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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCESMEMORANDUM

Date: 2/22/05

Subject: Tau-Fluvalinate. RED - Reregistration Eligibility Decision Document. Residue Chemistry Considerations. Case No. 2295.

DP Number: D300204

PC Code: 109302

40 CFR 180. 427

MRID Numbers: None

Chemical Class: Insecticide

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This document was originally prepared under contract by Dynamac Corporation (20440 Century Boulevard, Suite 100; Germantown, MD 20874; submitted 08/31/2004). The document has been reviewed by the HED and revised to reflect current OPP policies.

Executive Summary

Tau-Fluvalinate [cyano-(3-phenoxyphenyl)methyl N-[2-chloro-4-(trifluoromethyl)phenyl]-D-valinate] is a broad-spectrum contact, stomach insecticide currently registered by Wellmark International. Tau-Fluvalinate is sold in the U.S. under the trade names Apistan® and Mavrik®. The 10.25% impregnated materials (Impr) formulation is the only tau-fluvalinate formulation registered for food/feed use. The Impr formulation is registered as insecticide strips for use inside beehives to control a parasitic mite. In addition, a 2 lb/gal emulsifiable concentrate (EC) formulation is registered for use on carrots grown for seed, which has been classified a nonfood use.

The name "fluvalinate" is currently the common name for the racemic mixture of the 4 isomers of cyano-(3-phenoxyphenyl)methyl N-[2-chloro-4-(trifluoromethyl)phenyl]-valinate; "tau-fluvalinate" is the term used for the half resolved mixture (2 of the 4 isomers). Both fluvalinate and tau-fluvalinate are covered under PC Code 109302; however, the chemical name listed in 40 CFR for fluvalinate actually refers to the half resolved mixture. The tolerance expression should be revised to reflect the correct common name and the CAS name as follows: "Tolerances are established for residues of the insecticide tau-fluvalinate [cyano-(3-phenoxyphenyl)methyl N-[2-chloro-4-(trifluoromethyl)phenyl]-D-valinate]".

In discussing the residue data, the tau-fluvalinate name was used when it could be determine that the data were actually for the half resolved mixture; otherwise, the name fluvalinate was used.

The nature of the residue in honey is adequately understood. Currently tolerances are expressed in terms of tau-fluvalinate *per se*. The current tolerance expression is adequate. A single tolerance is established under 40 CFR §180.427(a) for residues of tau-fluvalinate [referred to as fluvalinate], in/on honey at 0.05 ppm. Adequate data are available to reassess the established tolerance for honey at the same level. However, based on the available data, the established tolerance may be reduced from 0.05 ppm to 0.02 ppm.

A GC/ECD method is available for the enforcement of tolerances for residues of tau-fluvalinate in honey; this method has been forwarded to FDA for publication in PAM Vol. II. This method has a limit of detection of 0.01 ppm.

The Chemistry Branch completed the Fluvalinate Phase 4 Review on 1/16/91. A Fluvalinate Data-Call-In (DCI) Notice was subsequently issued 4/12/91. At the time the Fluvalinate Phase 4 Review was issued, the registrant had stated that the use on cotton, the only registered food/feed crop use at that time, would not be supported. The information contained in this document outlines the Residue Chemistry Science Assessments with respect to the Reregistration Eligibility Decision (RED) for tau-fluvalinate.

Tau-Fluvalinate

RED: Residue Chemistry Considerations

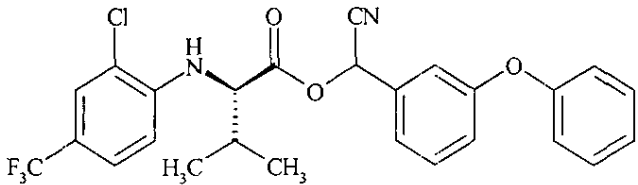
Barcode: D300204

Regulatory Recommendations and Residue Chemistry Deficiencies

HED has examined the residue chemistry database for tau-fluvalinate. There are no residue chemistry issues that would preclude reregistration of tau-fluvalinate for use in beehives.

Background

The PC Code, nomenclature, chemical structure, and physicochemical properties of tau-fluvalinate are listed in the tables below.

Tau-Fluvalinate Residue of Concern.	
Chemical structure	
Common name	Tau-fluvalinate
Molecular Formula	C ₂₆ H ₂₂ ClF ₃ N ₂ O ₃
Molecular Weight	502.93
IUPAC name	(<i>RS</i>)- α -cyano-3-phenoxybenzyl <i>N</i> -(2-chloro- α,α,α -trifluoro- <i>p</i> -tolyl)- <i>D</i> -valinate
CAS name	cyano-(3-phenoxyphenyl)methyl <i>N</i> -[2-chloro-4-(trifluoromethyl)phenyl]- <i>D</i> -valinate
CAS registry number	102851-06-9 (tau-fluvalinate) 69409-94-5 (unresolved fluvalinate)
PC Code	109302

Physicochemical Properties of the Technical Grade Test Compound.		
Parameter	Value	Reference
Boiling point	164 °C at 0.07 mm Hg	Tau-Fluvalinate RED, Product Chemistry Chapter
pH	Not applicable; fluvalinate is practically insoluble in water	
Density, bulk density, or specific gravity	1.262 g/mL at 25 °C	
Water solubility	2.4 ppb at 25 °C	
Solvent solubility at 25 °C	<u>g/100 mL at 25 °C</u> 55.31 in methanol 24.05 in octanol 10.8 in isooctane Miscible at all levels in toluene, acetonitrile, 2-propanol, dimethylformamide, and 1-octanol	
Vapor pressure	<1.0 x 10 ⁻⁵ Pa, 25 °C	

Physicochemical Properties of the Technical Grade Test Compound.		
Parameter	Value	Reference
Dissociation constant, pK _a	Not applicable due to the instability of fluvalinate under acidic and basic conditions and extremely low water solubility.	
Octanol/water partition coefficient	P _{ow} >10 ⁶ , 25 °C	
UV/visible absorption spectrum	Not available	

RESIDUE CHARACTERIZATION

General Discussion on Residue Chemistry of Tau-Fluvalinate

860.1200 Directions for Use

Product List

A 6/30/2004 product registration query of the Agency's OPPIN database identified one end-use product (EP) containing tau-fluvalinate as the active ingredient which is registered to Wellmark International for food/feed uses. This EP, as well as all active Special Local Need (SLN) registrations, are listed in Table 1.

EPA Reg. No./SLN No.	Acceptance Date	Formulation	Product Name
2724-406	07/09/2002	10.25% Impr	Zoecon® RF-318 Apistan® Strip
CA960010 ¹	--	2 lb/gal EC	Mavrik Aquaflow® Insecticide
CA040022 ¹	--	2 lb/gal EC	Mavrik Aquaflow® Insecticide
OR990046 ^{1,2}	--	2 lb/gal EC	Mavrik Aquaflow® Insecticide

¹ The parent product (EPA Reg. No. 2724-478) for this SLN is not registered for any Section 3 use on food/feed crops.

² Cancellation of this product has been requested (69FR51286, 08/18/2004; cancellation order to be issued 02/14/2005 unless request is withdrawn).

Use Pattern Table

A comprehensive summary of the registered food/feed use patterns of tau-fluvalinate is presented in Table 2. A tabular summary of the residue chemistry science assessments for reregistration of tau-fluvalinate is presented in Table 3. The conclusions listed in Table 3 regarding the reregistration eligibility of tau-fluvalinate food/feed uses are based on the use patterns registered by the basic producer, Wellmark International. All currently registered tau-fluvalinate EPs are registered by Wellmark.

Tau-Fluvalinate RED: Residue Chemistry Considerations Barcode: D300204

Table 2. Food/Feed Use Patterns Subject to Reregistration for Tau-Fluvalinate (PC Code 109302).

Site	Application Type Application Timing Application Equipment	Formulation [EPA Reg. No.]	Single Application Rate (ai)	Maximum Number of Applications	Minimum Retreatment Interval (Days)	Use Limitations
Beehives						
	Treatment of beehives Insecticidal strips	10.25% Impr [2724-406]	One strip per each 5 combs of bees or less per brood chamber	Not applicable (NA)	NA	Strips are to remain in hives for at least 6 weeks and not more than 8 weeks. Honey supers must be removed prior to application of strips and during the control period. The use of beeswax for human consumption (including honeycomb, chunk honey, and wax for confectionery purposes) following treatment is prohibited. The placement of strips in contact with combs containing honey for human consumption is prohibited.
Carrots and Brassica Seed Crop and Cole Crops grown for seed						
	Broadcast spray application Postemergence Ground or aerial	2 lb/gal EC [CA040022] [CA960010] [OR990046] †	0.05-0.15 lb/A	Not specified	5 days	Use limited to carrots grown for seed in CA and OR. Application is to be made in a minimum of 5 gal/A and repeated as needed. The restricted entry interval is 12 hours. The use or distribution of the treated plant, including green chop, hay, pellets, meal, whole seed, cracked seed, or seed screenings, for food or feed purposes is prohibited.

† Cancellation of this product has been requested (69FR51286, 08/18/2004; cancellation order to be issued 02/14/2005 unless request is withdrawn).

860.1300 Nature of the Residue - Plants

The nature of the residue for use of tau-fluvalinate in beehives is understood. The registered use does not involve the direct application of tau-fluvalinate to honey, but involves the possible transfer of secondary residues from tracking by the bee colony as they make contact with the insecticide strips. Therefore, the risk assessment team has determined that only the parent compound, tau-fluvalinate *per se*, is the residue of concern.

Currently, there are no registered uses of tau-fluvalinate on plant commodities (use on carrots is a non-food use). HED had previously concluded (G. Herndon memo of 2/13/92 concerning PP#0F03847) that the available plant metabolism studies with alfalfa and apples were adequate to support the registered uses of fluvalinate on coffee and pending import tolerances for apples, kiwi, and oriental pears. The residue of concern is fluvalinate *per se*. Fluvalinate is metabolized to decarboxy-fluvalinate (minor pathway) or is cleaved to form anilino acid and phenoxybenzyl alcohol (major pathway), each of which are conjugated to carbohydrates before incorporation into the carbon pool. HED noted that an additional plant metabolism study would be required to support the registration of any other uses of fluvalinate (or tau-fluvalinate) on food/feed crops. The registered use of fluvalinate on coffee has been canceled, and the import tolerances for fluvalinate are no longer being pursued.

860.1300 Nature of the Residue - Livestock

There are currently no registered uses of tau-fluvalinate on any livestock feed item. Therefore, data pertaining to the nature of the residue in livestock are not required.

HED had previously concluded that the qualitative nature of the residue in animals was adequately understood based on the results of acceptable ruminant and poultry metabolism studies (B. Cutchin memo of 6/16/95 concerning PP#0F03347). The residue of concern in livestock commodities was determined to be fluvalinate *per se*.

860.1340 Residue Analytical Methods

The requirements for residue analytical methods are fulfilled for purposes of reregistration. A GC/ECD method is available for the enforcement of tolerances for residues of tau-fluvalinate in honey; this method has been forwarded to FDA for publication in PAM Vol. II. This method has a limit of detection of 0.01 ppm. Residue data for honey were collected using this GC/ECD enforcement method.

Acceptable methods are available for enforcement and data collection purposes for both plant and animal commodities. The Pesticide Analytical Manual (PAM) Volume II lists Method I, a GC method with electron capture detection (ECD), for the enforcement of tolerances for tau-fluvalinate residues of concern in/on plant and animal commodities. The stated limits of quantitation are 0.01 ppm for plant commodities (except oil) and animal commodities, and 0.02 ppm for oil. These methods are not currently required to support reregistration of tau-fluvalinate, as there are no registered uses on any plant or animal commodities.

860.1360 Multiresidue Methods

The FDA PESTDATA database dated 11/01 (PAM Volume I, Appendix I) indicates that fluvalinate is completely recovered (average recovery >80%) using multiresidue methods Sections 302 (Luke method; Protocol D) and 303 (Mills, Onley, Gaither method; Protocol E, nonfatty). Recovery using Section 304 (Mills Method; Protocol F, fatty food) was variable (47-96%).

860.1380 Storage Stability

Adequate storage stability data are available to support the established tolerance. Storage stability studies have been submitted demonstrating that residues of tau-fluvalinate are stable in honey for up to 6 months of frozen storage, and in/on apples, cabbage, lettuce, and tomatoes for up to 8 months of storage.

860.1400 Water, Fish, and Irrigated Crops

Tau-fluvalinate is presently not registered for direct use on water and aquatic food and feed crops; therefore, no residue chemistry data are required under this guideline topic.

860.1460 Food Handling

Tau-fluvalinate is presently not registered for use in food-handling establishments; therefore, no residue chemistry data are required under this guideline topic.

860.1480 Meat, Milk, Poultry, and Eggs

Currently, there are no registered uses of tau-fluvalinate on any livestock feed item, and there are no registered direct animal treatments of tau-fluvalinate to livestock. Therefore, no residue chemistry data are required under this guideline topic.

860.1500 Crop Field Trials

The reregistration requirements for magnitude of the residue in/on honey have been satisfied. Residues of tau-fluvalinate were below the limit of detection (<0.01 ppm) in all samples of honey from the brood and super layers, except one, taken 0, 28, 42, and 70 days following placement of 10% Impr strips in beehives; the strips were removed after 42 days, and the honey supers were not removed during treatment. One honey sample from the brood layer bore detectable residues at 0.015 ppm. Residues were also found to be <0.01 ppm in honey from hives treated at exaggerated rates (2-4x) with longer exposure times.

The above data actually represent an exaggerated rate since honey supers remained in place during treatment (current registration specifies that honey supers be removed during treatment); however, these were the data used to establish the current honey tolerance.

Tau-Fluvalinate

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All previously registered uses of fluvalinate (or tau-fluvalinate) on food/feed crops have been canceled.

860.1520 Processed Food and Feed

There are no processed food/feed items associated with the registered uses of tau-fluvalinate.

860.1650 Submittal of Analytical Reference Standards

As of 7/20/04, an analytical reference standard for tau-fluvalinate is available at the EPA National Pesticide Standards Repository.

860.1850/1900 Confined and Field Accumulation in Rotational Crops

Tau-fluvalinate is presently not registered for use on any annual crop; therefore, no residue chemistry data are required under these guideline topics.

Tau-Fluvalinate

RED: Residue Chemistry Considerations

Barcode: D300204

Table 3. Residue Chemistry Science Assessment for Reregistration of Tau-Fluvalinate (PC Code 109302).			
GLN Data Requirements	Current Tolerances (ppm) [§180.427(a)]	Additional Data Needed?	MRID Nos.
860.1200: Directions for Use	N/A = Not Applicable	No	See Table 2.
860.1300: Nature of the Residue - Plants	N/A	No ¹	00160816 ² 41998801 ³ 43122701 ⁴
860.1300: Nature of the Residue - Animals	N/A	No ⁵	00160815 ² 00162555 ⁶ 43122702 ⁴
860.1340: Residue Analytical Method			
- Plant Commodities	N/A	No	00150616 ⁷ 00159650 ⁸ 40823002 ⁹ 43214110- 43214112 ⁴ 43254601- 43254602 ⁵
- Animal Commodities	N/A	No ¹⁰	00150616 ⁷ 00159650 ⁸
860.1360: Multi-Residue Method	NA	No	See PAM, Vol. I, Appendix II
860.1380: Storage Stability Data			
- Plant Commodities	N/A	No	20954-EUP-19 ¹¹ 41910302 ¹² 41923501 ¹³
- Animal Commodities	N/A	No ¹⁴	
860.1400: Magnitude of the Residue - Water, Fish, and Irrigated Crops	NA	NA	
860.1460: Magnitude of the Residue - Food Handling	NA	NA	
860.1480: Magnitude of the Residue - Meat, Milk, Poultry, Eggs			
- Milk and the Fat, Meat, and Meat Byproducts of Cattle, Goats, Hogs, Horses, and Sheep	None established ¹⁵	No ¹⁶	PP#1G2520 ¹⁷
- Eggs and the Fat, Meat, and Meat Byproducts of Poultry	None established ¹⁵	No ¹⁶	00150616 ⁷
860.1500: Crop Field Trials			
Root and Tuber Vegetable Group (Group 1)			
- Carrot	None established	No ¹⁸	
Miscellaneous Commodities			
- Coffee, beans	None established ¹⁵	No ¹⁹	40053601 ²⁰ 42044201 ²¹
- Cotton, seed, and gin byproducts	None established ¹⁵	No ²²	00150616 ⁷
- Honey	0.05	No	PP#9E3745 ²³ 41094001- 41094003 ²⁴ 41145801 ²⁵

Tau-Fluvalinate

RED: Residue Chemistry Considerations

Barcode: D300204

Table 3. Residue Chemistry Science Assessment for Reregistration of Tau-Fluvalinate (PC Code 109302).			
GLN Data Requirements	Current Tolerances (ppm) [§180.427(a)]	Additional Data Needed?	MRID Nos.
860.1520: Processed Food/Feed			
- Coffee	None established	No ¹⁹	40053601 ²⁰ 42044201 ²¹
- Cotton	None established ¹⁵	No ²²	00150616 ⁷
860.1650: Submittal of Analytical Reference Standards	N/A	No	
860.1850: Confined Accumulation in Rotational Crops	N/A	N/A ²⁶	
860.1900: Field Accumulation in Rotational Crops	N/A		

Tau-Fluvalinate

RED: Residue Chemistry Considerations

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1. No plant metabolism studies are required to support the registered use on honey.
2. CB No. 510, 6/11/86, F. Suhre.
3. DP Barcode D168401, 2/6/92, G.J. Herndon.
4. DP Barcodes D204144, D204145, and D204179, 3/10/95, G.J. Herndon.
5. Animal metabolism studies are not required to support the registered uses of tau-fluvalinate.
6. CB Nos. 1381 and 1382, 9/29/87, E. Haeberer.
7. CB Nos. 111 and 112, 1/4/85, M. Firestone.
8. CB No. 997, 6/4/86, M. Firestone.
9. CB No. 4416, 12/9/88, J. Stokes.
10. Animal commodity methods are not required to support the registered uses of tau-fluvalinate.
11. Memorandum of 6/2/83, A. Rathman.
12. DP Barcodes D169773 and 169777, 4/27/92, G.J. Herndon.
13. DP Barcode D166536, 12/4/91, F. Toghrol.
14. Storage stability data for animal commodities are not required to support the registered uses of tau-fluvalinate.
15. The established tolerances for these commodities were revoked on 07/31/02.
16. There are no registered uses of tau-fluvalinate on any crops with livestock feed items.
17. Data were submitted in support of PP#1G2520/FAP#1H5304 and were reevaluated in Reference 7.
18. The SLN uses of tau-fluvalinate on carrots grown for seed have been determined to be a nonfood use.
19. The previously registered use of fluvalinate on coffee beans has been canceled.
20. CB No. 1907, 9/25/87, E. Haeberer.
21. DP Barcode D170246, 8/6/92, W. Wassell.
22. All registered uses of tau-fluvalinate on cotton have been canceled.
23. CB Nos. 5042-5044, 4/6/89, J. Stokes.
24. CB No. 5355, 6/1/89, J. Stokes.
25. CB No. 5530, 7/21/89, J. Stokes.
26. There are no registered uses of tau-fluvalinate on annual crops.

TOLERANCE REASSESSMENT SUMMARY

Tolerance Reassessments for Tau-Fluvalinate

The tolerance listed in 40 CFR §180.427 (a) is expressed in terms of (alpha *RS,2R*)-fluvalinate *per se* [(*RS*)-alpha-cyano-3-phenoxybenzyl (*R*)-2-[2-chloro-4-(trifluoromethyl)anilino]-3-methylbutanoate]. The tolerance expression should be revised to reflect the correct common name and the CAS name as follows: "Tolerances are established for residues of the insecticide tau-fluvalinate [cyano-(3-phenoxyphenyl)methyl N-[2-chloro-4-(trifluoromethyl)phenyl]-D-valinate]".

All tolerances for residues of fluvalinate in animal, coffee, and cotton commodities were revoked (Federal Register notice of 7/31/2002).

Tolerances Listed Under 40 CFR §180.427 (a): Adequate data are available to reassess the established tolerance for honey at the same level. However, based on the available data, the established tolerance may be reduced from 0.05 ppm to 0.02 ppm.

Proposed Tolerances

PP#1E4020 and FAP#2H5619: Sandoz, the previous registrant of fluvalinate, had proposed the establishment of import tolerances for residues of fluvalinate *per se* in/on apples, kiwi, and oriental pear, and an increase in the established tolerance for cattle fat. HED had recommended in favor of this tolerance and a proposed rule was published in the Federal Register (61 FR 24911, 5/17/96). However, in a memo dated 9/10/97, HED recommended against the proposed tolerances because the toxicology database was insufficient to estimate an aggregate risk level under FQPA.

A summary of tau-fluvalinate tolerance reassessment is presented in Table 4.

Table 4. Tolerance Reassessment Summary for Tau-Fluvalinate.				
Commodity	Current Tolerance (ppm)	Range of Residues (ppm)	Tolerance Reassessment (ppm)	Comment/[Correct Commodity Definition]
Tolerance Listed Under 40 CFR §180.427 (a):				
Honey	0.05	<0.01-0.015	0.02	

Codex/International Harmonization

No Codex MRLs have been established for tau-fluvalinate; therefore, issues of compatibility between Codex MRLs and U.S. tolerances do not exist. A Mexican MRL of 0.1 mg/kg has been established for cottonseed. No Canadian MRLs have been established for fluvalinate or tau-fluvalinate. We note that tau-fluvalinate is registered for use in Canada in honey bee chambers; this use presumably falls under the PMRA General MRL of 0.1 mg/kg. [Regulation B.15.002(1) of the Canadian Food and Drugs Regulations (FDR) establishes 0.1 ppm as the "General Maximum Residue Limit." This regulation states that a food is adulterated if it contains residues of a pesticide at a level greater than 0.1 ppm unless a specific MRL has been established in Table II, Division 15 of the FDR.]

BIBLIOGRAPHY**Study Citations**

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00159650 Fitch, W. (1986) Residue Determination of Fluvalinate: Method No. 079-0386-2. Unpublished study prepared by Zoecon Corp. 30 p.

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41998801 Skinner, W.; Dennis, P. (1991) Metabolites of Fluvalinate in Alfalfa Forage: Lab Project Number: 480605: 12: DP-300375. Unpublished study prepared by Sandoz Crop Protection Corp. 164 p.

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43122701 Pierotti, M.; Wisson, M. (1993) Metabolism of Fluvalinate by Apples: Final Report: Lab Project Number: 480605. Unpublished study prepared by Sandoz Agro, Inc. Sponsor ID Number 301400. 204 p.

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43214112 Sandoz Agro, Ltd. (1992) Analytical Method for Fluvalinate Matrix: Apples: Lab Project Number: BS 3282. Unpublished study prepared by LARA (Associated Agricultural Research Labs.). 7 p.

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43254602 Thier, H.; Zeumer, H., ed. (1987) Organochlorine, Organophosphorus, Nitrogen-Containing and Other Pesticides. P. 383-400 in Manual of Pesticide Residue Analysis-Volume I. New York, NY: VCH.

Agency Memoranda Citations

Table 5. Agency Memoranda Citations.								
Date	DP Barcode	CB No.	From	To	MRID Nos.	Subject		
1/4/85	---	111 and 112	M. Firestone	T. Gardner and Toxicology Branch	00150616	PP#4F3153/FAP#4H5444. Fluvalinate (Mavrik®) on Cotton. Evaluation of Analytical Methods and Residue Data.		
6/4/86	---	997	M. Firestone	G. LaRocca and Toxicology Branch	00159650	PP#4F3153/FAP#4H5444 - Fluvalinate (Mavrik®) on Cotton - Evaluation of Amendment Dated May 20, 1986.		
6/11/86	---	510	F. Suhre	Housenger/ Pemberton and Toxicology Branch	00160815 and 00160816	86-WA-04: Metabolism Data in Support of a Section 18 Emergency Exemption for the use of Fluvalinate on Alfalfa in Washington State.		
9/25/87	---	1907	E. Haeberer	H. Jamerson and Toxicology Branch	40053601	PP#7E3493, Fluvalinate on Green Coffee Beans - Evaluation of Analytical Methodology and Residue Data.		
9/29/87	---	1381 and 1382	E. Haeberer	G. LaRocca and Toxicology Branch	00160815, 00162533, 00162553, 00162554, 00162555, and 00162762	PP#5F3189/FAP#5H5451 - Fluvalinate on Numerous Crops, Supplemental Submission of July 10, 1986.		
7/29/88	---	4076	J. Stokes	G. LaRocca and Toxicology Branch	None	Fluvalinate. Comments on the meeting of 7/27/88 with Zoecon and their protocol for miticide use in beehives and discussion of residue data requirements.		
12/9/88	---	4416	J. Stokes	D. Marlow	40823000-40823002	2724-UNA. Fluvalinate in/on honey and beeswax. Method Validation Request.		
1/24/89	---	None	J. Stokes	G. LaRocca and Toxicology Branch	None	Fluvalinate. Comments on the meeting of 1/18/89 with Zoecon in regards to miticide use in package bees and discussion of residue data requirements.		
2/2/89	---	4768	E. Haeberer	H. Jamerson and Toxicology Branch	None	PP#7E3493, Fluvalinate on Green Coffee Beans, Supplemental Submission of December 8, 1988, Amended Section B and F.		

Tau-Fluvalinate

RED: Residue Chemistry Considerations

Barcode: D300204

Table 5. Agency Memoranda Citations.

Date	DP Barcode	CB No.	From	To	MRID Nos.	Subject
4/6/89	—	5042, 5043, and 5044	J. Stokes	G. LaRocca and Toxicology Branch	None	PP#9F3745. Fluvalinate. Miticide use in beehives. Evaluation of Analytical Methodology and Residue Data.
6/1/89	—	5355	J. Stokes	G. LaRocca and Toxicology Branch	41094001-41094003	PP#9F3745. Fluvalinate. Miticide use in beehives. Amendment dated 5/1/89.
7/21/89	—	5530	J. Stokes	G. LaRocca and Toxicology Branch	41145800 and 41145801	PP#9F3745. Fluvalinate. Miticide use in beehives. Addendum (dated 6/23/89) to Zoecon letter of May 11, 1989.
11/6/89	—	None	J. Stokes	G. LaRocca and Toxicology Branch	None	PP#9F3745. Fluvalinate in Beeswax. Results of Petition Method Validation.
11/6/89	—	None	J. Stokes	G. LaRocca and Toxicology Branch	None	PP#9F3745. Fluvalinate in Honey. Results of Petition Method Validation.
12/20/89	—	6070, 6071, and 6072	J. Stokes	G. LaRocca and Toxicology Branch	None	PP#9F3745. Fluvalinate. Miticide use in beehives. Amendment dated 11/29/89.
12/4/91	D166536	8258	F. Toghrol	G. LaRocca/A. Heyward	41923500 and 41923501	Amended Registration (dated 11/6/91) for Fluvalinate (Zoecon RF-318 Apistan® Strip) in/on Honey (Honey Supers Remain on Hive During Treatment). EPA Reg. No. 2724-406.
2/6/92	D168401	8549	G.J. Herndon	G. LaRocca/A. Heyward and Toxicology Branch	41998801	PP#0F3847. Fluvalinate. Evaluation of Metabolism Data in Alfalfa Forage. Amendment of 12/10/90.
4/16/92	D174636	9400	J. Stokes	G. LaRocca	None	002724-00406. Fluvalinate. RF-318 APISTAN Strip. Response to RD Request for Copy of Analytical Methodology CBTS Sent to FDA for PAM II Inclusion.

Table 5. Agency Memoranda Citations.							
Date	DP Barcode	CB No.	From	To	MRID Nos.	Subject	
4/27/92	D169773 and D169777	8733 and 8734	G.J. Herndon	G. LaRocca/A. Heyward and Toxicology Branch	41910300-41910331	PP#1E04020 and FAP#2H05619. Fluvalinate on Imported Apples, Hops, Kiwi, Nashi, and Related Products. Evaluation of Analytical Method and Residue Data.	
8/6/92	D170246	8790	W. Wassell	H. Jamerson and Toxicology Branch II	42044201	PP#2E04035. Fluvalinate (Mavrik Aquaflow® Insecticide, EPA Reg. No. 55947-101) in or on Coffee. Evaluation of analytical method and magnitude of residue data.	
8/28/92	D175717	9588	G.J. Herndon	G. LaRocca/A. Heyward	None	PP#0E03847 and PP#1E04020. Fluvalinate. Evaluation of Metabolism Data in Alfalfa Forage for Tolerances on Imported Apples, Hops, Kiwi, Nashi, and Related Products. Request for Clarification of 2/13/92 Memo.	
9/3/92	D179494	10055	J. Stokes	G. LaRocca/A. Heyward	None	#002724-00406. Fluvalinate. ZOECON RF-318 APISTAN STRIP. Amendment dated May 29, 1992.	
6/1/93	D190961	11837	J. Garbus	G. LaRocca/L. Arrington	None	PA-93-0003: Special Local Need Label [24(c)] for Fluvalinate (Mavrik) for Use in Pennsylvania in/on Pre-Nuclear Seed Potatoes.	
11/22/94	D209046	14669	M. Flood	G. LaRocca/A. Heyward	None	Fluvalinate Technical, EPA Reg. No. 55947-104. Proposed Change in Nomenclature. Sandoz Agro Letter Dated 10/19/94.	
3/10/95	D204144, D204145, and D204179	13822, 13823, and 13854	G.J. Herndon	G. LaRocca/A. Heyward and J. Smith	43122701, 43122702, 43214101-43214112, 43249701, 43249702, 43254601, and 43254602	PP#1E04020 and FAP#2H05619. Fluvalinate on Imported Apples, Hops, Kiwi, Nashi, and Related Products. Responses of Sandoz, Inc. (Received on 4/29/94, 5/3/94, and 6/6/94) to Memo of G.J. Herndon dated 4/29/92.	
11/28/95	D214789	15489	G.J. Herndon	G. LaRocca/A. Heyward and K. Whitby	None	PP#1E04020 and FAP#2H05619. Fluvalinate on Imported Apples, Hops, Kiwi, Nashi, and Related Products. Responses of Sandoz, Inc. to Memo of G.J. Herndon dated 3/15/95.	

Tau-Fluvalinate

RED: Residue Chemistry Considerations

Barcode: D300204

Agency Memoranda Citations.						
Date	DP Barcode	CB No.	From	To	MRID Nos.	Subject
6/27/96	D227052	None	G.J. Herndon	A. Heyward/G. LaRocca	None	ID# CA960010. Section 24(c) Special Local Need Registration for Use of Fluvalinate on Carrots Grown for Seed in California.
9/10/97	D214788, D214789	None	P. Hurley	A. Heyward	None	PP#1E04020. Tau-Fluvalinate on Imported Apples, Oriental Pears, and Kiwi Fruits.



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R106403

Chemical:	Fluvalinate
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