109801
SHAUGHNESSEY NO.

13
REVIEW NO.

EEB BRANCH REVIEW

DATE: IN 7-26-82 OUT 9/3/82

FILE OR REG. NO. 359-685

PETITION OR EXP. PERMIT NO.

DATE OF SUBMISSION 7-15-82

DATE RECEIVED BY HED 7-26-82

RD REQUESTED COMPLETION DATE 9-11-82

EEB ESTIMATED COMPLETION DATE 9-4-82

RD ACTION CODE/TYPE OF REVIEW 330/Amendment -- New Food/Feed Use

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

DATA ACCESSION NO(S).

PRODUCT MANAGER NO. H. Jacoby (21)

PRODUCT NAME(S) Rovral

COMPANY NAME Rhone-Poulenc Inc.

SUBMISSION PURPOSE Proposed Conditional Registration of Almonds use

SHAUGHNESSEY NO.	CHEMICAL, & FORMULATION	% A.I.
109801	3-(3,5-dichlorophenyl)-N-(1-methylethyl)-2,4-	
	dioxo-1-imidazolidinecarboxamide	50.0%

100.0 Pesticide Use

Rovral (Iprodione) is a wettable powder fungicide used for the control of Brown Rot, Blossom Blight, and the suppression of Shothole in almonds.

100.1 Application Rates

Lbs. Prod/100 gal	Lbs. Prod./Acre
0.25	1.0

Number of application limited to two (2) per year.

100.3 Application Methods and Directions

See attached Label (Appendix I).

100.4 Precautionary Labeling

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

100.5 Target Pests

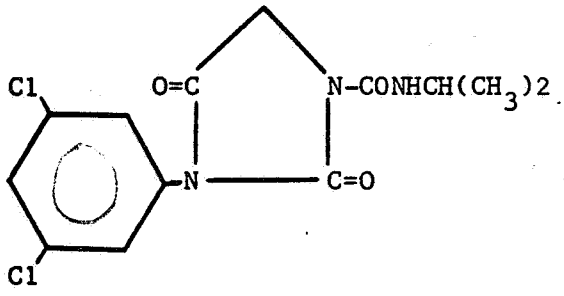
Monilinia Laxa = Brown Rot or Blossom Blight

Coryneum beijerinckii = Shothole

101.1 Chemical Name

3-(3,5-dichlorophenyl)-N-(1-methylethyl)-2,4-dioxo-1-imidazolidinecarboxamide

101.2 Structural Formula



101.3 Common Name

Iprodione, Rovral, Chipco.

102.0 Behavior in the Environment

See previous EEB and EFB reviews by J. Tice (12/4/78), J. Felkel (1/21/82), and H. Manning (1/21/82).

103.0 Toxicological Properties

See EEB review by J. Felkel(1/21/82).

104.0 Hazard Assessment

This review is being conducted as an incremental risk assessment for the conditional registration of Rovral on almonds. Rovral (Iprodione) is presently registered to control fungus on stone fruits (peaches, cherries, necterines), kiwi fruits, turf, and ornamentals. Acreage estimates for registered uses in California are listed below:

Crop	Acreages
Kiwi fruit	1,898
Necterines	21,577
Peaches	83,791
Cherries	13,791
Turf	Data not available
Ornimentals	Data not available
Totals	>121,000

Mammalian Exposure

Rovral is practically non-toxic to mammals (mouse LD_{50}=3050 mg/kg). Exposure to mammals is expected to via the ingestion of dietary items contaminated by Rovral residues. A mouse LD_{50} of 3050 mg/kg was used to determine a mammalian classification trigger (1/5 LD_{50}) 610 mg/kg.

At the maximum proposed yearly application rate of one (1) pound active ingredient/acre, Rovral residues on potential feed items should not pose a hazard to non-target mammals.

Avian Exposure

Rovral is practically non-toxic to upland game birds (bobwhite LC_{50} = 9200 ppm) and waterfoul (mallard LC_{50} = >20,000 ppm). A bobwhite quail feeding study (LC_{50} = 9200 ppm) was used establish an avian classification trigger of 1,840 ppm. Exposure to birds is expected to occur through the ingestion of seeds and insects contaminated by Rovral residues.

Table 1. Summary of all California farms engaged in the production of almonds, by county (1978 Census of Agriculture).

ALMONDS									
California	6 717	347 159	25 893 263	2 605	2 332 850	6 279	23 560 413	5 265	262 346 348
Alameda	12	22	1 016	2	(D)	11	(D)	7	1 380
Amador	3	(D)	129	1	(D)	2	(D)	2	(D)
Butte	481	30 830	2 151 299	238	162 829	469	1 988 470	428	37 786 829
Calaveras	8	50	4 439	2	(D)	8	(D)	4	(D)
Colusa	110	14 113	823 910	29	61 076	107	762 834	99	9 605 998
Contra Costa	166	2 780	180 885	63	20 136	161	160 749	129	1 896 565
El Dorado	10	2	139	6	53	7	86	5	280
Fresno	513	21 808	1 734 921	128	209 130	478	1 525 791	405	11 642 384
Glenn	144	8 649	777 321	56	67 476	137	709 845	119	9 541 600
Kern	204	62 722	5 246 306	36	127 891	197	5 118 415	192	47 072 341
Kings	30	3 940	288 813	5	(D)	29	(D)	24	2 677 306
Lake	13	156	12 863	6	1 051	12	11 812	11	60 952
Los Angeles	45	523	20 339	16	2 817	40	17 522	28	175 975
Madera	204	18 149	1 462 524	64	183 450	191	1 279 074	169	6 852 750
Merced	938	51 931	3 987 089	443	463 097	893	3 523 992	794	35 185 848
Monterey	8	16	957	2	(D)	7	(D)	3	(D)
Nevada	4	1	15	3	(D)	1	(D)	1	(D)
Placer	28	175	11 635	7	729	25	10 906	15	87 244
Riverside	24	37	1 944	13	1 018	11	926	4	483
Sacramento	34	1 426	62 374	13	(D)	31	(D)	15	(D)
San Bernadino	13	(D)	4 489	8	(D)	8	(D)	6	(D)
San Diego	25	19	1 062	9	415	18	647	7	(D)
San Joaquin	832	33 443	2 188 765	382	239 141	802	1 949 624	727	28 403 211
San Luis Obispo	140	4 395	253 343	34	45 759	134	207 584	83	379 764
San Mateo	3	(D)	12 755	1	(D)	3	(D)	3	(D)
Santa Clara	16	193	11 637	8	3 407	15	8 230	10	59 150
Santa Cruz	3	(Z)	17	3	(D)	1	(D)	–	–
Shasta	6	(D)	(D)	–	–	6	(D)	1	(D)
Solano	75	3 245	185 242	28	9 066	73	176 176	70	3 807 841
Stanislaus	1 332	54 039	4 114 618	564	543 083	1 238	3 571 535	1 088	41 384 270
Sutter	160	5 049	369 894	75	36 444	155	333 450	141	5 029 965
Tehama	74	4 546	360 832	28	8 115	65	352 717	42	4 444 971
Tulare	82	8 595	702 252	16	50 961	79	651 291	69	4 781 030
Tuolumne	4	1	(D)	3	8	2	(D)	–	–
Ventura	6	(D)	455	3	(D)	4	(D)	2	(D)
Yolo	216	8 390	477 816	78	37 449	212	440 367	185	5 323 384
Yuba	31	2 400	162 361	12	6 493	27	155 868	22	3 085 799
All other counties	15	531	36 833	11	5 776	6	31 057	4	462 073
Farms not on mail list	705	4 774	240 215	209	39 019	614	201 196	351	1 328 750

Almonds:									
Acres	6 717	347 159	25 893 263	2 605	2 332 850	6 279	23 560 413	5 265	262 346 348
0.1 to 0.9 acres	563	122	5 541	200	1 589	434	3 952	146	36 374
1.0 to 4.9 acres	966	2 717	184 884	315	20 933	901	163 951	676	1 303 704
5.0 to 14.9 acres	1 430	12 521	905 829	571	154 348	1 311	751 481	1 052	6 616 180
15.0 to 24.9 acres	1 147	21 409	1 554 637	493	227 711	1 086	1 326 926	976	12 675 951
25.0 to 49.9 acres	1 163	40 961	2 874 942	460	378 047	1 122	2 496 895	1 033	26 071 087
50.0 to 99.9 acres	672	46 160	3 287 542	262	381 217	656	2 906 325	630	32 059 573
100.0 acres or more	776	223 270	17 079 888	304	1 169 005	769	15 910 883	752	183 583 479

104.2 Estimated Environmental Concentrations

Estimated aquatic residues for lentic ecosystems contaminated by rainwater runoff and a theoretical 2X direct application.

	Almonds (maximum application rate = 1 lb/active/acre)		
Rovral % Runoff	6 inches of water (ppm)	12 inches of water (ppm)	6 feet of water (ppm)
0.5	0.003	0.001	0.003
1.0	0.007	0.003	0.0006
5.0	0.036	0.018	0.003
100.0 **	0.735	0.367	0.061

Estimated environmental concentrations for soil surfaces and potential avian dietary items immediately following product application.

Pounds active/acre	Seeds (ppm)	Almond tree leaves (ppm)	Insects (ppm)	Soil Top 1 inch (ppm)
.5	6	63	29	11.0
1.0	12	125	58	22.0

** Assumes two (2) repeat applications to a six (6) inch layer of water.

The degree to which non-target avain species could be exposed to Rovral residues was examined for a worst case situation (ie., two 0.5 lbs applications) in Table 2. Comparison of estimated daily body burdens to emperical and calculated LC_{50} values for eight species of non-target birds reveals the following:

1. Birds feeding on dietary items contaminated with " worst case " residues would not exceed the 1840.0 ppm restricted use trigger.

2. Small insectivorus birds (14-day old bobwhite, Carolina wren) could be exposed to the highest Rovral residues.

3. Expected daily dietary burdens are well below the 1000 ppm reproductive impairment level determined for bobwhite quail (Felkel 1/21/82; section 103.3.1).

Aquatic Exposure

Rovral is moderately toxic to warmwater (bluegill LC_{50} = 6.3 ppm) and coldwater (rainbow LC_{50} = 4.2 ppm) fishes. Bioassays conducted with both technical (94.5%) and formulated product (50% WP) have shown the this fungicide is moderately toxic to freshwater invertebrates (Daphnia magna LC_{50} = 7.2 and 5.8 ppm, respectively). The chronic effects of Rovral on freshwater fish and aquatic invertebrates are not known. A 96 hour rainbow trout study (LC_{50} = 4.2 ppm) was used to determine a restricted use classification trigger (1/10 LC_{50}) of 0.42 ppm. A 48-hour Daphnia magna study (LC_{50} = 5.8 ppm) conducted with formulated product was used to calculate a freshwater invertebrate trigger (1/10 LC_{50}) of 0.58 ppm.

Exposure to non-target aquatic organisms is expected to occur via rainwater runoff and to a lesser extent from irrigation return flow waters. Estimated aquatic residues from runoff and a theoretical 2X direct application to water are shown in Section 104.2

Comparison of expected aquatic residues to fish and invertebrate classification triggers indicates the following:

1. That residue levels resulting from a direct application of Rovral (0.5 lbs/Active/Acres) to six (6) inches of water would not exceed restricted use triggers for non-target fish and invertebrates.

2. That expected residues resulting from rainwater runoff (i.e., 0.5-5%) do not exceed restricted use fish (0.42 ppm) and aquatic invertebrate (0.58 ppm) triggers.

Table 2A.

Calculated LC_{50} values and estimated toxicant exposure (MG/KG/DAY and MG/ANIMAL/DAY) for seven species of non-target birds.

SPECIES 2/	BODY WGT. (GMS.)	FOOD CONS. (GMS.)	F. CONS./ B. WGT (%)	CALCULATED LC50 (PPM) 6/	TOXICANT MG/KG/DAY	CONSUMED 4/ MG/ANIMAL/DAY	1/5 CALCULATED LC50 5/	1/10 LC10 7/
1. Bobwhite Quail (Young)	30.0 1/	6.0 2/	20.0	9200.0	1840.0	55.2	1840.0	920.0
2. Bobwhite Quail (Adult)	170.00	15.20	8.94	20579.0	1840.0	312.8	4116.0	2058.0
3. Robin	81.10	8.11	10.00	18377.0	1840.0	149.0	3675.0	1838.0
4. Mourning Dove	100.00	11.20	11.20	16429.0	1840.0	184.0	3286.0	1643.0
5. Eastern Cowbird	50.00	7.00	14.00	13143.0	1840.0	92.0	2629.0	1314.0
6. Field Sparrow	13.90	4.60	33.10	5560.0	1840.0	25.6	1112.0	556.0
7. Grasshopper Sparrow	13.90	4.60	33.10	5560.0	1840.0	25.6	1112.0	556.0
8. Carolina Wren	19.00	6.50	34.20	5378.0	1840.0	35.0	1076.0	537.8

1/ Milligrams body WGT. (Average weight).

2/ Average 5-day food consumption.

3/ LC_{50} determined by registrant's testing facility.

4/ MG/ANIMAL/DAY = MG/KG/DAY X Body weight (kg)

5/ 1/5 LC_{50} value for registration labeling criteria.

6/ $$LC50(ppm) = \frac{1840 \text{ mg/kg/day}}{\text{F. Con.(g) /B. WGT (g)}}$$

7. 1/10 LC_{10} value for hazard evaluation to endangered species.

Table 2B.

Dietary contamination and total estimated residues for eight species of non-target birds.

SPECIES	CALCULATED LC_{50} (PPM)	1/5 CALC. [2] LC_{50} (PPM)	FOOD CONSUMED [3] Animal (%)	Plant	MAXIMUM EXPECTED RESIDUES [4] (PPM) Animal	Plant	MAXIMUM ADJUSTED RESIDUES [5] Animal	Plant	TOTAL [6] RESIDUES (PPM) Both Plant/Animal
Bobwhite Quail (14-Day)	9200.0	1840.0	80% Beetles Weevils Grasshoppers Etc.	20% Seeds: Ragweed Lespedeza Corn Etc.	58 ppm (k) [7]	12.0 ppm (k)	46.4 ppm [8]	2.4 ppm [9]	48.8 ppm
Bobwhite Quail (Adult)	20579.0	4116.0	27% Beetles Weevils Grasshoppers etc.	73% Seeds: Ragweed Lespedeza Corn etc.	58 ppm (k)	12.0 ppm (k)	15.7 ppm	8.8 ppm	24.4 ppm
Robin	18377.0	3675.0	40% Caterpillars Beetles Weevils Earthworms Etc.	60% Seeds/ Fruits: Cherry Dogwood Holly	58 ppm (k)	12.0 ppm (k)	23.2 ppm	7.2 ppm	30.4 ppm
Mourning Dove	16429.0	3286.0	0%	100% Seeds: Corn Pigweed Etc.	0	12.0 ppm (k)	0.0	12.0 ppm	12.0 ppm

All footnotes on page 9.

TABLE 2C.

Dietary contamination (plant animal) and total estimated residues for eight species of non-target birds.

SPECIES	CALCULATED LC_{50} (PPM)	1/5 CALC. LC_{50} (PPM) [2]	FOOD CONSUMED(%) [3] Animal	FOOD CONSUMED(%) [3] Plant	MAXIMUM EXPECTED RESIDUES [4] (PPM) Animal	MAXIMUM EXPECTED RESIDUES [4] (PPM) Plant	MAXIMUM ADJUSTED RESIDUES [5] Animal	MAXIMUM ADJUSTED RESIDUES [5] Plant	TOTAL [6] RESIDUES(ppm) Both Plant/Animal
Eastern Cowbird (Adult)	13143.0	2629	52% Grasshoppers Beetles Caterpillars	48% Seeds: Bristlegrass Oats	58.0 ppm(k)	12.0 ppm(k)	30.2 ppm [8]	5.8 ppm [9]	35.9 ppm
Field Sparrow (Adult)	5560.0	1112.0	51% Beetles Grasshoppers Caterpillars Etc.	49% Seeds: Crabgrass Bristlegrass Panicgrass Etc.	58.0 ppm(k)	12.0 ppm(k)	29.6 ppm	5.9 ppm	35.5 ppm
Grasshopper Sparrow (Adult)	5560.0	1112.0	61% Grasshoppers Caterpillars Ants Etc.	39% Seeds: Bristlegrass Ragweed Knotweed Etc.	58.0 ppm(k)	12.0 ppm(k)	35.4 ppm	4.7 ppm	40.1 ppm
Carolina Wren (Adult)	5378.0	1076.0	99% Ants Flies Millipedes Etc.	1% Seeds Poison-Ivy Pine Oaks Etc.	58.0 ppm(k)	12.0 ppm(k)	57.4 ppm	0.1 ppm	57.5 ppm

All footnotes on page 9.

FOOTNOTES FOR TABLE 2B AND 2C

/ Refer to table 1 (Footnote 6) for an explanation of how the "calculated LC_{50}'s" were obtained.

/ Application of Sec. 102.11(c)(2)(iii)(B) criterion of Sec. 3 Regulations.

/ This information is taken from:

Martin, Alexander C., et al., American Wildlife and Plants; A Guide to Wildlife Food Habits, Dover Publ., Inc., N.Y., 1951

/ Based upon a 1.00 lb. active ingredient per acre, application to expected food items using following references:

(a) Hoerger, F.D. and E.E. Kenaga, Pesticide Residues on Plants. Correlation of Representative Data as a Basis for Estimation of Their Magnitude in the Environment. Environmental Quality, Academic Press, New York, I: 9-28, 1972.

(b) Kenaga, E.E., Factors to be Considered in the Evaluation of the Toxicity of Pesticides to Birds in Their Environment, Environmental Quality and Safety, Academic Press, N.Y., II: 166-181, 1973.

5/ Residue values adjusted to reflect % animal/plant matter consumed. Examples:

(a) Bobwhite Quail, Adult:

58.0ppm x 0.27 (27%) = 15.7 ppm
12 ppm x 0.73 (73%) = 8.8 ppm

(b) Robin, Adult:

58.0ppm x 0.40 (40%) = 23.2 ppm
12 ppm x 0.60 (60%) = 7.2 ppm

6/ Reflects total residues expected in the diet: animal or plant alone or a total of animal and plant food items. Examples:

(a) Robin, Adult:

23.2 + 7.2 = 30.4 ppm total for animal and plant foods.

(b) Mourning Dove, Adult:

12 ppm total expected in food items consumed (i.e., 1.00 (100%) x 12 ppm = 12 ppm).

7/ (k) refers to maximum expected residues as per (4)(a), and (b) above.

8/ This is the maximum expected residue value for daily pesticide burden occurring from animal items.

9/ Daily pesticide burden occuring from ingested plant items.

104.5 Bentifical Insects

Data on hand at the Agency indicate that iprodione is not toxic to honey bees, even when bees are exposed to direct applications at very high rates. Thus, application to almonds in bloom should not present a hazard to bees.

Allen W. Vaughan
EPA/HED/EEB Entomologist

104.1.2 Endangered Species Consideration

Due to the low toxicity and low bioaccumulative nature of Rovral adverse effect to federally protect species are not expected.

107.0 Conclusions

107.2 Data Requests

Data referenced in Section 103 above are sufficent to support the proposed conditional registration of Rovral on Almonds.

107.2 EEB' Findings

The Ecological Effects Branch (EEB) has completed an incremental risk assessment (3(c)(7) finding) of the proposed conditional registration of Rovral (iprodione) for use on almonds. Agricultural cenus data indicates that this fungicide could be applied to at least 121,000 acres of California cropland. As such, the proposed registration of Rovral on an additional 347,159 acres of almonds could represent a significant (286 %) increase in potenital use. However, the available fish and wildlife toxicity data indicates that product registration would no pose an acute hazard to non-target organisms. Therefore, based upon the available data EEB concludes that the proposed use provides for a significant increase in exposure, but not in acute risks to non-target organisms.

Charles A. Bowen II
Fisheries Biologist
Ecological Effects Branch
Hazard Evaluation Division (TS-769)

Date: 9/3/82

Raymond Matheny
Head, Section No. 1
Ecological Effects Branch
Hazard Evaluation Division (TS-769)

Date: 9/3/82

Clayton Bushong
Chief, Ecological Effects Branch
Hazard Evaluation Division (TS-769)

Date: 9/7/82

APPENDIX I

(PRODUCT LABEL)

IPRODIONE

Page_____ is not included in this copy.

Pages 14 through 16 are not included.

The material not included contains the following type of information:

____ Identity of product inert ingredients.

____ Identity of product impurities.

____ Description of the product manufacturing process.

____ Description of quality control procedures.

____ Identity of the source of product ingredients.

____ Sales or other commercial/financial information.

X A draft product label.

____ The product confidential statement of formula.

____ Information about a pending registration action.

____ FIFRA registration data.

____ The document is a duplicate of page(s) _____.

____ The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.