

12/2/86 Draft Doc # 5

PC-128910  
128911

ECOLOGICAL EFFECTS  
BRANCH REVIEW

100 SUBMISSION PURPOSE AND LABEL INFORMATION

100.1 SUBMISSION PURPOSE AND PESTICIDE USE

Fermone Chemicals Incorporated has applied for full registration of its product, Stirrup-M, for use as a pheromone against mites. This product is designed to be used as an additive to other registered miticides and acts as an attractant. The applicant claims that this product has no inherent pesticidal properties.

100.2 FORMULATION INFORMATION

Stirrup-M is composed of two active ingredients, farnesol and neurolidol, which are active as a mite attractant only when they are combined.

<u>Ingredient</u>	<u>Percent (w/w)</u>
<u>Active</u>	
3,7,11-Trimethyl-2,6,10-dodecatriene-1-ol (farnesol)	0.972
3,7,11-Trimethyl-1,6,10-dodecatriene-3-ol (neurolidol)	0.788
<u>Inerts</u>	
Total	98.240 100.000

100.3 APPLICATION METHODS, DIRECTIONS, RATES (excerpted from label)

MIXING

Stirrup-M must be tank-mixed in water or emulsified vegetable oil with any registered pesticide. Shake well prior to use. Add Stirrup-M last to spray tank; mix thoroughly. For best results, apply immediately after mixing.

METHOD OF APPLICATION

Stirrup-M may be applied by any conventional hand-operated, ground or aerial application equipment.



## RATE OF APPLICATION

The recommended rate of application of Stirrup-M for all crops is 2 to 6 ounces per acre. (145 to 435 ml per HA).

## RECOMMENDED APPLICATIONS

### CROPS:

Field and Vine: alfalfa, beans, blackberries, boysenberries, cantelopes, corn, cotton, cranberries, cucumbers, dewberries, eggplant, grapes, hops, kumquats, loganberries, melons, mint, peanuts, peppers, potatoes, pumpkins, raspberries, sorghum, squash, strawberries, sugarbeets, tomatoes, and watermelons.

Tree Fruits and Nuts: almonds, apples, apricots, cherries, chestnuts, figs, filberts, grapefruit, lemons, limes, macadamia, nectarines, oranges, peaches, pears, pecans, plums, prunes, quince, tangelos, tangerines, walnuts.

Greenhouse and Outdoor Ornamentals: None listed

### DIRECTIONS:

Use higher rates of spray when population pressure increases and when applying spray volume in excess of 10 gallons per acre.

Apply a minimum of two (2) applications of Stirrup-M mixed with a miticide(s) at application intervals recommended by the selected miticide label. Reapply as necessary to maintain control and/or after rainstorms.

## 100.4 TARGET ORGANISM

Tetranychid mite species (specific species not identified)

## 100.5 PRECAUTIONARY LABELING

"Do not contaminate water by cleaning of equipment or disposal of wastes" appears on the draft label.

## 101. HAZARD ASSESSMENT

### 101.1 DISCUSSION

Stirrup-M is a mite-attracting pheromone formulation which is composed of two synthetic trimethyldodecatrienol isomers in roughly equal concentrations. Together, they represent less than 2 percent (w/w) of the total formulation. This product is intended to be added to tank mixes of miticides and is used primarily as an attractant. Unlike most pheromones, this product is to be sprayed over the entire

crop area.

#### 101.1 LIKLIHOOD OF ADVERSE EFFECTS TO NONTARGET ORGANISMS

The maximum rate of application of Stirrup-M, according to the label, is 6 ounces of formulated product per acre. This equates to approximately 0.007 lb per acre. The labeling is not at all clear as to the maximum number of applications per season because this product is intended to be used as an additive to miticides and thus, depends on their application frequency. However, a reasonable estimate of the number of applications per season can be made based on the generation time of mites, which is about three weeks. Thus, if one assumes that this product will be applied once a generation over a four-month growing season, then one would expect to see approximately six applications per growing season.

There is no data on the breakdown rate of the active ingredients in this product. Therefore, to be on the safe side, the following exposure analysis assumes that there will be no, or minimal, breakdown during the growing season. The season-long application rate, using these assumptions, would then be 0.042 lb/acre.

#### Aquatic Exposure

The estimated environmental concentration of Stirrup-M expected in an aquatic ecosystem is defined by the formula:

$$EEC = \frac{(\text{Application Rate})(\text{Drainage Basin})(\text{Percent Runoff})}{(\text{Pond Area})(\text{Depth})(\text{sq. ft./A})(\text{lbs water/cu. ft.})}$$

$$EEC = \frac{(0.042 \text{ lb./A})(10 \text{ A})(0.05)}{(1 \text{ A})(6 \text{ ft.})(43560 \text{ sq.ft./A})(62.36 \text{ lb/cu.ft})}$$

$$EEC = \frac{0.021}{16298410} = 1.29 \text{ ppb}$$

This estimated exposure is well under the lowest aquatic toxicity value (1.8 ppm) by more than a thousand fold.

#### Avian Exposure

Exposure of birds by residues on foliage was determined using the nomogram developed by Hoeger and Kenaga, 1972. The estimated residue of Stirrup-M on foliage after six applications would be 5.4 ppm and the expected maximum residue on fruit would be 310 ppb.

The toxicity data submitted shows that the active ingredients in Stirrup-M are practically nontoxic to birds either by acute ingestion or when fed in the diet. Acute LD50s were >2000 mg/Kg and dietary LC50s were >5000 ppm. Thus, there appears to be no hazard to birds.

#### Nontarget Insect Exposure

Although there is no defined data requirement in this area, any adverse effects to nontarget insects, especially nontarget mites, should be submitted. In this case, since the product is used as an attractant to lure mites to a miticide, any evidence that this product affects (attracts) nonpest mites should be submitted to the Agency forthwith.

#### 101.3 ENDANGERED SPECIES CONSIDERATION

Based on the information available, there appears to be no hazard to endangered aquatic and avian species. There were no insect toxicity data submitted with this application. However, owing to the extreme specificity of pheromones in general, and the fact that currently there are no endangered mites, EEB expects that there will not be a hazard to endangered insects.

#### 101.4 ADEQUACY OF THE TOXICITY DATA

Toxicity data were submitted for both active ingredients, farnesol and neurolidol, contained in Stirrup-M. All tests followed the procedures recommended in EPA's Pesticide Assessment "Guidelines: Subdivision M and were considered to be "core" studies. The LD50s and LC50s for these active ingredients are listed below.

Test	Toxicity	
	Farnesol	Neurolidol
Avian Acute (mallard)	>2000 mg/Kg	>2000 mg/Kg
Avian acute (bobwhite)	>2000 mg/Kg	>2000 mg/Kg
Avian dietary (mallard)	>5000 ppm	>5000 ppm
Avian dietary (bobwhite)	>5000 ppm	>5000 ppm
Freshwater fish (rainbow)	1.8 ppm	1.8 ppm
Freshwater Invertebrate (daphnid)	2.2 ppm	1.8 ppm

#### 101.5. ADEQUACY OF LABELING

The following statement should be added to the Environmental Precautionary labeling section: "Do not apply directly to water or wetlands."

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102 CLASSIFICATION NA

103 CONCLUSIONS

Based on evaluation of the toxicity data, the estimated exposure, the specificity that pheromones exhibit, and the low application rate, EEB expects that there will be no unacceptable adverse effects on fish, wildlife, or insects arising from the registration of Stirrup-M as an attractant for mites.

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