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SHAUGHNESSY NO.

REVIEW NO.

EEB REVIEW

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PETITION OR EXP. PERMIT NO. \_\_\_\_\_

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RD ACTION CODE/TYPE OF REVIEW \_\_\_\_\_ 510

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

DATA ACCESSION NO(S). \_\_\_\_\_

PRODUCT MANAGER NO. \_\_\_\_\_

PRODUCT NAME(S) Goal

COMPANY NAME Washington Dept. of Agriculture

SUBMISSION PURPOSE Specific exemption - use on raspberries  
to suppress primocanes

SHAUGHNESSY NO.	CHEMICAL & FORMULATION	% A.I.
<u>111601</u>	<u>Oxyflurofen</u>	<u>19.4</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

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EEB REVIEW

Chemical: Oxyfluorfen (Goal)

100 Submission Purpose and Label Information

100.1 Submission Purpose and Pesticide Use

The State of Washington is requesting an emergency exemption (Section 18) for the use of Goal to suppress red raspberry primocane growth.

100.2 Formulation Information

ACTIVE INGREDIENTS:

Oxyflurofen ..... 19.4%

INERT INGREDIENTS: . . . . . 80.6%

100.3 Application Methods, Directions, Rates

Application Information

Proposed use in red raspberries for primocane suppression. Exemption allows one application per season at a maximum rate of 2 pints per acre (0.4 lb ai), ground application only when primocanes are emerged 4 to 6 inches. Applied as a directed spray toward the base of the plant. See attached document for additional information.

100.4 Target Organisms

Red raspberry primocanes.

100.5 Precautionary Labeling

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

This product is highly toxic to aquatic invertebrates, aquatic plants, wildlife, and fish. Use with care when applying in areas frequented by wildlife or adjacent to any body of water or wetland area. Do not apply when weather conditions favor drift or erosion from target areas.

101 Hazard Assessment

101.1 Discussion

The state of Washington is requesting an emergency exemption for the use of Goal to suppress primocane growth on red raspberries. One application will be allowed. Proposed rate is 1 to 2 pt/A (equivalent to 0.2 to 0.4 lb oxyflurofen per acre) applied in early April through May.

This request is for use on a maximum of 5,200 acres in counties west of the Cascade mountains (Whatcom, San Juan, Skagit, Snohomish, Clallam, Grays Harbor, Island, Jefferson, King, Kitsap, Mason, Pierce, Thurston, Lewis, Cowlitz, Pacific, Skamania, Wahkiakum, and Clark).

101.2 Likelihood of Adverse Effects on Nontarget Organisms

Terrestrial Organisms

Data from previous EEB reviews indicate that oxyflurofen is practically nontoxic to mammals and waterfowl (mallard duck LC<sub>50</sub> >4000 ppm, mammalian LD<sub>50</sub>'s > 5000 mg/kg) but the herbicide is highly toxic to bobwhite quail (LC<sub>50</sub> 390 ppm). Oxyflurofen did not affect avian reproduction in bobwhite quail and mallard ducks at 100 ppm.

Maximum residues<sup>1/</sup>, based on the nomograph of Kenaga and Hoerger (1972), were calculated to be as follows:

<u>Substrate</u>	<u>Residue(ppm)</u>
Short rangegrass	312.0
Long grass	143.0
Leaves and leafy crops	162.5
Forage	75.4
Pod containing seeds	15.6
Fruit	9.1

These levels are below calculated or laboratory determined toxicity values for mammals and waterfowl. However, 1/5 the lowest avian LC<sub>50</sub> value (78 ppm), exceeds the trigger for restricted use on grasses and leafy crops. This will not

<sup>1/</sup> Based on a conversation with Stott Howard, WSU Northwest Washington Research Center, Mount Vernon, WA (206)424-6121, red raspberries are grown on a 10 foot row spacing and Goal will be applied in a 15 inch band on either side of the row. Rate within the band would therefore be equivalent to 1.3 lb ai/A.

be necessary for the following reasons:

- ° This is a onetime exemption on a relatively limited acreage using a banded material.
- ° Residues may not remain at the concern level for 5 days. Rain and other natural conditions would reduce the residues.
- ° Upland birds do not typically feed in one site for 5 days on an exclusive diet of grass and leafy crops.

Mammals are not expected to be adversely affected.

#### Aquatic Organisms

Oxyflurofen is highly toxic to freshwater fish (bluegill sunfish LC<sub>50</sub> 200 ppb, rainbow trout LC<sub>50</sub> 410 ppb), highly toxic to shrimp (LC<sub>50</sub> 31.7 ppb), and moderately toxic to aquatic invertebrates (Daphnia magna LC<sub>50</sub> 1.5 ppm). The MATC for fish is >38 <74 ppb. Estimated environmental concentration (EEC) should be 2.4 ppb<sup>2/</sup> in a pond six feet deep following 1% runoff from 10 acres receiving an application of 0.4 lb ai/acre. This value is less than the lowest aquatic LC<sub>50</sub> and does not exceed the 1/10 LC<sub>50</sub> trigger for restricted use classification using the most sensitive test species. On the basis of these figures, the proposed use of oxyflurofen will not result in hazard to aquatic organisms.

$$2/ 0.4 \text{ lb} \times 10 \text{ acre} \times 1\% \times 61 \text{ ppb} = 2.4 \text{ ppb}$$

#### Nontarget Plants

Nontarget plant data are unavailable for oxyflurofen.

The potential exists for herbicides to move from the site of application through drift, volatilization, and runoff. Goal will not be applied aerially, the material is not considered volitile (vapor pressure <1 x 10<sup>-5</sup> mm Hg at 25°C) and runoff is considered to be of minor concern based on the low water solubility (0.1 ppm), high soil adsorbtion, and low use rate. Consequently, the hazard to nontarget plants is expected to be minimal.

### 101.3 Endangered Species Considerations

On the basis of information in its endangered/threatened species files, EEB has determined that six birds, two mammals, and one insect could be associated with the counties for which the exemption is being requested (bald eagle, American peregrine falcon, Arctic peregrine falcon, Aleution Canada goose, Northern spotted owl, brown pelican, grizzly bear, Columbian white-tailed deer and the Oregon silverspot butterfly).

Hazard to mammals from exposure is considered to be minimal based on low toxicity.

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Using the lowest avian LC<sub>50</sub> value (bobwhite quail 390 ppm), the endangered species trigger for birds would be exceeded (1/10 390 ppm = 39 ppm, maximum residues range from 9.1 to 312 ppm). Of the avian species listed, only the Aleution Canada goose, which has been identified as possibly occurring in King and Pacific counties, might be impacted by this use. However, Ms. Ann Metzger, Administrator, Red Raspberry Commission, (206) 671-1437 informed me that no red raspberry growers were identified in Pacific county and only 27 acres of berries were grown in King county. Based on this limited acreage, the probability of the Aleution Canada goose being adversely affected is considered unlikely.

The Oregon silverspot butterfly is found only along the coast (Pacific county) in association with saltspray meadows with conifer/brush fringe areas. The likelihood of exposure from this use pattern is remote.

#### 101.4 Adequacy of Toxicity Data

The existing data base is adequate to assess the hazard to nontarget organisms for this Section 18.

#### 101.5 Adequacy of Labeling

No label was submitted with the request, although EPA Reg. No. 707-174 was cited.

#### 103 Conclusions

EEB has reviewed the proposed emergency exemption for the use of Goal in Washington for red raspberry primocane suppression.

Mammals, birds, aquatic organisms, and nontarget plants are not expected to be adversely affected by this exemption.

Endangered/threatened species are not expected to be impacted.

*Charles Lewis 2/15/90*

Charles R. Lewis  
Ecological Effects Branch  
Environmental Fate and Effects Division (H7507C)

*M. Reprode for Stavola 2/17/90*

Ann M. Stavola, Acting Section Head  
Ecological Effects Branch  
Environmental Fate and Effects Division (H7507C)

*James W. Akerman 2/20/90*

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

To: RSERB (EPA7356)  
To: PTSCB/REG.X (EPA9045)  
To: OR/DOA/PD (EPX4675)

From: WA/DOA (EPX5675) Delivered: Fri 19-Jan-90 18:30 EST  
Sys 163 (239) Subject: Section 18 Request for Goal on Raspberries  
Mail Id: IPM-163-900119-166550929

CERTIFIED

January 19, 1990  
Rebecca Cool  
Emergency Response Section  
Registration Division (TS-767)  
401 M Street SW  
Washington DC 20460

RE: Specific exemption for use of oxyfluorfen (Goal), 2-chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl) benzene on raspberries

Section 18 of FIFRA provides the Administrator may, at his discretion, exempt any state or federal agency from provisions of FIFRA if he determines that emergency conditions exist which require such exemption. We are applying for a specific exemption for use of oxyfluorfen (Goal) to suppress primocanes in red raspberries.

Information required in 40 CFR 166.20(a) is as follows:

1) Contact people:

technical and scientific aspects:

Stott Howard  
WSU Northwest Washington Research Center  
1468 Memorial Highway  
Mount Vernon, WA 98273-9788  
(206) 424-6121

J. Scott Cameron  
WSU Southwest Washington Research Center  
1919 NE 78th Street  
Vancouver, WA 98665  
(206) 696-6018

economic aspects:

Frank DeVries  
Washington Red Raspberry Commission  
1333 Lincoln Street, No. 182  
Bellingham, WA 98226  
(206) 671-1437

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2) Description of the pesticide:

a) Goal 1.6E Herbicide, registered by Rohm & Haas, EPA reg. no. 707-174.

b) Goal herbicide is a very potent inhibitor of primocane growth. One application of Goal at 1 to 2 pint/A will provide sufficient temporary suppression of early-season red raspberry primocane growth. Addition of a nonionic surfactant at 0.25% may be used. Goal should be applied as a directed spray toward the base of the red raspberry plants when primocanes are emerged 4 to 6 inches. Mounted nozzles should be used to deliver a total spray volume of 30 gallons/A. Lower rates should be used if plantings appear weak or slightly stressed. Care should be taken to avoid application to excessively weak or stressed plantings or primocane regrowth may be insufficient for the following year's crop. Occasionally after the use of Goal herbicide to temporarily suppress red raspberry primocane, a 'spotting' or 'flecking' may appear on the lower leaves of the floracanes. This has not affected red raspberry plant health, performance, or yield.

3) a) Counties west of the Cascade mountains: Whatcom, San Juan, Skagit, Snohomish, Clallam, Grays Harbor, Island, Jefferson, King, Kitsap, Mason, Pierce, Thurston, Lewis, Cowlitz, Pacific, Skamania, Wahkiakum and Clark.

b) ground application only - no irrigation or aerial application.

c) maximum of one application; maximum of 2 pint (0.4 lb ai).

d) maximum of 5,200 acres.

e) maximum of 1,300 gallons of formulation, or 2,080 lb ai.

f) use pattern should not be limited to a calendar time frame, rather they should be indicated by stage of primocane emergence. Primocanes should be emerged 4 to 6 inches. This generally occurs from early April through May. Unusual growing weather in spring could require earlier application.

4) Dinoseb was used to temporarily suppress the growth of red raspberry primocanes. This technique would significantly increase berry size and facilitate machine harvesting, thus substantially increasing yield. Currently, the only material registered for temporary primocane suppression is monourea sulfuric acid (Enquik), a product manufactured by Unocal. This material was granted a 24(c) (WA89009) registration by the Washington State Department of Agriculture in 1989. It is ineffective for the following reasons: 1) its activity is temperature dependent. In trials throughout western

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Washington it was shown to be very ineffective when compared to dinoseb or oxyfluorfen, for the initial primocane suppression treatment because ambient temperatures were not conducive to good activity; 2) the use of Enquik can cause crippling of the primocanes rather than suppression. The end result here is that the developing primocanes continue to be a photosynthetic sink that competes with the berries. In addition the crippled canes obstruct the machine harvesting operations. Further, they are weak and incapable of producing adequate fruit yield next year. Finally, these weakened, crippled primocanes are targets for disease and insect infestations. The overall result, therefore, would be a significant loss of plant productivity.

- 5) Efficacy can be supported by Stott Howard and J. Scott Cameron.
- 6) Residue work has been completed and has been submitted by IR-4.
- 7) Risk information is addressed in Rohm & Haas data currently in EPA, both pending in various petitions and reviewed for the food uses and tolerances currently granted for oxyfluorfen. We have not examined this data.
- 8) The Food Quality Assurance Division of the Washington State Department of Agriculture and the Washington State Department of Health have been forwarded a copy of this request.
- 9) Rohm & Haas has been notified of this specific exemption request.
- 10) The Washington State Department of Agriculture has adequate authority for enforcing provisions of Section 18's and has been doing so for many years. We would be glad to answer any more specific questions regarding our enforcement program.

Information required in 40 CFR 166.20(b) is as follows:

- 1) The primary use under this specific exemption will be for primocane growth control suppression, not for pest control.
- 2) The emergency exists because the EPA suspended the use of dinoseb, which was the only effective material that was registered for temporary red raspberry primocane suppression. Therefore, a void exists for this red raspberry production need. Dinoseb has been the only material used since the technique of temporary primocane suppression (referred to as 'cane burning' by growers) was integrated into red raspberry culture to increase yield and facilitate machine harvesting. The primocanes are part of the red raspberry (*Rubus idaeus* L.).

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3) It is not anticipated that this use will pose any significant hazard to endangered species.

4) a) 1989 total red raspberry acreage was approximately 4,800. 1990 estimated acreage is 5,200.

b) Crop production costs:

Year	Average Yield/A	Break-even \$-- cents/#	\$/Ton
1986	4200	63.2	1264
1987	6400	47.1	942
1988	5760	50.3	1006
1989	5900	58.0	1160

c) Crop Yields:

Year	Pounds
1986	13,860,000
1987	23,040,000
1988	24,093,000
1989	28,500,000

d) Pesticide not used for pest control but plant growth regulation.

e) Economic value of red raspberries to Washington:

Year	Dollars
1986	\$10,509,000
1987	12,109,000
1988	13,482,000
1989	14,962,000

f) Price received for red raspberries:

Year	Cents/#	\$/10
1986	75.8	3,183.60
1987	52.6	3,366.40
1988	50.0	2,880.00
1989	52.5	3,097.50

g) Temporary suppression of red raspberry primocanes in the spring significantly increases yield by: reducing competition between the developing berries and primocanes for photosynthate, thus increasing berry size, and allowing the "catch-plates" of the mechanical harvesters to collect fruit without interference from developing primocanes. The suppression of primocanes with Goal would

allow growers to maintain their present yields. Without suppression of primocanes, yield may be reduced up to 45%.

If you need further information concerning this request, please contact me at (206) 753-5064.

Sincerely, -

PESTICIDE MANAGEMENT DIVISION

Glenn E. Smerdon  
Program Manager  
Registration & Licensing

GES/s

cc: Stott Howard  
J. Scott Cameron  
Frank DeVries  
Dick Maxwell  
John Daly  
Jon Heller  
Bob Mitchell  
Ted Maxwell  
Lynden Baum  
Dick Cissell

//