANAGER NO. L.ROSSI(21)

PRODUCT NAME(S) Rovrol (Iprodione)

COMPANY NAME Rhone-Poulenc

SUBMISSION PURPOSE EUP for aerial application on potatoes, onions, beans

SHAUGHNESSEY NO.	CHEMICAL, & FORMULATION	% A.I.

ECOLOGICAL EFFECTS BRANCH REVIEW

Iprodione

100.0 Submission Purpose and Label Information

100.1 Submission Purpose and Pesticide Use

Rhone-Poulenc is requesting an experimental use permit (EUP) for iprodione as a formulated product known as Rovral\ 4 Flowable for use on potatoes, beans, and dry bulb onions by aerial application.

Rhone-Poulenc, Inc. currently has registration for potatoes and dry bulb onions at the same application rate, for ground application. The registrant claims that Rovral is also registered for beans; however, EEB was not able to confirm if indeed Rovral is currently registered for use on beans (jacket in RD did not include label for beans).

100.2 Formulation and Information

Active Ingredients:	
Iprodione*	41.6%
Inert Ingredient:	58.4%
	100.0%

*3-(3,5-dichlorophenyl)-N-(1-methyl ethyl)-2,4-dioxo-1-imidazolidinecarboxamide.
4 lb ai/gallon

100.3 Application Methods, Directions, Rates

Rovral may be applied by aerial equipment on dry bulb onions, potatoes, and beans (dry, lima, and snap).

The application rate varies from 1.5 pints of product or 0.75 lb ai/A on onions to 2.0 pints of product or 1.0 lb ai/A on potatoes and beans.

Applications per crop vary as follows:

- o Beans - up to two applications with 7-day interval.
- o Potatoes - up to four applications with 7- to 10-day interval or as required.
- o Dry Bulb Onions - Up to five applications can be made per season, with a 14- to 21-day interval.

This EUP proposes to use Rovral in several states, with maximum plot size being 3 acres and the season of use ranging from April through September. Please see Attachment A for specific States, acreage, and proposed quantities of Rovral to be used.

100.4 Target Organisms

For Potatoes:

White Mold	Sclerotinia sclerotiorum
Early Blight	Alternaria solani

For Dry Bulb Onions:

Botrytis Leaf Blight	Botrytis squamosa
Purple Blotch	Alternaria porri
Botrytis Neck Rot	Botrytis allii

For Dry, Lima and Snap Beans:

White Mold	Sclerotinia sclerotiorum
Gray Mold	Botrytis cinerea

100.5 Precautionary Labeling

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

101.0 Hazard Assessment

Discussion

In 1983, over 1,270,000 acres of potatoes were planted in the United States. Washington, North Dakota, Idaho, and Maine harvest 49 percent of the total acreage in this country (Agricultural Statistics, 1984).

Over 178,000 acres of dry beans were planted in the United States in 1983. Michigan, Nebraska, North Dakota, California, and Colorado planted 81 percent of the total dry bean acreage planted.

In 1983, over 197,130 acres of snap beans were harvested, and of that, Wisconsin, New York, Oregon, and Michigan harvested more than 73 percent of the total acreage.

In 1983, over 121,540 acres of onions were harvested in this country. Of that, Texas, California, Colorado, and New York harvested 58 percent of the total acreage.

101.2 Likelihood of Adverse Effects to Nontarget Organisms

Terrestrial Organism Toxicity

The available avian toxicity data indicate iprodione is slightly toxic to upland game (bobwhite LD_{50} = 930 mg/kg) on an acute oral basis and practically nontoxic to upland game and waterfowl (bobwhite LC_{50} = 9200 ppm, mallard LC_{50} = 20,000 ppm) on a dietary basis. The avian reproduction MATC was determined to be > 300 and < 1000 ppm.

Iprodione is practically nontoxic to the rat with an acute oral LD_{50} = 1170 mg/kg.

Aquatic Organism Toxicity

Acute - Freshwater

Iprodione is moderately toxic to both coldwater and warmwater fish (rainbow trout LC_{50} = 4.2 ppm and catfish LC_{50} = 3.02 ppm). This chemical is highly toxic to Daphnia magna with a reported LC_{50} = 0.43 ppm. Iprodione is moderately toxic to juvenile crayfish with a 7-day LC_{50} > 4.1 ppm.

Acute - Marine

Iprodione technical is moderately toxic to the oyster with a reported 96-hour EC_{50} = 2.3 ppm, and highly toxic to mysid shrimp (LC_{50} = 0.68 ppm). This compound is moderately toxic to the sheepshead minnow with a reported LC_{50} = 7.7 ppm.

Chronic Toxicity - Freshwater

A Daphnia magna life cycle study indicates a MATC > 0.17 < 0.33 ppm. A fathead minnow early life stage toxicity study indicates the larval survival MATC to be > 0.26 mg/L and < 0.55 mg/L.

Chronic Toxicity - Marine

A supplemental mysid life cycle study indicated there was an effect on reproductive success at the lowest dose tested, 0.015 mg/L (15 ppb) mean measured concentration.

Formulated Data

Formulated testing indicates Rovral (50% ai) is moderately toxic to warmwater fish and highly toxic to freshwater invertebrates (bluegill LC_{50} = 8.6 ppm and Daphnia magna LC_{50} = 0.36 ppm).

Environmental Fate and Residues

Iprodione is stable to hydrolysis at a pH of 3, and the hydrolysis half-life is 20 days at a pH of 6 and 1 day at a pH of 9. The photolysis half-life is less than 1 week. Persistence of the parent compound in a field dissipation study ranged from 1 to 12 weeks. The water solubility is 13 ppm (EAB Review, December 17, 1987, H. Manning).

An aquatic field dissipation study indicated that the initial concentration of parent iprodione ranged from 0.02 to 0.70 ppm, and the degradate RP-30228 comprised up to 50 percent of the total residue immediately posttreatment (EAB Review, July 30, 1987, H. Manning).

The half-life of 14^C iprodione ranged from 20 to 70 days for soil under aerobic conditions and from 20 to 50 days for soil under anaerobic conditions.

An incomplete study indicated residues in rice grain from a 1.0 lb/A treatment gave 1.1 to 2.5 ppm at 32 to 36 days posttreatment in Louisiana; in Mississippi, 0.8 to 0.7 ppm 32 to 58 days posttreatment; and in Arizona, 0.5 to 0.2 ppm 38 to 43 days posttreatment. Residues in straw were generally slightly higher (EAB Review, May 5, 1986, H. Manning).

Iprodione residues accumulated in crayfish with maximum bioconcentration factors of 10X in edible tissue and 20X in whole organisms during 28 days exposure (EAB Review, July 30, 1987, H. Manning).

A bluegill sunfish accumulation study indicated a maximum bioaccumulation in edible tissue of 103X in 7 days, in viscera it was 555X in 7 days, and in whole fish it was 177X in 7 days. By day 28, it was 65X (edible), 155X in viscera, and 52X (whole fish) (EAB Review, May 6, 1986, H. Manning).

Terrestrial Residues

The following residues are expected immediately following a single application of 1.0 ai/A (based on EEB's nomograph, Urban, D.J.; Cook, N.J. (1986); Hazard

Evaluation Division, Standard Evaluation Procedure, Ecological Risk Assessment):

Substrate	Residues (ppm)
Short rangegrass	240
Long grasses	110
Leaves and leafy crops	126
Forage (alfalfa and clover, exposed seeds, small insects)	58
Pods containing seeds (large insects)	12
Fruit	8
Soil (top 0.1 inch after direct application)	22

Aquatic Residues

The following aquatic estimated environmental concentration (EEC) was calculated based on the EEB scenario of a 10-acre drainage basin draining into a 1-acre farm pond. The EEC from aerial application is calculated as follows:

A. Runoff

1 lb x 0.6 (appl. efficiency) x 0.02 (2% run-off) based on water solubility of 13 ppm) x 10 (A) (10 A. d. basin) = 0.12 lb (tot. runoff)

B. Drift

1 lb x 0.05 (5% drift) = 0.05 lb (total drift)

Tot. loading = 0.12 lb (tot. runoff) + 0.05 lb (tot. drift) = 0.17 lb

Therefore, EEC = 61 ppb x 0.17 (lb) = 10.37 ppb*

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*The EEC is 7.77 ppb for onions since the application rate is only 0.75 lb ai/A.

101.3 Risk Assessment

A. Effects on Terrestrial Organisms

Avian Wildlife

Iprodione is slightly toxic to upland game on an acute oral basis, and practically nontoxic to both upland game and waterfowl on a dietary basis.

Based on the maximum estimated residues in short rangegrass, 240 ppm is well below both the triggers for Restricted Use Classification and the endangered species classification (1/5 LC_{50} = 1840 ppm and 1/10 LC_{50} = 920 ppm, respectively). The residue of 240 ppm is also below the avian reproductive NOEL $\leq$ 300 ppm.

Mammals

Iprodione is not expected to pose a hazard to mammals based on the acute oral rat LD_{50} = 1170 mg/kg which is converted to 11700 ppm (See Attachment B). The short rangegrass residue
of 240 ppm is well below both the Restricted Use and endangered species classification triggers (740 and 370 ppm, respectively).

B. Effects on Aquatic Organisms

Iprodione technical is moderately toxic to both freshwater and marine fish with reported LC_{50} values ranging from 3.02 to 7.7 ppm. Iprodione technical is highly toxic to freshwater invertebrates with an LC_{50} of 0.43 ppm for Daphnia magna and moderately toxic to highly toxic to marine invertebrates. The Daphnia magna life cycle MATC was reported to be > 0.17 < 0.33 ppm. The MATC for fathead minnow early life stage toxicity study was > 0.26 mg/L and < 0.55 mg/L.

The NOEL was less than 0.015 mg/L for a supplemental mysid life cycle study.

An EEC of 10 ppb (7 ppb for onions) is well below 1/2 LC_{50} trigger of 215 ppb for aquatic invertebrates. In addition, the EEC is below the lowest effect level of 15 ppb for the mysid, and the NOEL for the Daphnia magna of 170 ppb.

Based on the estimated exposure and the aquatic toxicity data, the use of Rovral on potatoes, onions, and beans is not expected to pose a hazard to nontarget aquatic organisms.

Endangered Species Considerations

There are no concerns for endangered terrestrial or aquatic organisms based on the estimated residues and the available toxicity data.

101.4 Adequacy of Toxicity

No additional ecological effects data were submitted with this EUP. If the registrant applies for section 3 registration for this compound to be applied by aerial equipment on beans, then a honey bee acute contact LD50 study is required. This study is required since bees are known to frequent areas where beans are grown.

101.5 Adequacy of Labeling

The following labeling is required:

> This pesticide is toxic to aquatic invertebrates. Do not apply directly to water or wetlands (swamps, bogs, marshes, and potholes). Drift or runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water when disposing of equipment washwaters.

102.0 Classification

Based on current toxicity data, the use of this chemical does not require Restricted Use Classification.

103.0 Conclusions

EEB has completed the review of the EUP application to use Rovral (Iprodione Technical) on potatoes, onions, and beans.

Based on the estimated exposure, and the available toxicity data, the proposed EUP is not expected to pose a hazard to nontarget terrestrial or aquatic organisms (neither endangered nor nonendangered).

Attachment

Candy Brassard 3/8/89
Candy Brassard
Ecological Effects Branch
Environmental Fate and Effects Division (H7507C)

Douglas J. Urban 3/13/89
Douglas J. Urban, Head-Section III
Ecological Effects Branch
Environmental Fate and Effects Division (H7507C)

James W. Akerman 3/14/89
James W. Akerman, Chief
Ecological Effects Branch
Environmental Fate and Effects Division (H7507C)

Attachment B

Conversion of LD50 mg/kg to ppm

Assumptions:

The Acute Oral Rat LD_{50} is 1170 mg/kg.

A young rat consumes 10 percent of its body weight a day.

The formula used for conversion is as follows:

$$\frac{\text{The LD50}}{\%\ \text{food consumption}} = \text{ppm}$$

$$\frac{1170\ \text{mg/kg}}{\%\ \text{food consumption}} = 11700\ \text{ppm}$$

ATTACHMENT 4

TEM G

4

G.2

AMOUNT OF PESTICIDE TO BE USED BY CROP

BEANS (Dry, Lima & Snap)

STATE AND AMOUNT OF PESTICIDE TO BE USED

STATE	ROVRAL 4F LBS AI/A	NUMBER OF TESTS	TOTAL ACREAGE	NUMBER OF APPL'S	TOTAL LBS AI
NY	1.0	6	18	2	36
WI	1.0	6	18	2	36
CA	1.0	2	6	2	12
MN	1.0	2	6	2	12
ND	1.0	2	6	2	12
OR	1.0	2	6	2	12
		20	60		120
				+ 20 % extra	24
					144

144 lbs ai / 4#/gal = 36 gallons of product

DRY BULB ONIONS

STATE AND AMOUNT OF PESTICIDE TO BE USED

STATE	ROVRAL 4F LBS AI/A	NUMBER OF TESTS	TOTAL ACREAGE	NUMBER OF APPL'S	TOTAL LBS AI
CA	0.75	1	3	5	11.25
CO	0.75	2	12	5	45.00
ID	0.75	3	15	5	56.25
MI	0.75	2	6	5	22.50
NM	0.75	1	9	5	33.75
NY	0.75	1	3	5	11.25
OR	0.75	1	9	5	33.75
TX	0.75	2	12	5	45.00
WA	0.75	3	15	5	56.25
		16	84		315.00
				+ 20 % extra	63.00
					378.00

378.0 lbs ai / 4#/gal = 94.5 gallons of product

G.2 (Cont'd)

POTATOES

STATE AND AMOUNT OF PESTICIDE TO BE USED

STATE	ROVRAL 4F LBS AI/A	NUMBER OF TESTS	TOTAL ACREAGE	NUMBER OF APPL'S	TOTAL LBS AI
CA	1.0	1	6	2	12
CA	1.0	3	9	4	36
ME	1.0	1	6	2	12
ME	1.0	3	9	4	36
MI	1.0	1	6	2	12
MI	1.0	1	6	4	24
MN	1.0	1	6	2	12
MN	1.0	1	6	4	24
WI	1.0	1	6	2	12
WI	1.0	1	6	4	24
CO	1.0	1	6	4	24
		15	72		228
				+ 20 % extra	46
					274

274 lbs ai / 4#/gal = 68.5 gallons of product

The total amount of pesticide used would be:

Beans	144.0 lbs ai
Dry Bulb Onions	378.0 lbs ai
Potatoes	274.0 lbs ai
TOTAL	796.0 lbs ai

G.3

PROGRAM DETAILS

a.	Target Pests	*Alternaria solani, A. porri, Botrytis cinerea, B. squamosa, B. allii, and Sclerotinia sclerotiorum*
c.	Crops	Beans, Dry Bulb Onions, and Potatoes
d.	Major Geographic Areas	See Item G.2
e.	Desired Months for Application to Begin	Beans = May - June Dry Bulb Onions = April - June Potatoes = May - July
f.	Use Pattern	Beans = 2 applications Dry Bulb Onions = 5 appl's Potatoes = 2 to 4 appl's
g.	Plot Size	1A for Efficacy trials 3A for Residue trials
h.	Number of Replications	3 for Efficacy Trials None for Residue: 3 random sub-samples from 3 A strip.
i.	Dosage Rates	Beans & Potatoes = 1.0 lb ai/A in 5 gallons of water. Dry Bulb Onions = 0.75 lb ai/A in 5 gallons of water.
j.	Methods of Application	Foliar by Fixed Wing Aircraft or Helicopter
k.	Season of Use	April - September
l.	Timing of Application	

Beans - 1st bloom to 10% bloom plus 2nd application 7 days later.
Dry Bulb Onions - apply as a foliar spray as soon as conditions become favorable for disease. Repeat applications at 14 to 21 day intervals as long as conditions favor disease development with a maximum of a 5 applications / season alternating with another registered contact fungicide observing a 7 day PHI.
Potatoes - <u>For white mold</u>, at 1st sign of disease or row closure + 14 to 28 days later.
<u>For early blight</u>, begin applications when conditions first become favorable for disease. Up to 3 subsequent sprays can be applied at 7 to 10 day intervals or as required observing a 14 day PHI.