UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 1 1988

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: PP#8E3596. Fenvalerate (Pydrin) on Okra. Evaluation of Analytical Methods and Residue Data.
MIRD No. 404466-00, -01. RCB No. 3195.

FROM: Martha J. Bradley, Chemist MJBradley
Residue Chemistry Branch
Hazard Evaluation Division (TS-769C)

TO: Hoyt L. Jamerson, Minor Use Officer, PM 43
Process Coordination Branch
Registration Division (TS-767C)

and

Toxicology Branch
Hazard Evaluation Division (TS-769C)

THRU: Robert S. Quick, Section Head
Tolerance Petition Section 1
Residue Chemistry Branch
Hazard Evaluation Division (TS-769C)

Interregional Research Project No. 4 National Coordinator J.J. Baron and National Director Dr. R. H. Kupelian, on behalf of the IR-4 Technical Committee and the Agricultural Experiment Station of North Carolina, request the establishment of a tolerance for the residues of the insecticide fenvalerate, cyano (3-phenoxyphenyl)methyl-4-chloro-alpha-(1-methylethyl)benzeneacetate in or on the raw agricultural commodity okra at 2 ppm. This use is for a regional registration limited to Florida and North Carolina. The tolerance is to supplant a 0.1 ppm tolerance of fenvalerate on okra with a regional registration in Florida only. Additional residue data generated for fenvalerate on okra has shown that the 0.1 ppm tolerance was not high enough.

Fenvalerate tolerances are established for a variety of agricultural commodities ranging from 0.02 ppm on corn grain, peanuts and potatoes to 50 ppm on corn fodder and forage, 40 CFR 180.379, 21 CFR 193.86 and 561.97. Numerous tolerances are pending at levels ranging from 0.01 to 100 ppm.

E. I. Du Pont de Nemours and Company submitted a letter to the Agency authorizing the use of Du Pont Company data for fenvalerate in support of the subject petition.

Conclusions

1. For the purpose of this petition, RCB concludes that the nature of the residue is adequately understood. The residue to be regulated is the parent compound.

2. RCB concludes that adequate analytical methodology is available to enforce the proposed tolerance.

3. Because of the great difference in residues from the two similar studies, requiring a 20 fold increase in the tolerance, RCB feels that the data are inadequate to extend the regional registration to North Carolina and to establish the proposed tolerance of 2 ppm.

Additional residue studies are needed at the maximum application rate. Samples should be taken at various intervals during the study reflecting 1 day PHIs after the last treatment, not necessarily after the maximum number of treatments allowed. Care should also be taken so that control plants do not become contaminated. The studies should be conducted in the states where use is intended, presumably Florida and North Carolina.

4. Okra is not considered to be a livestock feed item, therefore, RCB does not expect a residue problem in meat, milk, poultry or eggs.

5. The International Residue Limit Status sheet is attached. There are no Codex, Canadian or Mexican tolerances or limits for fenvalerate on okra.

Recommendation

RCB recommends against the proposed tolerance of 2 ppm on okra because of Conclusion 3. For further consideration, additional data are needed as specified in Conclusion 3.

Detailed Considerations

Manufacture and Formulation

The manufacturing process for fenvalerate was submitted with PP#0F2013 and reviewed with that petition (memo of E. L. Gunderson, 04/21/78). The technical product is ca 92% pure fenvalerate. RCB expects no residue problems from the technical impurities.

Technical fenvalerate is formulated as Pydrin Insecticide 2.4 Emulsible Concentrate (EPA Reg. No. 201-401) which contains 2.4 lb ai/gallon. The inerts are all cleared under 40 CFR 180.1001 for food use.

Proposed Use

For control of stinkbugs and corn earworm on okra, fenvalerate is to be applied at 0.1 to 0.2 lb ai in 30 to 100 gallons of spray per acre by ground equipment. Applications may be made at 7 day intervals up to a maximum of 2 lb ai/A/season. The last application may be no later than 1 day before harvest. This use is limited to Florida and North Carolina.

Nature of the Residue

No new plant metabolism studies were submitted in this petition. Radiolabeled metabolism studies have been conducted on cotton, apple, lettuce, tomatoes and soybeans.

The above studies indicate that fenvalerate does not readily translocate and that degradation is slow. The predominant residue is the parent compound. A photodegradate, 4-chloro-beta-(1-methylethyl)-alpha-(3-phenoxyphenyl)benzenepropanenitrile, has been found at various levels in various crops. TOX has concluded that residues of the photodegradate, from current uses, are not significant and should not be included in the fenvalerate tolerance expression (Alvin Kocialski, 07/19/84).

For the purpose of this petition, RCB concludes that the nature of the residue is adequately understood. The residue to be regulated is the parent compound.

Analytical Methodology

The methodology used for residue data on okra was "Protocol for Fenvalerate Analysis in Okra". Chopped okra was extracted with two 200 ml portions of hexane. The extracts were filtered through phase separating paper and sodium sulfate. The filtrate was concentrated and injected into a gas chromatograph with an electron capture detector. Recoveries at 0.02, 0.1 and 0.5 ppm fortification levels were 88 - 100%. Control values were <0.02 to 0.09 ppm with one apparent control at 0.15 ppm. It appears that some of the control samples were contaminated. In the previous petition, PP#5E3282 fenvalerate on okra, all controls were <0.02 ppm.

A successful method validation trial was conducted on Shell Development Co method in conjunction with PP#7F2013 on

cottonseed, meat and milk and is published in the Pesticide Analytical Manual Volume II as Method I.

RCB concludes that adequate analytical methodology is available to enforce the proposed tolerance.

Residue Data

Storage Stability of Residues

Frozen storage stability studies have previously been submitted and discussed by M. Kovacs in PP4E2974, 3/19/84. Residues of fenvalerate in cottonseed, stored for 99 weeks; apples, alfalfa and sorghum, stored for 21 months showed no apparent loss of fenvalerate residues during storage. Chopped collards, fortified at 0.1 and 5 ppm and stored for 2 weeks to eight and one half months, had recoveries between 60 and 103% with an average of 79%.

In the current petition, treated and harvested okra samples were stored for 6 months before analysis. Currently submitted storage studies of chopped and fortified okra samples stored for 2 months indicated only 51 to 72 % recovery. Because of the demonstrated storage stability of fenvalerate on various rac's coupled with the relatively short storage interval of fenvalerate treated okra samples in the current petition, we are raising no questions with regard to the stability of fenvalerate in the okra samples analyzed.

Residue Studies

One residue study was conducted in North Carolina. Fenvalerate was applied to okra at about two months after planting at 0.2 and 0.4 lb ai/A (1 and 2X). Applications were repeated at weekly intervals for a total of 10 applications. Okra pods were discarded until samples were taken one day after the tenth application. Some plants were past production and no pods were available. Residues from the 1X treatment ranged from 1.32 to 1.75 ppm while residues from the 2X treatment ranged from 1.65 to 3.5 ppm.

An earlier fenvalerate residue study was conducted in Florida (PP5E3282, M. Kovacs, 8/30/85) in which okra pods were sampled 1, 3, and 5 days after 9 applications at 1 and 2X. Residues ranged from <0.02 to 0.04 ppm from the 1X treatment with 1 day PHI and 0.03 to 0.07 ppm from the 2X treatment with 1 day PHI. This study resulted in a 0.1 ppm tolerance with a regional registration in Florida only.

Okra plants reach maturity and harvesting may begin 50-60 days from planting. The pods are harvested about 4 to 6 days

after flowering and harvesting is recommended every other day or three times a week as overly mature pods are not desirable. It is unlikely that the additional application in the North Carolina study could account for the higher residues found since fenvalerate is not readily translocated and the pods, normally, would be subject to only one treatment.

Because of the great difference in residues from the two similar studies, requiring a 20 fold increase in the tolerance, RCB feels that the data are inadequate to extend the regional registration to North Carolina and to establish the proposed tolerance of 2 ppm.

Additional residue studies are needed at the maximum application rate. Samples should be taken at various intervals during the study reflecting 1 day PHIs after the last treatment, not necessarily after the maximum number of treatments allowed. Care should also be taken so that control plants do not become contaminated. Data should be submitted from the states where use is intended, presumably Florida and North Carolina.

Meat, Milk, Poultry and Eggs

Okra is not considered to be a livestock feed item, therefore, RCB does not expect a residue problem in meat, milk, poultry or eggs.

Attachment: International Residue Limit Status sheet

cc with Attachment: M. Bradley, RF, Circu, PP8E3596, PMSD/ISB
TS-769:RCB:M Bradley:mb:CM#2:Rm810:557-7324:03/30/88
RDI:RSQuick:03/31/88:RDSchmitt:03/31/88

attachment 1

INTERNATIONAL RESIDUE LIMIT STATUS

CHEMICAL Fenvalerate (Pydrin®)

CODEX NO. 17

CODEX STATUS:

☑ No Codex Proposal Step 6 or above

Residue(if Step 8): _____

Crop(s)	Limit (mg/kg)

PROPOSED U.S. TOLERANCES:

Petition No. 8E3596

RCB Rewiewer MJB

Residue: parent

Crop(s)	Limit (mg/kg)
okra	2 ppm

CANADIAN LIMITS:

☑ No Canadian limit

Residue: _____

Crop(s)	Limit (mg/kg)

MEXICAN LIMITS:

☑ No Mexican limit

Residue: _____

Crop(s)	Limit (mg/kg)

NOTES:

Form revised 1986