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SHAUGHNESSEY NO.

16  
REVIEW NO.

EEB BRANCH REVIEW

DATE: IN 1/10/84 OUT 4/18/84

FILE OR REG. NO. 279-GNET

PETITION OR EXP. PERMIT NO.

DATE OF SUBMISSION 12-20-83

DATE RECEIVED BY HED 1-6-84

RD REQUESTED COMPLETION DATE 4-26-84

EEB ESTIMATED COMPLETION DATE 4-19-84

RD ACTION CODE/TYPE OF REVIEW 121/New Chemical

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

DATA ACCESSION NO(S).

PRODUCT MANAGER NO. T. Gardner (17)

PRODUCT NAME(S) Ammo 2.5 EC

COMPANY NAME FMC Corporation

SUBMISSION PURPOSE Proposed registration of cabbage use

SHAUGHNESSEY NO. CHEMICAL, FORMULATION 8 A.I.

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100. Pesticide Name: Cypermethrin 2.5 EC

100.1 Submission Purpose and Pesticide Use

Full registration for cabbage use

100.2 Formulation Information

Cypermethrin	30.6%
Inert Ingredients	69.4%

Contains 2.5 pounds cypermethrin per gallon.

100.3 Application Methods, Directions, Rates

Crop	Pest	Dosage	
		Lb ai/a	Fl oz/a
Cabbage	Beet Armyworm Diamondback Moth Larvae  Imported Cabbage worm Cabbage Looper Cabbage Aphid	0.05 - 0.1	2.5 - 5

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Remarks

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Apply Ammo 2.5 EC as necessary for insect control using a minimum of 15 gallons of finished spray per acre with ground equipment and 1 gallon per acre by air.

Do not make more than 10 applications per season. Ammo may be applied within 1 day of harvest.

## 100.5 Precautionary Labeling

## Environmental Hazards

This product is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds while bees are actively visiting the treatment area.

This product is extremely toxic to fish. Use with care when applying in areas adjacent to any body of water. Do not apply directly to water. Do not apply when weather conditions favor drift from treated areas. Do not contaminate water by cleaning of equipment, or disposal of wastes.

## 101. Hazard Assessment

The following states grow cabbage:

Acres<sup>1</sup>

State	Winter	Spring	Summer	Fall	Total
- California	2,600	2,200	2,000	2,300	9,100
- Colorado			1,400	-	1,400
- Florida	9,700	5,000		1,700	16,400
- Georgia		1,700	1,000		2,700
- Hawaii					460
- Illinois			1,300		1,300
- Indiana			1,200	100	1,300
- Maryland			720		720
- Massachusetts			720		720
- Michigan			2,000	1,000	3,000
- New Jersey		700	2,100	1,000	3,800
- New York L.I.			700	600	1,300
- New York State			1,500	5,900	7,400
- North Carolina		2,000	2,600	1,900	6,500
- Ohio		350	1,200	400	1,950
- Oregon				600	600
- Pennsylvania			1,900	1,000	2,900
- South Carolina		700			700
- Tennessee		750			750
- Texas	9,500	4,000		4,100	17,600
- Virginia			1,300	430	1,750
- Washington			850		850
- Wisconsin			900	700	1,600
	17,400	18,350	22,640	23,980	84,780

The main cabbage production is in California, Florida, Texas, New York, and North Carolina. They account for 69% of the cabbage grown.

Cabbage is a speciality crop and is sold mainly as a raw vegetable. Since consumer response will depend upon eye appeal, more attention will be spent in preventing insect damage. This is reflected in the label recommendation of a maximum of 10 applications per season. It is reasonable to assume that some of the applications will be prophylactic in nature since the last application can be applied within one day of harvest.

In terms of crop production, cabbage can be considered a minor crop in normal circumstances. However, four of the major cabbage producing states California, Florida, Texas and North Carolina produce crops three times a year (see production table). Most of the other producing areas have two crops per season. This translates into heavy pesticide use on a year around basis. Also, the total amount of acres should not be underestimated. In other major crops, as corn, soybeans etc., only one crop per growing season is possible. This is not the case with cabbage because of a multiple crop season. The total amount of acreage is technically expanded approximately greater than two times. While still a minor use compared to major crops, the amount of acreage cannot be disregarded when consideration is given to the insecticide used.

The main concern is with the aquatic hazard. From an environmental fate study of a cotton field treated with label rates and 16 applications, cypermethrin was found eight miles downstream in the Alabama River. The chemical underwent tertiary dilution by the time it reached the river sampling site. The cabbage dosage rate is similar to cotton, 0.1 lb ai/A, and the number of applications is 10 versus 15. It is presumed that the two crops are similar enough that some cypermethrin will reach the aquatic environment. Cabbage will probably have a greater aquatic impact because it is multiple crop per year product where viable resources will be subjected to a chronic runoff problem.

The question is whether cabbage is grown in areas where any aquatic impact is possible. Simply put-yes. The following table list the primary cabbage producing states and their key counties that have over 1,000 acres of cabbage. Across from the counties are the possible aquatic impact sites.

State/Counties	Aquatic Site
California	
Monterey	Pacific estuaries
Santa Barbara	Pacific estuaries
Ventura	Pacific estuaries
Florida	
Flager	St. Johns River
Palm Beach	Atlantic Coast
Putnan	St. Johns River
St Johns	St. Johns River/Atlantic Coast
Seminole	St. Johns River
Volusia	St. Johns River/Lake George

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New York	
Genessee	
Monroe	Lake Onterio
Magra	Lake Onterio/Lake Erie
Onterio	Finger Lakes
Orleans	Lake Onterio
Sufflock	Atlantic Coast/Long Island Sound
Yates	Finger Lakes
North Carolina	
Pasquotank	Albemarle Sound Estuary
Texas	
Cameron	Rio Grand/Gulf Mexico
Hidalgo	Rio Grand

Most of the major cabbage producing sites are on estuaries or grown near major rivers that empty into an estuarine environment. Florida is the best example. Lake George is the head water of the St. Johns River which empties into the Atlantic Ocean.

The registrant suggests that the aquatic impact would be limited to an initial slug of pesticide which the animal could endure because of the short duration of exposure. The cabbage planting schedule would preclude this to a large degree. Cabbage is a 60 to 90 day crop from seed to harvest. Because the seed is very small cabbage sprouts will be used. This would shorten the application times by approximately two weeks. Assuming a 76 day in field growing season, a maximum of 10 applications would be applied on a weekly basis over ten weeks. If runoff occurs on a similar schedule the aquatic organisms would experience approximately 10 "slug" periods with chronic exposure between application dates. This is realistic if irrigation is used. With this scenario, the sensitive aquatic species would be under threat. With multiple crops per year, recovery would be very slow, if at all.

### 101.3 Endangered Species Considerations

None can be made at this time because an aquatic impact assessment cannot be made at this time.

### 101.4 Adequacy of Toxicity Data

The six basic studies have been completed. An aquatic field study is necessary to complete an aquatic assessment.

### 103 Conclusions

EEB has completed a full risk assessment (3(c)(5) finding) of the proposed conditional registration of cypermethrin for use on cabbage. Based upon the available data EEB concludes that the proposed use provides for a significant increase in exposure with acute and chronic risks to non-target organisms.

EEB wants to emphasize, however, that the above conclusion is based upon data that cannot fully address the aquatic problem. If a more accurate risk assessment of cypermethrin is required, then pertinent aquatic benthic field use data should be submitted.

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