

3-7-96

MEMORANDUM

SUBJECT: PP#4E04419. Abamectin (AGRI-MEK 0.15EC miticide/insecticide, EPA Reg. No. 618-98) in or on Hops. Amendment of 6/8/95.
MRID No. 436801-01.
CBTS No. 15854; DP Barcode: D217347.

FROM: William D. Wassell, Chemist
Tolerance Petition Section I
Chemistry Branch I - Tolerance Support
Health Effects Division (7509C)

THROUGH: Michael S. Metzger, Chief
Chemistry Branch I - Tolerance Support
Health Effects Division (7509C)

TO: Hoyt Jamerson, PM-43
Emergency Response and Minor Use Section
Registration Division (7505W)

and

Jane Smith, Acting Section Head
Registration Section
Risk Characterization and Analysis Branch
Health Effects Division (7509C)

Summary/Background:

George M. Markle, Associate Director, Interregional Research Project No. 4 (IR-4), State Agricultural Experiment Station, Rutgers University, New Brunswick, NJ on behalf of the IR-4 Project, the Agricultural Experiment Stations of Idaho, Oregon and Washington, the Idaho, Oregon and Washington Hops Commissions and the Hops Growers of America requests the establishment of tolerances with an expiration date of December 31, 1996, for residues resulting from the use of the

miticide/insecticide abamectin [a mixture of avermectins containing $\geq 80\%$ avermectin B_{1a} (5-O-demethyl avermectin A_{1a}) and $\leq 20\%$ avermectin B_{1b} (5-O-demethyl-25-de (1-methylpropyl)-25-(1-methylethyl) avermectin A_{1a})] in or on hops and cattle fat. The time-limited tolerances are requested in terms of the combined residues of the insecticide avermectin B₁ and its delta-8,9-isomer in or on the raw agricultural commodities hops (dried) and cattle fat at 0.5 ppm and 0.015 ppm, respectively. The time-limited tolerances are requested while IR-4 generates additional residue data to support the use of the product on hops.

The current submission consists of a cover letter (dated: 6/8/95) and a volume of data containing an independent laboratory validation of the proposed enforcement method. CBTS has previously recommended for the establishment of the proposed time-limited tolerances (see our memo of 05/02/95, W.D. Wassell, DP Barcode: D214067). IR-4 had previously agreed to provide the independent laboratory validation of the method as per PR Notice 88-5 in an expeditious manner.

Recommendations:

The recommendations from our previous review of this petition (see our memo of 5/2/95, W.D. Wassell, DP Barcode: D214067) remain unchanged and are restated here: CBTS recommends for the establishment of the proposed time-limited tolerances for residues of abamectin in/on dried hops at 0.5 ppm and cattle fat at 0.015 ppm. The petitioner is advised to refer to our memo of 2/6/95 (W.D. Wassell, PP# 4E4419, DP Barcode: D205257) for the data requirements for the granting of Section 3 registration and the establishment of permanent tolerances in conjunction with this use.

Detailed Considerations:

Deficiency 5d: In our earlier review, (W.D. Wassell, 2/6/95, DP Barcode: D205257), CBTS concluded that the proposed enforcement method is not adequate for enforcement of the proposed tolerances and must be independently validated as per PR Notice 88-5 and validated by the Agency's Analytical Chemistry Laboratory prior to a favorable recommendation from CBTS for the proposed time-limited tolerances. CBTS further concluded adequate methodology was not available for the enforcement of the proposed tolerances for residues of abamectin in/on dried hops.

Petitioner's Response: The petitioner has submitted a study entitled: "Independent Laboratory Confirmation of the Enforcement Method for the Determination of Avermectin B₁ Residues in Dried Hops According to PR Notice 88-5 Guidelines (MRID No. 436801-01). The study was performed by personnel of Analytical Development Corporation (ADC) of Colorado Springs, CO. The proposed

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enforcement method (entitled: "Liquid Chromatographic Method for the Quantification of Total Avermectin B₁ and 8,9-Z-Avermectin B₁ in Dried Hops Using Fluorescence Detection", dated: 6/15/94) was validated for use with dried hops at 0.2, 0.5 and 1.0 ppm. The validation of the method was divided into two parts. The first part involved validation for residues of avermectin B₁ and the second part involved validation for residues of 8,9-Z-avermectin B_{1a}.

ADC reports the method was successfully validated for residues of avermectin B₁ in dried hops on the initial attempt. Recoveries for total avermectin B₁ residues ranged from 72% to 85%. Residue levels of all analytes in the reagent blanks and control samples were below the method limit of detection (<2 ppb). The results of the validation for residues of avermectin B₁ are summarized in Table 1.

Table 1. Recovery of residues of Avermectin B₁ from Dried Hops.

Fortification Level	Percent Recovery		
	Avermectin B _{1a}	Avermectin B _{1b}	Combined Recovery
0.20 ppm	77	73	77
	85	75	85
0.50 ppm	72	70	72
	75	69	75
1.0 ppm	83	75	83
	81	76	81

The validation of the method for residues of 8,9-Z-avermectin B_{1a} required three trials. ADC reports that the recovery levels for the first two trials were unacceptably low. Recoveries for the first trial ranged from 65% to 70% and for the second trial ranged from 49% to 67%. During the first trial, sample extracts were stored for a weekend in hexane in a refrigerator. After contacting personnel at Merck, it was discovered that avermectin residues may not be stable in hexane. It was suspected that the brand of solid phase extraction columns may have caused the low recovery in the second trial, but a definitive reason for the low recoveries was not discovered.

The third trial resulted in recoveries for residues of 8,9-Z-avermectin B_{1a} ranging from 61% to 82% with an average recovery of 75%. Residue levels of all analytes in the reagent blanks and control samples were below the method limit of detection (<2 ppb). Two recoveries of six were below 70%, but problems were noted with both samples. For one of the samples, a portion of the extract was spilled which resulted in a recovery of 66%. For the other low recovery, it was noted that the

layers of the hexane wash seemed to separate much slower than the rest of the samples and a large amount of particulate matter remained in the extract. The recovery for this sample was 61%. The results of the third trial are summarized in Table 2.

Table 2. Recovery of 8,9-Z-Avermectin B_{1a} from Dried Hops.

Fortification Level	Percent Recovery
0.20 ppm	81
	78
0.50 ppm	66
	82
1.0 ppm	82
	61

ADC reported a set of 8 or 9 samples can be completed by one analyst in one day (approximately 8 man-hours). This time includes preparation of the HPLC mobile phase. An additional 2 to 3 man-hours are required for evaluation of the chromatograms. ADC suggests two steps may be critical to ensure acceptable performance of the method. These steps are:

1. The extracts cannot be stored in hexane for any extended period of time. The specification of a stopping point in the method is necessary.
2. Care should be taken not to disturb the solid material at the bottom of the tube when the aliquot of extract is removed from the centrifuge tube. Even though the extract has been centrifuged, the solids can be easily disturbed. Large amounts of particulate matter in the extract could affect the hexane wash or extraction.

ADC also noted that the calculations for determining residue levels in the sample extracts were incorrect. The calculations specified utilizing a final extract volume of 0.5 mL, but the actual final volume of the extract is 2.1 mL. The final volume of 2.1 mL includes the volume of added derivatizing reagents.

CBTS Comments:

CBTS concludes the proposed enforcement method (entitled: "Liquid Chromatographic Method for the Quantification of Total Avermectin B1 and 8,9-Z-Avermectin B1 in Dried Hops Using Fluorescence Detection", dated: 6/15/94) has been adequately validated by an independent laboratory for the

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determination of avermectin residues in dried hops. The registrant should be made aware of ADC's comments concerning the proposed enforcement method. A validation of the method by ACL/BEAD is required and is being requested at this time. Once the method has been successfully validated by the Agency, ADC's comments (i.e. storage of extracts in hexane, specification of a stopping point and the calculations) and any comments by ACL/BEAD will need to be incorporated into the method and a revised method will need to be submitted.

cc: WDWassell, RF, Circ., PP#4E4419.

RDI:RSQuick: 07/26/95; MJNelson: 07/26/95; Mmetzger: 07/26/95.
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Disk: WDW-6, File: FY95WDW.135

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Residue Chemistry Review

Subject: PP#4E04419. Abamectin (AGRI-MEK 0.15EC miticide/insecticide, EPA Reg. No. 618-98) in or on Hops.
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Document

Class:

Product

Chem:

Residue 860.1340 Residue analytical method

Chem:

Biochemicals:

DP Barcode: D217347

MRIDs: 43680101

PC Codes: Actives 122804 Abamectin (ANSI)

Inerts

Commodities: Hops

Administrative #: 4E04419; 000618-00098

Reviewers: William D. Wassell

Review M. Metzger

Approved on: March 7, 1996

Approver:



WP Document: Abamecti.055