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

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HEALTH EFFECTS DIVISION
SCIENTIFIC DATA REVIEWS
EPA SERIES 361

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: **Section 18: ID# 96TX0009.** Emergency Exemption for Use of Pirate on Cotton in Texas to Control the Beet Armyworm

Tox. Chem. No.:	None
PC No.:	129093
Barcode No.:	D222258
Submission No.:	S498778

TO: Meredith Johnson, Manager, PM Team 41
Margarita Collantes, Reviewer, PM Team 41
Emergency Response and Minor Use Section/Registration Support Branch
Registration Division (7505W)

FROM: William Dykstra, Ph.D. William Dykstra 2/7/96
Review Section I, Toxicology Branch I
Health Effects Division (7509C)

THRU: Guruva Reddy, D.V.M., Ph.D. 2/7/96
Review Section IV, Toxicology Branch I
Health Effects Division (7509C)
and
Roger Gardner, Section Head, Toxicologist KB 2/7/96
Review Section I, Toxicology Branch I
Health Effects Division (7509C) Roger Gardner 2/7/96

I. CONCLUSIONS

Although the toxicology data requirements are not complete, there are sufficient toxicology studies available to support the Section 18. **Toxicology Branch I has no objection to the reissuance of this Section 18 exemption.**

Several additional toxicology studies with pirate were evaluated by the contractor and examined by Dr. Reddy for this Section 18 on 1.8 million acres of cotton in Texas. These studies include 2-generation rat reproduction study, rat and mouse chronic toxicity/carcinogenicity studies, acute neurotoxicity study, chronic dog study, 21 day dermal toxicity in rabbits, and a one-year neurotoxicity study in rats. **Dr. Reddy determined that significant neurological effects were present in a one-year neurotoxicity study in rats with an LEL of 60 ppm (3.0 mg/kg/d) and**

no NOEL established. This LEL of 3.0 mg/kg/d is the lowest LEL or NOEL for neurotoxicity in any of the examined studies. This LEL in the one year neurotoxicity study has been used to temporarily establish the RfD for pirate.

There are no toxicology concerns for acute dietary exposure.

The previous toxicology studies available on the effects of pirate included a 90 day dog feeding study with a NOEL of 4.23 mg/kg/day (120 ppm), a 90 day rat feeding study with a NOEL of 15 mg/kg/day (300 ppm), a rat developmental study with a maternal NOEL of 25 mg/kg/day and a developmental NOEL of 225 mg/kg/day (HDT), and a rabbit developmental study with a maternal NOEL of 5 mg/kg/day and a developmental NOEL of 30 mg/kg/day (HDT). There also are two negative acceptable mutagenicity studies and a full battery of acute studies on the technical and formulated product.

The short term margins of exposure (MOEs) for farm workers are substantially greater than 100 for the use on cotton by ground/aerial equipment when worker exposure is compared to the 21 day rabbit dermal NOEL of 1000 mg/kg/day.

II. ACTION REQUESTED

In a letter dated January 8, 1996, the Texas Department of Agriculture requested an emergency exemption under Section 18 for the use of pirate insecticide to control beet armyworms Spodoptera exigua on 1,800,000 acres of cotton. This is the second request made by Texas for this use. According to the applicant, the cotton insecticides available are only slightly effective in controlling beet armyworm.

Pirate 3SC (American Cyanamid) is the formulation for the active ingredient. The pesticide will be used for a total of two applications using commercial ground or aerial equipment per growing season. The rate of application will be 0.2 lbs ai/A (8.53 fl.oz. of the 3SC formulation per acre). The preharvest interval was not specified, but is expected to be the same as in 241-EUP-126.

III. TOXICOLOGY BRANCH I COMMENTS

The toxicology data base for pirate is sufficient to support the proposed Section 18 exemption.

IV. RISK/EXPOSURE ASSESSMENT

This action was submitted to OREB (Occupational and Residential Exposure Branch) for determination of exposure estimates (see attached memo from George Tompkins to W. Dykstra, dated February 5, 1996). Therefore, the OREB exposure estimates, unadjusted for dermal penetration, and the 21 day rabbit dermal toxicity NOEL of 1000 mg/kg/d were used to determine the short term MOEs. The previous Section 18 for cotton used the maternal NOEL of 5.0 mg/kg/d to determine short term MOEs.

Formula used in calculations:

Short Term MOE = NOEL (1000 mg/kg BW/d) ÷ Exposure (mg/kg BW/d)

OPERATION*	EXPOSURE* (mg/kg/d)	SHORT TERM MOE
Mixer/Loaders, ground boom	0.021	47,619
Applicator, ground boom	0.007	142,857

OPERATION*	EXPOSURE* (mg/kg/d)	SHORT TERM MOE
Mixer/Loaders, aerial	0.067	14,925
Applicator, aerial	0.0081	123,456

Minimum clothing requirements for Applicators are long pants, long-sleeved shirt, and gloves; Mixer/Loader exposure is based on wearing long pants, long sleeves, and gloves (Worker Protection Standard for Agricultural Pesticides).

V. SPECIAL TOXICOLOGY ISSUES AND PROBLEMS

1. Labelling. The labelling precautionary statements for Pirate 3SC are governed by toxicity studies on the formulated product. The label signal word is Warning due to acute oral and dermal toxicity studies. Acute inhalation and Primary eye are Toxicity Category III and Primary skin is Toxicity Category IV. Pirate 3SC is not a dermal sensitizer.

2. Carcinogenicity. Dr. Reddy has preliminarily reviewed the contractors DERs for carcinogenicity in rats and mice and has indicated that no carcinogenicity problems have been identified.

3. RfD. The RfD/Quality Assurance Peer Review Committee has not met to assess the reference dose for this chemical. **Based on the LEL of 60 ppm (3.0 mg/kg/d) for neurological lesions in the one-year rat neurotoxicity study, an RfD of 0.01 mg/kg/day is being temporarily recommended.** A NOEL for these

brain lesion was not established in the one-year study. An uncertainty factor of 300 was used to account for the use of an LEL and the incomplete data base for pirate.

A brief summary of the study for the RfD is presented below:

Randomized groups of 25/sex/dose Sprague-Dawley rats were fed dietary levels of 0, 60, 300, or 600 ppm of pirate technical for 52 weeks, followed by a 16 week recovery period during which the remaining rats were fed control diet. Rats were evaluated for FOB and motor activity at weeks -1, 4, 8, 13, 26, 39, and 52; and 13 weeks after cessation of treatment.

At 600 ppm, males showed decreased weight gain, food consumption, and had myelin sheath swelling in the spinal nerve roots (5/5 males at 600 ppm vs 2/5 in controls). At 52 weeks, similar neurological damage plus myelin or axon degeneration was found at 600 ppm, 300 ppm and 60 ppm with a dose related incidence in treated males. Females were only affected at 600 ppm and were not similarly affected as males with respect to neurological damage at 300, and 60 ppm.. Clinical signs and FOB and motor activity in affected males and females were not significantly altered by treatment.

The previously used RfD was 0.004 mg/kg/d, based on the NOEL in the 90 day dog feeding study.

4. Other Biological Effects. In other studies preliminarily reviewed by Dr. Reddy, the one year dog study and 2-generation rat reproduction studies are acceptable and without significant concerns.

In a rabbit teratology study, pregnant NZW rabbits were gavaged from days 7-19 of gestation at doses of 0, 5, 15 or 30 mg/kg/day. The maternal NOEL was 5.0 mg/kg/day and the LEL was 15 mg/kg/day with the effects being decreased body weight gain during treatment. The developmental NOEL was 30 mg/kg/day (HDT).

In a rat teratology study, the doses are 0, 25, 75, or 225 mg/kg/day during gestation days 6-15 by gavage in Sprague-Dawley rats. The maternal NOEL is 25 and the LEL was 75 mg/kg/day with the effects being reduced weight gain, reduced relative food and water intake. The developmental NOEL is 225 mg/kg/day (HDT).

5. Mutagenicity/genetic toxicity comments. In studies conducted for the Agency, pirate at concentrations up to 50 ug/plate (cytotoxic level) was not mutagenic in Salmonella typhimurium strains TA100, TA1535, TA1537, and TA98, with and without metabolic activation. , Pirate was also negative for inducing

unscheduled DNA synthesis up to 30 ug/ml (severely cytotoxic) in primary rat hepatocyte cultures.

6. Dermal Penetration. There are no available dermal penetration data for pirate. However, little dermal penetration is expected since, a preliminary evaluation of a 21 day dermal toxicity study in rabbits has a systemic NOEL of 1000 mg/kg/d.

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OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM:

SUBJECT: Texas Section 18 Request (96TX0009) to Use Pirate 3SC on Cotton to Control the Beet Armyworm

FROM: George Tompkins, Ph.D, Entomologist
Special Review and Registration Section II

TO: William Dykstra, Ph.D., Toxicologist
Toxicology Branch I
Health Effects Division (7509C)

THRU: Mark Dow, Ph.D., Section Head
Special Review and Registration Section II

Larry C. Dorsey, Chief
Occupational and Residential Exposure Brabch
Health Effects Division (7509C)

The Occupational and Residential Exposure Branch (OREB) has been requested to determine if there is any new data regarding worker exposure concerns from the use of Pirate 3SC to control the beet armyworm on cotton in Texas. This use was reviewed last year (95AL0006, DP Barcode: D217961) and the assessment provided in that document is sufficient to support this use. No new data has been received to change the assessment.

DP Baracode: D222259

Pesticide Chemical Code: 129093

EPA Reg. No.: 241-GAT

CC: G. Tompkins
Correspondence File
Chemical File (129093)