113201
SHAUGHNESSEY NO.

22
REVIEW NO.

EEB BRANCH REVIEW

DATE: IN 4-23-85 OUT 5-13-85

FILE OR REG. NO. 85-WA-03

PETITION OR EXP. PERMIT NO.

DATE OF SUBMISSION 4-9-85

DATE RECEIVED BY HED 4-18-85

RD REQUESTED COMPLETION DATE 5-17-85

EEB ESTIMATED COMPLETION DATE 5-17-85

RD ACTION CODE/TYPE OF REVIEW 510/Section 18

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

DATA ACCESSION NO(S).

PRODUCT MANAGER NO. D. Stubbs (41)

PRODUCT NAME(S) Ronilan 50W

COMPANY NAME State of Washington

SUBMISSION PURPOSE Proposed Section 18 for use on caneberries in Washington State

SHAUGHNESSEY NO.	CHEMICAL, & FORMULATION	% A.I.
	Vinclozilan	50%

EEB Branch Review

Vinclozolin

100 Submission Purpose and Label Information

100.1 Submission Purpose and Pesticide Use

The State of Washington Department of Agriculture has requested a renewal of an Emergency Exemption (Section 18 action) for the use of Ronilan 50W (active ingredient vinclozolin) to control fungus on caneberries (raspberries, blackberries, youngberries, boysenberries and loganberries).

100.2 Formulation Information

Ronilan 50W

Active Ingredient

3-(3,5-Dichlorophenyl)-5-ethenyl-5-methyl-2,4-oxazolidinedione	50%
Inert Ingredients	50%

100.3 Application Methods, Directions, Rates (from proposal letter)

Dosage would be 1 to 2 lbs product (0.5 to 1.0 lb ai) per acre per application, with a maximum of 9 lbs ai/acre per season.

Ground applications will be made using at least 100 gallons of spray suspension per acre.

Treatments will commence with a first application no later than 5% bloom. Repeat applications would be made at 7-10 day intervals through harvest. The season begins May 1 and extends through July 30 with a 7-day pre-harvest interval.

100.4 Target Organism

Botrytis fruit rot (Botrytis cinerea)

100.5 Precautionary Labeling

(from Ronilan 50W label)

"Do not apply to wetlands and other water bodies. Do not contaminate water by cleaning of equipment or disposal of wastes."

100.6 Proposed Section 18 Program

The letter of request submitted by the State of Washington Department of Agriculture is appended to this review. Please refer to it for details.

100.6.1 Nature and Scope of Emergency (from submission)

Botrytis cinerea is the major causal organism of pre- and post-harvest fruit rot of caneberries. The fungus attacks flowers and canes as well as causing fruit rot. Infected canes are sensitive to weather injury.

Fungicides registered for this use include Benlate, captan, Botran and folpet. Botran and folpet have a history of ineffectiveness. Botrytis has shown resistance to Benlate in many crops. Captan has only been shown to be effective in years when climatic conditions were not favorable to disease development. An 80% control effectiveness is expected with use of Ronilan.

100.6.2 Date, Duration

Ronilan would be used from May 1 through July 30 of this year.

100.6.3 Treatment Areas

All counties west of the crest of the Cascade Mountains in the State of Washington. A maximum of 1500 acres would be treated.

101 Hazard Assessment

101. Likelihood of Adverse Effects to Nontarget Organisms

Terrestrial Species

Available acute and subacute toxicity data indicate that technical vinclozolin is practically nontoxic to birds. A single dose oral LD_{50} value in excess of 2,510 mg/kg was reported for the bobwhite quail. Eight-day dietary LC_{50}'s greater than 5,620 ppm were determined for both the bobwhite quail and the mallard.

The available acute data also indicate a low mammalian toxicity for vinclozolin. Acute oral LD_{50}'s of greater than 10 g/kg and greater than 13 g/kg were determined for rats.

Following an initial application of vinclozolin at a rate of 1.0 lb ai per acre, maximum expected residues on typical avian and mammalian dietary matter would range from 7 ppm on fruit to 240 ppm on sparse foliage. These residues are well below the acute toxicity values for waterfowl and upland bird species.

However, repeat treatments will be made at 7-10 day intervals. As many as 9 applications at the maximum rate would be allowed. Accumulated residues of vinclozolin applied at maximum rates were estimated for a variety of terrestrial wildlife dietary matter. Parameters utilized are:

Applications: 9
Rate: 1 lb ai/acre
Interval between applications: 7 days
Half-life - 7 days

Half-life of the chemical will vary with type of dietary matter exposed. A 7-day half-life was chosen because it falls between the half-life of 5 days reported for strawberries (EEB Review Out: August 27, 1979 by J. Leitzke) and the half-life of 9.4 days provided for peaches (EEB Review Out: December 16, 1982, by M. Gessner).

Residue calculations are appended. Maximum expected accumulated residues do not approach the LC_{50} criterion used to indicate acute hazard to terrestrial species.

Caneberries are an attractive food crop to wildlife. Utilization of berry fields is high for both mammalian and avian species. Acute adverse effects to wildlife are not anticipated from use of vinclozolin on caneberries, however there may be a potential for a chronic hazard, particularly to small birds.

The available data on avian reproduction suggest that this chemical begins to affect egg fertility at concentrations greater than 5 ppm. The Canadian Wildlife Service has found evidence that vinclozolin can affect avian testicular development (memo R. Balcomb August 1984). Theoretically, residues greater than 5 ppm could be retained on wildlife dietary matter throughout a 9-week intensive control program. Spraying will take place from May throughout July, a timeframe that encompasses a part of the breeding season of many passerines.

Aquatic Organisms

Unfortunately the acute toxicity data for freshwater fish are not reliable (EEB Review Out: February 20, 1980, by M. Rexrode). A precipitate formed in all the test vessels of both the bluegill and rainbow trout studies. No precipitate was reported for the study on daphnids and an LC_{50} of 3.65 ppm was determined for Daphnia magna.

Assuming a direct application to water, vinclozilan treatments at maximum recommended label rates would produce the following residues:

Depth of water (ft)	Residues (ppm)
0.5	0.734*
1.0	0.367*
2.0	0.183
3.0	0.073

* exceeds 1/10 the LC_{50} of Daphnia magna

As tabulated below, the available environmental fate information indicates that vinclozolin hydrolyzes with the shortest half-lives at alkaline pH's.

	Temperature	
pH	25°C	35°C
3	70 days	22.5 days
6	61 hours	22.5 hours
9	12.6 min.	4.8 min.

Most aquatic organisms tolerate pH of 6 to 9, thus a half-life of a few hours to a few days would be expected for vinclozilan in a warmwater environment (25°C). The half-life of the chemical could be greatly extended in coldwater habitat (12°C).

Based on the available data, significant adverse acute effects to populations of aquatic organisms are not anticipated for use of vinclozilan under this Emergency Exemption. Only 1500 acres of caneberries will be treated. Maximum rates will only be used on a portion of the total permitted area. Residues resulting from direct application of maximum label rates of the fungicide to shallow water may exceed theoretical Restricted Use triggers, however, under this use pattern, direct contamination of the aquatic environment is considered inadvertent and not a

significant route of exposure. Residues expected to reach water from drift and/or runoff should not approach trigger levels.

101.3 Endangered Species Considerations

Use of vinclozilan under this Emergency Exemption should not significantly affect populations of federally Endangered/Threatened species. With the exception of the marine Leatherback Sea Turtle, the species listed for the state of Washington are large mammals and birds. Vinclozilan is practically non-toxic to avian and mammalian species. Many of the species are predatory and would not be exposed to significant amounts of contaminated dietary matter.

101.4 Adequacy of Toxicity Data

A thorough assessment of potential hazards to aquatic organisms could not be made due to the lack of reliable acute toxicity data on freshwater fish. Note to Reviewers: Requests for acceptable data must be made at the time of the next Section 3 Registration.

There are no data relating the compound's toxicity to non-target insects.

102 Conclusions

The available data on vinclozilan indicate that use of the chemical under the proposed Emergency Exemption should not produce significant adverse effects to populations of nontarget aquatic and terrestrial wildlife including federally Endangered/ Threatened species. Please refer to Section 101 of this review for details.

Elizabeth E. Zucker 5/13/85
Elizabeth E. Zucker
Wildlife Biologist
EEB/HED

5/13/85
David Coppage
Section Head (3)
EEB/HED

5/14/85
Michael Slimak
Branch Chief
EEB/HED

Expected Residues of Vinclozolin on Vegetation Following Repeat Applications at Maximum Label Rates

Day	Fruit	Seeds/ Large Insects	Small Insects/ Forage	Leaves/ Leafy Crops	Long Grass	Short Rangegrass
0	7	12	58	125	110	240
7	10.5	18	87	187.5	165	360
14	12.25	21	101.5	218.75	192.5	420
21	13.125	22.5	108.75	234.38	206.25	450
28	13.56	23.25	112.38	242.19	213.13	465
35	13.78	23.63	114.19	245.09	216.56	472.5
42	13.89	23.81	115.09	248.05	218.28	476.25
49	13.95	23.91	115.55	249.02	219.14	478.13
56	13.97	23.95	115.77	249.51	219.57	479.06

Parameters Utilized

No. of Applications: 9
Rate: 1 lb. a.i./acre
Interval between Applications: 7 Days
Half-life of chemical: 7 Days

C. Alan Pettibone
Director

STATE OF WASHINGTON
DEPARTMENT OF AGRICULTURE
406 General Administration Bldg AX-41 • Olympia Washington 98504 • (206) 753-5063

CERTIFIED

April 9, 1985

Donald Stubbs, Head
Emergency Response Section
Registration Division
401 M Street Southwest
Washington DC 20460

RE: Emergency use of vinclozolin (Ronilan) 3-(3, 5-dichlorphenyl)-5-ethenyl-methyl-2,4-oxazolidinedione on caneberries

Section 18 of Amended FIFRA provides the Administrator may, at his discretion, exempt any state or federal agency from provisions of FIFRA if he determines emergency conditions exist which require such exemptions.

Part 166, Chapter 1, Title 40, Rules and Regulations, provides criteria for emergency exemptions. We are applying for emergency use of Ronilan 50W to control Botrytis fruit rot on caneberries (including raspberries, blackberries, Youngberries, boysenberries and loganberries).

In previous years, identical emergency exemptions have been granted for this use in Washington, as well as several emergency exemptions for other raspberry problems. On April 8, 1985, a report summarizing the amount used and results in Washington for 1984 was submitted to you.

Information requested in 40 CFR 166.3(a) and by subsequent policies is as follows:

1. Botrytis cinerea Pers. ex. Fr. is the major causal organism of both pre-harvest and post-harvest fruit rots of caneberries. In addition to rotting fruit of the berry crop, B. cinerea attacks flowers (causing blossom blight) and canes. Infected canes are more sensitive to cold injury during the winter. B. cinerea produces spores on a wide range of living tissues, plant debris, and on soil, and as a result presents a constant threat of infection. Spores are disseminated by wind and splashing rain.

Post-harvest fruit rot (rot that develops on fruit after it is harvested) is of minimal concern to growers whose crop is processed. Control of rot after harvest is vitally important to

those shipping caneberries for sale on the fresh market. In 1981, 23% of the caneberries grown in Washington were sold fresh. Since that time, the amount has increased slightly.

2. The pest to be controlled is Botrytis fruit rot (Botrytis cinerea).

3. No cultivars contain useful levels of resistance. Registered fungicides include Benlate, captan, Botran and folpet. Botran and folpet are not commonly used, as they have a history of ineffectiveness. Recent research by several workers has shown an increasing problem of Benlate resistance in Botrytis in many crops. Work by H. S. Pipin of the Agriculture Canada Research Station in Vancouver, British Columbia, has documented local benomyl tolerance in Botrytis on strawberries and indicated a similar situation developing on raspberries. (Strawberries and raspberries are usually grown in close juxtaposition in western Washington). Captan has been used with limited success in years when climatic conditions were not favorable to disease development, but no fungicide has performed acceptably when cool, moist conditions persist during flowering and into harvest.

4. Ronilan 50W, EPA reg. no. 7969-53, manufactured by BASF Wyandotte Corporation.

5. (i) Dosage would be 1 to 2 lb. formulated product (0.5 to 1.0 lb. a.i.) per acre per application, with a maximum of 9 lb. a.i./acre per season. A maximum of 1500 acres would be treated, resulting in maximum possible usage of 13,500 lb. of active ingredient. Actual usage, of course, is anticipated to be considerably less, but depends on unpredictable early season weather.

(ii) All counties west of the crest of the Cascade Mountains.

(iii) Ground application only, using at least 100 gallons of spray suspension per acre.

(iv) Application should commence with a first application no later than 5% bloom. Repeat applications at 7-10 day intervals through harvest. First application should commence no later than May 1, and the season should extend through July 30. A seven (7) day preharvest interval is requested.

(v) Application by licensed commercial applicators or qualified growers.

6. Economic benefits and losses:

Most of the commercial caneberry production in Washington state is red raspberries, for which some economic data has been developed.

Whenever available, blackberry data has been included, although we estimate very little commercial blackberry acreage would be treated. Data past 1982 is unobtainable. The amount of other caneberries in Washington is probably negligible; however, those that do occur are very important to individual growers.

a. Production costs for caneberries are not available on a statewide basis. It has been estimated that a raspberry field must produce for a minimum of five years for a grower to recover establishment costs. The Washington Red Raspberry Commission has estimated their production costs for red raspberries at approximtely $0.66/lb.

b. Crop yields (over 13,000 tons of red raspberries were produced in Washington and Oregon 1980. This represented 80% of the total U.S. production).

Year	Acreage Harvested	Yield/acre lbs.	Utilized Production/lbs.
Red Raspberries			
1980	2,800	4,500	12,600,000
1981	2,800	4,750	13,300,000
1982	2,800	5,650	15,820,000
1983	2,600	5,540	14,404,000
1984	2,750	5,820	16,300,000
Blackberries			
1980	200	3,500	840,000
1981	240	3,750	825,000
1982	200	3,750	750,000

c. Price received:

Year	Cents/lb.	Value of Crop ($)
Red raspberries		
1980	37.3	4,700,000
1981	52.0	6,916,000
1982	67.9	10,745,300
1983	45.2	6,511,000
1984	47.5	7,742,500
Blackberries		
1980	15.8	133,000
1981	22.5	185,600
1982	19.0	142,500

d. Estimation of the percent control of the pest with registered pesticides: On small acreage crops such as caneberries, this information is unavailable, particularly (as in the case of Botrytis) when a part of the crop loss is due to infection of the blossom, so that fruit never sets, and part is due to rotting of fruit already formed. In years when moist, cool weather continues through flowering, losses of 50% can occur. In 1977, 1980 and 1981, significant losses resulted despite use of captan and benomyl. In 1982 and 1984, favorable weather conditions resulted in less than average disease pressure. Only fields with an unusually bad history of Botrytis or other unusual disease-promoting conditions were treated. These fields responded very well to the treatment.

e. Estimations of disease control under field conditions with Ronilan generally run about 80%.

BASF has submitted a request for federal registration for this use in the last year. It is identified as petition #6F2934.

The knowledgeable expert to contact for further information is Dr. Pete Bristow, Western Washington Research & Extension Center, Puyallup, Washington. The phone number is 206/593-8519.

If you have any questions, please contact this office at 206/753-5064.

Sincerely,

Mary Martin Toohey, Chief
Registration & Services
Ag Chemical Branch

MMT/lm

cc: Pete Bristow
Dick Maxwell
Lyn Frandsen
Craig McConnell
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Bob Mitchel
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Dis 61 Item 26
cert 830492
4-26-84

ATTN: MR. GLENN E. SMERDON
GRAIN AND CHEMICAL DIVISION

THE ENVIRONMENTAL PROTECTION AGENCY HEREBY GRANTS A SPECIFIC EXEMPTION UNDER THE PROVISIONS OF SECTION 18 OF THE FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT, AS AMENDED, TO THE WASHINGTON DEPARTMENT OF AGRICULTURE FOR THE USE OF VINCLOZOLIN TO CONTROL BOTRYTIS FRUIT ROT ON CANEBERRIES (INCLUDING RASPBERRIES, BLACKBERRIES, YOUNGBERRIES, BOYSENBERRIES, AND LOGANBERRIES). THIS SPECIFIC EXEMPTION IS SUBJECT TO THE FOLLOWING CONDITIONS AND RESTRICTIONS:

1. THE WASHINGTON DEPARTMENT OF AGRICULTURE IS RESPONSIBLE FOR ENSURING THAT ALL PROVISIONS OF THIS SPECIFIC

EXEMPTION ARE MET. IT IS ALSO RESPONSIBLE FOR PROVIDING INFORMATION IN ACCORDANCE WITH 40 CFR 166.5. THIS INFORMATION MUST BE SUBMITTED TO EPA HEADQUARTERS THROUGH THE EPA REGIONAL OFFICE.

2. THE PRODUCT RONILAN 50W (EPA REG. NO. 7969-53), MANUFACTURED BY BASF WYANDOTTE CORPORATION, MAY BE APPLIED. ALL APPLICABLE DIRECTIONS, RESTRICTIONS, AND PRECAUTIONS ON THE EPA-REGISTERED PRODUCT LABEL MUST BE FOLLOWED.

3. RONILAN 50W SHOULD ONLY BE APPLIED WHEN CLIMATIC CONDITIONS (COOL AND MOIST) FAVORABLE TO DISEASE DEVELOPMENT PERSIST DURING FLOWERING AND INTO HARVEST.

4. APPLICATIONS WILL BE BY GROUND AT A RATE OF 1 TO 2 LB. PRODUCT (0.5 TO 1.0 LB A.I.) PER ACRE. A MAXIMUM OF 9 LB. A.I. WILL BE APPLIED PER ACRE PER SEASON.

5. A TOTAL OF 13,500 LB. A.I. WILL BE USED TO TREAT A MAXIMUM OF 1,500 ACRES.

6. A PRE-HARVEST INTERVAL OF SEVEN DAYS WILL BE OBSERVED.

7. APPLICATIONS MADE IN ACCORDANCE WITH THE ABOVE PROVISIONS ARE NOT EXPECTED TO RESULT IN RESIDUES OF VINCLOZOLIN AND ITS 3,5-DICHLOROANILINE METABOLITES IN OR ON CANEBERRIES IN EXCESS OF 10 PPM. CANEBERRIES WITH RESIDUES OF VINCLOZOLIN NOT EXCEEDING THIS LEVEL MAY ENTER INTERSTATE COMMERCE. THE FOOD AND DRUG ADMINISTRATION, DHHS, HAS BEEN ADVISED OF THIS ACTION. ANALYTICAL METHODOLOGY IS AVAILABLE FROM RESIDUE CHEMISTRY BRANCH, HED, EPA, 401 M. STREET, S.W., WASHINGTON, D.C. 20460.

8. THE EPA SHALL BE IMMEDIATELY INFORMED OF ANY ADVERSE EFFECTS RESULTING FROM THE USE OF THIS PESTICIDE IN CONNECTION WITH THIS EXEMPTION.

9. A REPORT SUMMARIZING THE RESULTS OF THIS PROGRAM MUST BE SUBMITTED BY JANUARY 31, 1985.

10. THIS SPECIFIC EXEMPTION EXPIRES JULY 31, 1984.

ANY FUTURE CORRESPONDENCE IN CONNECTION WITH THIS EXEMPTION SHOULD REFER TO FILE SYMBOL 84-WA-07.

Susan H. Thurman

for EDWIN L. JOHNSON, DIRECTOR
OFFICE OF PESTICIDE PROGRAMS

DATE: 25 APRIL 1984