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OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Thidiazuron and Diuron on Cottonseed. EPA Reg. No. 45639-RAR. DP Barcode D189453. CBTS No. 11638. MRID 42668311, 42668312.

FROM: R. W. Cook, Chemist. *RWCook*
Tolerance Petition Section I
CBTS/HED (7509C)

THRU: Debra Edwards, Ph.D., Chief *Debra Edwards*
CBTS/HED (7505C) *10/7/93*

TO: J. Miller, PM 23
Fungicide-Herbicide Branch
Registration Division (7505C)

Deficiencies Outstanding

None.

Conclusions:

1. Tolerances are currently established on cottonseed for both the active ingredients, thidiazuron and diuron.
2. Residues of thidiazuron and diuron in ginned cottonseed resulting from the application of GINSTAR EC™ at rates of 0.15 lbs. a.i./A. thidiazuron + 0.07 lbs. a.i./A. diuron [total of both active ingredients 0.225 lbs. a.i./A.] at 5 days preharvest do not exceed the established tolerances: thidiazuron of 0.4 ppm and diuron at 1 ppm.
3. Since residues of thidiazuron and diuron from the combined application as GINSTAR EC™ do not exceed the established



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contains at least 50% recycled fiber

tolerances, the established tolerances for these residues in meat, milk, poultry and eggs are not likely to be exceeded.

4. The storage stability data gap identified in the registration standard will be resolved at the time of reregistration.

Recommendations

We recommend for the proposed registration.

Background

Tolerances for residues of thidiazuron and its aniline containing metabolites in or on cottonseed are established in 40 CFR 180.403 at 0.4 ppm, based upon the review by D. Duffy, 10/13/76, PP6G1807 and A. Smith, 9/8/81 PP1F2527/FAP1H5308. Thidiazuron is currently listed as a list D chemical. Current use pattern for thidiazuron as a cotton defoliant includes application of 0.1 to 0.2 lbs. a.i./A. when 70% of the bolls are open. For rank cotton two applications are permitted per season with a maximum application rate per season of 0.3 lbs. a.i./A. A preconditioning application of 0.005 to 0.025 lbs. a.i./A. is also allowed. A five day preharvest interval is imposed, and gin trash and treated cotton foliage may not be fed to livestock.

Tolerances for residues of diuron from a herbicidal use in or on cottonseed are established in 40 CFR 180.106 at 1 ppm. Diuron is a list A chemical.

In addition to residues for diuron from the application of GINSTAR EC™, residues of diuron result from 1, 2 or 3 applications of diuron as different rates at different plant growth stages and at different rates for different states and soil types.

An experimental use permit (EPA Reg. No. 45639-EUP-36) for a formulation mixture of thidiazuron and diuron as a cotton defoliant was favorably reviewed by L. Propst (7/17/87), provided a 5 day preharvest interval is imposed and grazing or feeding of treated cotton foliage to livestock is restricted.

More recently, a Phase Four review of thidiazuron data (F. A. Fort, undated) showed data gaps in the reregistration package for this compound. Specifically, data gaps in the nature of the residue in animals, analytical methods for residues in animals, analytical methods for residues in plants, storage stability data, and magnitude of the residue in meat, milk, poultry and eggs. The phase four review states that the company, Nor-Am is committed to supplying the data to fulfil the data gaps. The phase four review concluded that the analytical method entitled

"Residue determination of SN 49537 in cottonseed and cotton fiber" (MRID 94246029) was inadequate for either residue data collection or enforcement purposes, since the method, based upon conversion of the residue to an aniline derivative, is non-specific and it will detect other aniline containing moieties.

Further, based upon data gaps reviewed by EFGWB, S. R. Funk (7/20/93) has concluded that new confined rotational crop studies will be required before determining the need for field rotational crop data or revised plant back restrictions.

DETAILED CONSIDERATIONS

Directions for Use

The proposed formulation for use is GINSTAR EC™, EPA Reg. No. 45639-RAR, containing 1 lb thidiazuron and 0.5 lbs diuron per gallon. The product is also known as SN 597.

Apply GINSTAR EC™ cotton defoliant only to mature cotton plants when the last boll you expect to harvest is mature. A boll can be described as 'mature' when it is too hard to be dented when squeezed between thumb and fingers, too hard to be sliced with a sharp knife, and/or when the seed coat becomes light brown in color. GINSTAR EC™ may be applied by air or ground equipment. Apply specified dosages in 10-25 gallons of spray per acre with ground equipment or 2-10 gallons per acre by aircraft.

Apply GINSTAR EC™ at least 5 days prior to anticipated harvest. Apply 0.4 pints to 1.0 pints GINSTAR EC™ per acre (0.075 to 0.2 lbs. a.i./A.). At some locations, following the initial GINSTAR EC™ application, it may be necessary to apply a standard defoliant or a second, low rate of GINSTAR EC™.

Do not apply more than 1.0 pints of GINSTAR EC™ per acre per season. Do not apply this product through any type of irrigation system. Do not feed foliage from treated cotton plants or gin trash to livestock.

Analytical Method:

Thidiazuron residues were analyzed by the thidiazuron method published in PAM II, with minor modification in the size of the distillation flask, weight of sample, substitution of hydrobromic acid for hydrochloric acid, and use of a capillary column instead of a packed column.

The detection limits of the PAM method is 0.05 ppm of thidiazuron, while in the hands of the applicant, the limits of detection are reported to be 0.09 ppm of thidiazuron.

Diuron residues were analyzed by a method based upon the PAM II method for diuron. Diuron was refluxed with alkali to form 3,4-dichloroaniline, which was diazotized and quantitated by spectrophotometry. The applicant reports the limit of detection of diuron at 0.1 ppm.

Storage Stability:

Storage stability data have been identified in the registration standard as a data gap. Based on the phase four review statement (F. A. Fort, undated) that Nor-Am, Inc. is committed to supplying the data to fulfil the data gaps, we will defer resolution of this matter to the registration standard.

Magnitude of the Residue

Ground:

Residue trials were conducted in four states: CA (4), FL (1), GA (1), and MS (2) during the 1987 growing season. Applications were made by conventional high clearance or backpack sprayers. Application rate was 0.225 lbs. a.i./A. [total of both active ingredients]; however, due to error, two Mississippi trials (TLS-01 and TLS-02) were treated at about half the recommended rate for SN597 and as such are of marginal utility. In addition, all plots in JFS-01 and JFS-02 (California) were over sprayed with another thidiazuron product, DROPP 50 WP at 0.15 lbs. a.i./A. and thus exceed maximum recommended application rates. Also, in trial FSCA, diuron was applied late season application at 1.2 lbs. a.i./A., exceeding the recommended rate of 0.8 lbs. a.i./A.

Preharvest interval ranged from 6 to 18 days, even though the recommended preharvest interval is 5 days. Cotton was hand picked, frozen, and shipped to NOR-AM field stations in Florida or California for ginning and then refrozen for shipment to NOR-AM laboratory for thidiazuron analyses; diuron analyses were performed by contract laboratory ENVIRO-BIO-TECH, LTD, BERNVILLE, PA.

Results:

One sample (GA, 8 day PHI) contained 0.1 ppm of thidiazuron; all other samples showed residues of thidiazuron were below the limit of detection (0.09 ppm). Detectable residues of diuron were found in four samples at levels of 0.1 to 0.14 ppm; four samples were below the detection limit of 0.10 ppm.

Aerial:

In addition, aerial application (helicopter or fixed wing aircraft) residue trials were conducted in four states: AZ (1), CA (2), LA (1), and TS (1) during the 1988 growing season. Application rate was 0.23 lbs. a.i./A. [total of both active ingredients].

Results:

All five samples of ginned cottonseed showed residues of thidiazuron below 0.1 ppm [range 0.03 to 0.07 ppm] and residues of diuron were 0.05 to 0.18 ppm at 5 day preharvest interval.

Conclusions:

Residues of thidiazuron and diuron in ginned cottonseed resulting from the application of GINSTAR EC™ at rates of 0.15 lbs. a.i./A. thidiazuron + 0.07 lbs. a.i./A. diuron [total of both active ingredients 0.225 lbs. a.i./A.] at 5 days preharvest do not exceed the established tolerance: thidiazuron of 0.4 ppm and diuron at 1 ppm.

Meat, Milk, Poultry and Eggs

Since residues of thidiazuron and diuron from the combined application as GINSTAR EC™ do not exceed the established tolerances, the established tolerances for these residues in meat, milk, poultry and eggs are not likely to be exceeded.

cc: Circ., R.F., R. W. Cook.

7509C:Reviewer:RWCook:rwc:10/6/93:Rm810H:CM2

RDI:SectHead:RSQuick:10/6/93:RALoranger:10/6/93:DEdwards:10/7/93.