SHAUGHNESSEY NO. _____ REVIEW NO. _____

EEB REVIEW OCT 25 1985

DATE: IN 8-6-85 OUT _____

FILE OR REG. NO 201-401

PETITION OR EXP. NO. _____

DATE OF SUBMISSION 6-19-85

DATE RECEIVED BY HED 8-2-85

RD REQUESTED COMPLETION DATE 10-9-85

EEB ESTIMATED COMPLETION DATE 10-2-85

RD ACTION CODE/TYPE OF REVIEW 330/New Use-IR-4

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

DATA ACCESSION NO(S). N/A

PRODUCT MANAGER NO. 15-LaRocca-Heyward

PRODUCT NAME(S) Pydrin 2.4 EC (Fenvalirate)

COMPANY NAME Shell Chemical Corporation

SUBMISSION PURPOSE Proposed use on collards

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

100.0 Pesticide: Pydrin 2.4 EC

101.0 Submission Purpose: IR-4 Amendment/New Use on Collards.

102.0 Application Rate: Pydrin is to be applied at a rate of 0.1-0.2 lb ai/A by ground or aircraft. Repeat as necessary to maintain control. Do not feed livestock on treated plant parts. Do not exceed 0.8 lbs ai/A per season.

103.0 Pysical and Chemical Properties: Refer to Data Profile.

104.0 Toxicological Properties: Refer to Data Profile.

105.0 Hazard Assessment:

Pydrin 2.4 EC is currently conditionally registered on cotton, field corn, peanuts, soybeans, apples, peaches, pecans, filburts, cabbage, cauliflower, cucumbers, melons, pumpkins, beans, potatoes, and sweet corn. Shell Oil Co., is proposing a new use for collard, a crop that accounts for about 9,800 acres, nation - wide.

Pydrin, a second generation pyrethroid, is relatively persistent and extremely toxic to aquatic organisms. Under anaerobic conditions, Pydrin degradation proceeds at a slow rate with a half-life of about 6 months. Although, hydrolysis results after 24 days at pH 7.2, pydrin is strongly sorbed from aqueous solutions onto soil (soil/water partition coefficient was found to be greater than 15,000 and desorption is slowly reversible).

Pydrin appears to be practically non-toxic to birds (mallard LD_{50} = 9932 ppm; Bobwhite quail LC_{50} = 10,000 ppm). However, Pydrin is highly toxic to fish (Bluegill LC_{50} = .42 -0.64 ppb), and aquatic invertebrates (Daphnia magna EC_{50} = 1.6 ppb). Dr. Richard Garnas at the (EPA) Gulf Breeze station, stated that because of Pydrin's tendency to bind to organic sediment, there could be a threat to detritus feeding aquatic organisms.

Field studies (Faatz:5-83, 9-80) indicate that Pydrin residues via runoff, can be detected in an aquatic system at levels that equal or exceed aquatic LC_{50} values. The studies, also, note that these residues are detectable one year after initial application. This potential for exposure and high toxicity, suggests that Pydrin use may impact aquatic ecosystems adjacent to agricultural land where the pesticide is being used.

The toxicity of Pydrin to aquatic organisms is of predominant concern. A significant hazard to fish and aquatic invertebrates can occur through exposure of Pydrin via runoff and/or drift. Although application rates appear low (i.e., 0.03-0.6 lb ai/A), the effects of runoff, repeat application and persistence may impact non-target organisms in aquatic areas adjacent to sprayed fields. Estimations of the enviromental concentration after one application can be calculated as follows:

1. Assume 1% runoff from field;
2. Assume 40% acure drainage with 8 acre runoff into a pond; and
3. Assume a maximum application of .06 lb ai/A.

Therefore: .06 lb ai/A X .01 = .0006 lbs ai/A loading unit.
.0006 X 8 = .0048 lb ai/A reaches the water.

Estimated environmental concentrations at three water depths are as follows:

6" = 3.67 ppb
3' = 0.61 ppb
6' = 0.31 ppb

Comparing the estimated environmental concentrations (EEC) with effect levels for fathead minnow fry, a potential for chronic hazard is evident. The EEC's exceed the effect level for fry survival and egg production of 0.9 and 0.21 ppb, respectively. Acute toxicity to fish is expected, since, the EEC's exceed the bluegill LC_{50} of 0.42 ppb. These values, suggest that one application of Pydrin can significantly impact an exposed aquatic ecosystem and that multiple applications combined with persistence, can cause a greater threat.

105.1 Endangered Species:

The Ecological Effects Branch has evaluated the geographic distribution of endangered species with that of collards. An informal consultation (phone conversation) was initiated whenever crops and endangered species were found to occur in the same county. In the case of collards, no endangered species are expected to be impacted from the use of Pydrin.

105.2 Data Requirement:

The following data requirements are still outstanding:
An aquatic invertebrate life cycle study (§72-4).
An acceptable aquatic field study (§72-7).

3

107.0 Conclusion:

EEB has completed it's evaluation of this IR-4 amendment for Pydrin 2.4 EC use on collards. Although this low acreage crop does not appear to present an incremental increase in risk to non-target organism, the registered uses of Pydrin meet Speical Review criteria (proposed 154.7).

The available data indicate that acute and chronic hazards to aquatic organisms are a very possible outcome from the use of Pydrin. These results and concerns reflect the need for a higher tier study (i.e., aquatic field testing) before EEB can complete a hazard assessment on this chemical.

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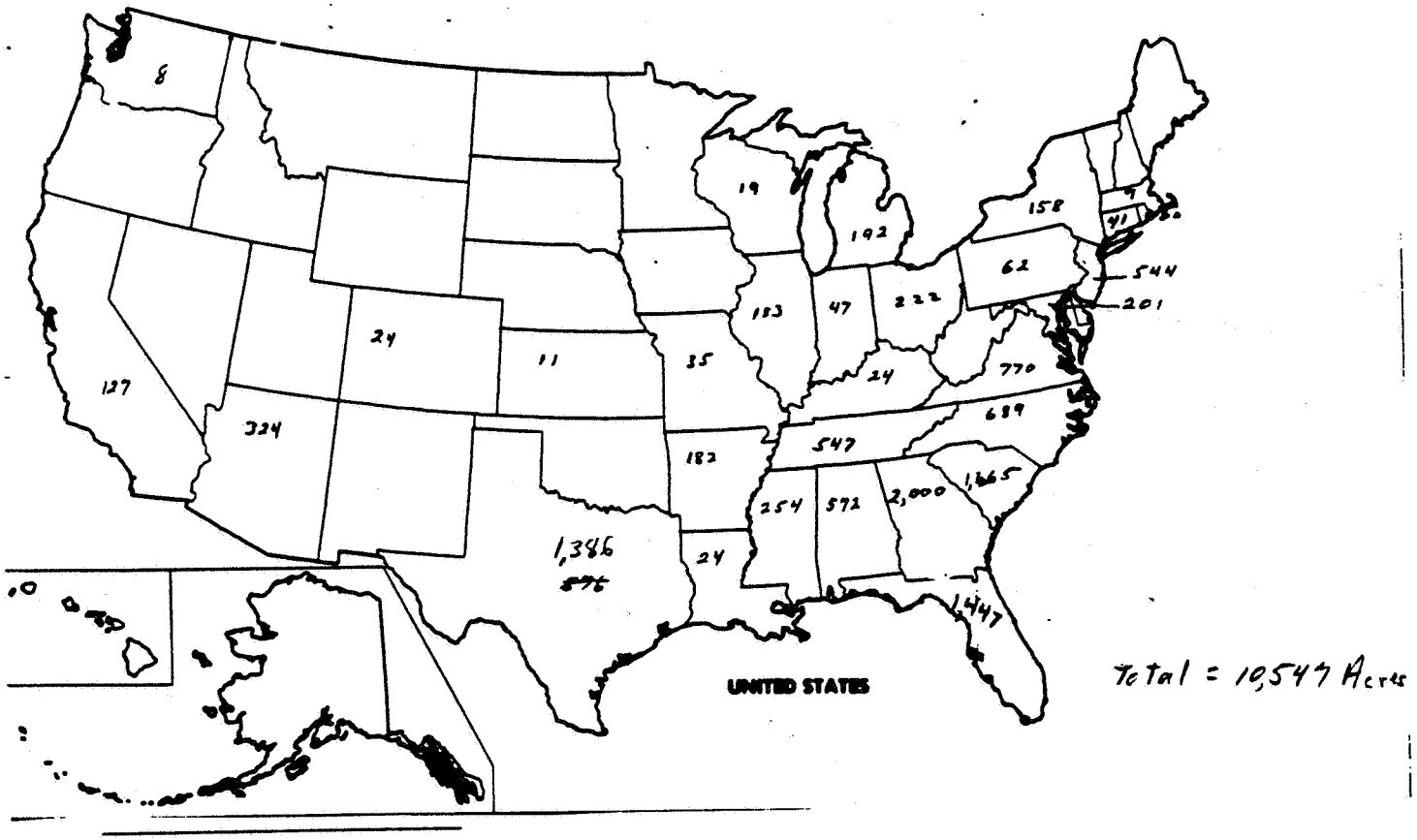
4

FIGURE 1. Collards Acreage in the United States [1]



1/ 1974 Census of Agruculture, U.S. Department of Commerce, Bureau of the Census