

RECORD NO.

109303
SHAUGHNESSEY NO.

7
REVIEW NO.

EEB REVIEW

DATE: IN 11/23/88

OUT 12/06/88

FILE OR REG. NO 88-TX-02

PETITION OR EXP. NO

DATE OF SUBMISSION: 11-10-88

DATE RECEIVED BY EFED: 11/23/88 (Date Assigned: 11/29/88)

RD REQUESTED COMPLETION DATE: 12/07/88

EEB ESTIMATED COMPLETION DATE: 12/07/88

RD ACTION CODE/ TYPE OF REVIEW: S10

TYPE PRODUCT(S): Systhetic Pyrethroid

ACCESSION NUMBER(S): n/a

PRODUCT MANAGER: D. Stubbs (41)

PRODUCT NAME(S): Asana® esfenvalerate

COMPANY NAME: State of Texas

PURPOSE OF SUBMISSION: Section 18 for use on leafy vegetables:
kale, kohlrabi, mustard greens.

SHAUGHNESSEY NO.

CHEMICAL AND FORMULATION

%A.I.

ECOLOGICAL EFFECTS BRANCH REVIEW

Asana® esfenvalerate

100 Submission Purpose and Label Information

100.1 Submission Purpose and Pesticide Use

The State of Texas is requesting a Section 18 Emergency Exemption under the Federal Insecticide, Fungicide and Rodenticide Act to allow the use of Asana for the control of cabbage loopers in leafy vegetables.

During the past three years, the Texas Department of Agriculture (TDA) has received a Section 18 authorization from EPA to allow permethrin for the control of cabbage loopers. Mr. Mike Moeller, Deputy Commissioner of TDA, states in his letter that no pesticide product is presently registered for use in all leafy greens which will effectively control cabbage loopers; although, Asana is under consideration.

100.2 Formulation Information

EPA Reg. No. 352-515, Asana® XL insecticide (Dupont)

100.3 Application Methods, Directions, Rates

Esfenvalerate may be applied with ground or aerial equipment at the maximum rate of 0.05 lb a.i./Acre per application. A maximum of three applications per cutting of leafy vegetables may be made. No more than two cuttings of vegetables shall receive treatments with esfenvalerate. Timing and frequency of use will be determined by cabbage looper infestation.

A cumulative maximum of 1400 acres of Kale, kohlrabi, and mustard greens may be treated with esfenvalerate in the Texas counties of Hidalgo, Frio, Uvalde, Zavala, Starr, Cameron, Willacy, Gaines, and Yoakum. The maximum quantity of esfenvalerate required for this exemption will be 420 lbs, which is equivalent to 636 gallons

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of Asana® XL insecticide.

100.5 Environmental Hazard Precautionary Labeling

Esfenvalerate shall not be applied where runoff is likely to occur to aquatic habitats or when weather conditions favor runoff from treated areas.

Note, the label should read:

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

101 Hazard Assessment

101.1 Discussion

The State of Texas is requesting an emergency exemption for the use of fenvalerate on leafy vegetables. Fenvalerate is currently registered for use on a number of crops such as, beans, corn, cotton, peanuts, soybeans, and potatoes. The registered application rates range from 0.05 to 0.3 lbs a.i./Acre. A total of 0.4 to 2.0 lbs a.i./A/season is the maximum cumulative amount that may be applied in a year.

The active ingredients will be applied up to 6 times at a maximum rate of 0.05 Lbs/A. Following a single application of 0.05 Lbs AI /A, the following maximum residues are anticipated:

	<u>Residues (ppm) 0.05 Lbs/A</u>
short range grass	12 ppm
long grass	5.5
leaves and leafy crops	6.3
forage, small insects	3.0
Pods containing seeds	0.6
fruit, cherries, peaches	0.35
Soil Surface	
(after direct application)	1.1 ppm
Upper 6" water	
(after direct application)	36.7ppb
6' water	
(after direct application)	3.06 ppb

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101.2 Likelihood of Adverse Effects to Nontarget Organisms

Esfenvalerate is a synthetic pyrethroid insecticide. It is a metabolite of fenvalerate. Presently we do not have sufficient toxicity data for esfenvalerate; however, Don Stubbs of EPA has agreed to accept environmental fate and toxicity for fenvalerate in lieu of esfenvalerate for this proposed exemption.

Terrestrial Species

Fenvalerate is relatively non-toxic to birds (LC50= 10,000 ppm). Therefore the above terrestrial residues are not anticipated to have an adverse effect.

Aquatic Species

Fenvalerate is very-highly-toxic to aquatic species:

rainbow trout	96 hr LC50	6.2 ppb	
bluegill	96 hr LC50	0.64 ppb	
Atlantic silverside	96 hr LC50	0.31 ppb	
daphnids	48 hr LC50	<1.6 ppb	
mysid	96 hr LC50		8 pptr

In a calculated worst case scenario for a single application, the proposed maximum application rate (0.05 Lbs ai/A) would result in an aquatic concentration of 37ppb in water 0.5 feet deep, and 3.1ppb in water 6 feet deep (assuming direct application to water with 100 percent efficiency). The threshold of concern for aquatic species is exceeded with a direct application of this pesticide to 6 inches and 6 feet of water.

The estimated aquatic concentration resulting from spray drift and runoff of a single application is .34ppb (Attachment A), which also exceeds the threshold of concern for direct effects to non-target estuarine and aquatic species (i.e., $EEC \geq \frac{1}{2}LC50$, $.34ppb \geq \frac{1}{2}(LC50$ for bluegill, silversides, and mysids)).

Fenvalerate has the potential for water contamination. Degradation experiments show that fenvalerate is relatively persistent in the environment. It is stable to photolysis ($t_{\frac{1}{2}}$ water= 41 days, soil= 21 days); soil degradation is relatively slow ($t_{\frac{1}{2}}$ aerobic= 2-8 months, anaerobic= 6 months); and field dissipation is also relatively slow ($t_{\frac{1}{2}}$ =1-2 months). Esfenvalerate has the potential to enter aquatic environments through runoff with soil particles, and through spray drift. According to the exposure calculations (Attachment A), spray drift or runoff from a single application

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has the potential to cause concentrations that exceed the acute risk criteria. Furthermore, because up to 6 applications of esfenvalerate will be used, the potential for exceeding the threshold levels of concern on a chronic basis is high.

101.3 Endangered Species Considerations

No endangered fish or aquatic invertebrate species are known to occur in these counties. Endangered vertebrates are not anticipated to be at risk.

101.4 Adequacy of Toxicity Data

The data appear to be adequate, assuming fenvalerate and esfenvalerate have similar toxicities.

101.5 Adequacy of Labeling

(see Section 100.5).

102. Conclusions

The Ecological Effects Branch (EEB) has reviewed the proposed Section 18 Emergency Exemption for esfenvalerate use on leafy vegetables in Texas. According to the exposure calculations (Attachment A), spray drift or runoff from a single application will exceed the acute risk criteria established from toxicity data for fenvalerate. In addition, if multiple applications of esfenvalerate will be used, the potential for exceeding the threshold levels of concern on a chronic basis is also high.

 7 Dec 88
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 12/7/88
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Attachment A
Calculation Sheet for Estimated Environmental Concentration (EEC)

1. For foliar application:

Runoff

$$\underline{\hspace{1cm}} \text{ lbs} \times \underline{0.0\hspace{1cm}} \text{ (\% runoff)} \times \underline{10 \text{ Acres}} \text{ (drainage basin)} = \underline{\hspace{1cm}} \text{ lbs total runoff}$$

EEC of 1 lb a.i. direct application to a 1 acre pond 6-feet deep = 61ppb.

$$\text{EEC} = 61\text{ppb} \times \underline{\hspace{1cm}} \text{ lb} = \underline{\hspace{1cm}} \text{ ppb}$$

2. For aerial application:

A. Runoff

$$\underline{0.05} \text{ lbs} \times \underline{0.6} \text{ (efficiency)} \times \underline{0.01} \text{ (runoff)} \times \underline{10 \text{ Acres}} = \underline{0.003} \text{ lbs total runoff}$$

B. Spray Drift

$$\underline{0.05} \text{ lbs} \times \underline{0.05} \text{ (\% drift)} = \underline{.0025} \text{ lbs total drift}$$

$$\text{Total loading} = \underline{0.003} \text{ lbs runoff} + \underline{.0025} \text{ lbs drift} = \underline{.0055} \text{ lbs}$$

$$\text{EEC} = 61\text{ppb} \times \underline{.0055} \text{ lbs} = \underline{.3355} \text{ ppb}$$