METHOXYFENOZIDE

First draft prepared by Prof. Dr. A Ambrus, Hungarian Food Safety Office, Budapest, Hungary

EXPLANATION

Methoxyfenozide was evaluated by the JMPR for residues and toxicology in 2003, when an ADI of 0–0.1 mg/kg bw and an acute reference dose of 0.9 mg/kg bw were established and maximum residue levels, supervised trial median residues and highest residues, were recommended for a number of commodities.

The Meeting concluded that the residue should be defined as methoxyfenozide for compliance with MRLs and for dietary intake estimation in both plant and animal commodities. The compound is fat-soluble in its distribution between meat muscle and fat, but not in its distribution in milk.

In addition, the 2006 JMPR estimated a maximum residue level, HR and STMR values for cranberry.

The present Meeting was provided with supervised trial data on citrus fruits, small fruits and berries, tropical fruits with inedible peals, cucurbits, legume vegetables, pulses root and tuber vegetables. Information was also provided for analytical methods, stability of residues in stored analytical samples, and effect of processing on orange, sugar beet, peanut and soya bean.

Methods of residue analysis

The analytical methods used in the supervised trials were fully validated. The recovery values reported at various fortification levels are summarized in Table 1.

Blueberry, Orange and its processed fractions, sweet potato, peanut nutmeat, oil and hay

The in-house method applied was a modified version of Dow AgroSciences GRM 02.25 method. The methoxyfenozide residues were extracted from whole fruit and dried orange pulp samples using acetonitrile/water or methanol and 0.1N hydrochloric acid and hexane for orange oil. The orange juice samples were applied directly to SPE cartridge. Purification of the extract was accomplished by using a Strata-X SPE cartridge or a Silica SPE cartridge (in the case of orange oil). The purified extract was concentrated, and analysed with LC/MS/MS. The limits of quantification (LOQ) for the method were 0.02 mg/kg for whole fruit, 0.02 mg/kg for dried pulp, 0.009 mg/kg for orange juice, 0.07 mg/kg for orange oil and 0.01 mg/kg for other commodities.

Mandarin

Residues of methoxyfenozide were determined according to method 00551. After maceration and extraction with acetonitrile/water, filtration and clean up on a ChemElute followed. The residues were eluted with dichloromethane, the eluate was evaporated to dryness and redissolved in deuterated internal standard solution in acetonitrile/water (1/1, v/v). Finally, the residues were determined by LC/MS/MS using an electrospray interface.

Beans and peas (both succulent and dry), carrot, cranberry, papaya, radish, sugar beet and strawberry

Samples were analysed using an in-house method based on the combination of procedures developed for analysis of pome fruits and cottonseed (Rohm and Haas Technical Reports 34-98-87 and 34-96-88). The samples were extracted with acidic methanol/water mixture; the concentrated extract was

purified with hexane, methylene chloride liquid-liquid partition, basic alumina, or Florisil and silicagel column chromatography or C-18 solid phase extraction. The residues were detected with HPLC-UV or HPLC/MS/MS. The confirmation of residues was carried out with HPLC/MS/MS. The reported LOQs were as follows: 0.05 mg/kg for edible podded bean and pea and foliage, sugar beet roots and tops, and papaya; 0.01 mg/kg for cranberry, strawberry, and refined sugar.

Cantaloupe, cucumber and squash

The residues were extracted acidic methanol. The extract was purified by hexane and methylene chloride liquid-liquid partition and on Florisil or C-18 cartridge. The quantitation was carried out by HPLC-UV detection. The LOQ was 0.01 mg/kg.

Principally the same method was applied for avocado but the residues were quantified by LC/MS/MS with a validated LOQ of 0.01 mg/kg.

Soya bean

Residues of methoxyfenozide and its metabolites in the study samples were analysed using the analytical method GRM 02.24. This method was developed by Dow AgroSciences to analyse for residues of methoxyfenozide, hydroxy-methoxyfenozide and the total glucose sugar conjugates of methoxyfenozide (glucose and malonyl) determined as the glucose conjugate. Sample aliquot of 5 gram was extracted with a 90/10 methanol/water solution. The samples were then shaken on a reciprocating shaker and centrifuged, heated for 90 minutes and concentrated to dryness with nitrogen. The residual material was reconstituted with 90% methanol/l0% water, diluted with water and purified using solid phase extraction (SPE) plate. The eluate was evaporated to dryness and the residues reconstituted in a 70% water/30% acetonitrile mobile phase containing 0.1% formic acid. The residues were determined by high performance liquid chromatography with positive ion electrospray (ESI) tandem mass spectrometry (LC/MS/MS). The limit of detection (LOD) and limit of quantitation (LOQ) were set at 0.006 mg/kg and 0.02 mg/kg, respectively for methoxyfenozide and its hydroxy metabolite and 0.015 mg/kg (LOD) and 0.05 mg/kg (LOQ) for the sugar conjugate in soya bean crop matrices.

Table 1 Recoveries of methoxyfenozide residues from various matrices

Crop	No	Spike level mg/kg	Recovery %	
			Average	Range
Orange	6	0.05	87	81–93
	7	0.5	90	86–93
	3	1.0	89	85–92
	3	5.0	90	84–94
Dried orange pulp	6	0.05	76	72–82
	6	0.5	85	80–89
	3	1.0	85	84–86
	3	5.0	89	87–92
Orange juice	6	0.05	92	89–94
	3	0.5	98	96–100
	3	1.0	94	92–95
	3	5.0	98	96–99
Orange oil	6	0.2	100	98–106
	3	1.0	107	102–114
	4	2.0	92	87–96
	3	20.0	100	99–100
Mandarin fruit and pulp	8	0.05–50	97	92–101
Mandarin peel	8	0.05–50	90	84–95
Blueberry	4	0.003	86	81–93
	1	0.006	93	
	10	0.01	90	83–96

Crop	No	Spike level mg/kg	Recovery %	
			Average	Range
	5	0.1	94	92–96
	3	1.0	93	93–94
	5	2.0	93	89–96
Cranberry	5	0.01	97	76–109
	3	0.1	82	78–85
	9	1	83	76–96
Strawberry	3	0.01	129	119–136
	3	0.05	109	102–108
	12	1	90	65–100
	6	10	96	92–97
Avocado	15	0.1–1	96	63–109
Papaya	18	0.05–5	98	85–107
Carrot				
Radish, root	6	0.05	99	93–115
Radish tops	6	0.05–0.5	106	101–117
Sugar beet roots	9	0.05	98	88–110
	18	0.5	88	84–98
	3	10	85	78–88
Sugar beet tops	0.05	9	102	89–118
	1	3	96	93–102
	5	12	86	83–94
	20	3	80	73–85
Sweet potato	24	0.01–2.0	83 □ 5	
Cantaloupe	18	0.01–5	93	50–118
Cucumber	14	0.01–1	104	83–122
Black eyed pea	18	0.05–5	95	87–114
Bean, succulent	15	0.05–1	93	75–110
Pea with edible pod	18	0.05–15	96	68–118
Peanut hay	31	0.01–50	91	69–120
Peanut meal	21	0.01–2	88	73–112
Peanut meat	24	0.01–2	87	77–111
Peanut oil	21	0.01–2	88	70–111
Soya bean forage	16	0.02–50	95 ± 13	
Soya bean hay	15	0.02–200	104 ± 8	
Soya bean seed	14	0.02–5	87 ± 11	
Processed fractions	12	0.02–600	105 ± 15	
Soya bean forage	14	0.02–1	87 ± 11	
Soya bean hay	13	0.02–1	90 ± 6	
Soya bean seed	14	0.02–5	79 ± 12	
Processed fractions	10	0.02–10	100 ± 4	
Soya bean forage	14	0.05–1	79 ± 8	
Soya bean hay	13	0.05–2	85 ± 10	
Soya bean seed	14	0.05–1.5	74 ± 5	
Processed fractions	10	0.05–0.5	100 ± 7	

Stability of residues in stored analytical samples

Storage stability tests performed with samples spiked at 1 mg/kg levels and indicated that the residues were stable in apples, apple juice, tomatoes, lettuce, cotton seed and cottonseed processed products typically over a year storage period (JMPR 2003). The storage stability of carrots, beans and soya beans are covered with the studies reported by the 2003 JMPR. The results of storage stability tests for other commodities are summarized in Table 2.

Table 2 Stability of residues during frozen storage

Commodity	Max period for samples stored (days)	Stability of residues tested for days	No of tests	Spike level (mg/kg): Percentage survived
Orange	658	629	3	1.0: 88–89%
Orange pulp	411	405	3	1.0: 86–89%
Orange juice	413	403	3	1.0: 101–104%
Orange oil	420	400	3	1.0: 78–85% [a]
Peas, in pod	321	291	3	0.1: 64% [b]
Peas, foliage	331	298	3	1.0:103%
Radish tops	316	286	3	0.5: 100%
Radish root	307	286	3	0.5: 86% [c]
Sugar beet roots	287	471	3	1.0: 88%
Sugar beet tops	363	474	3	1.0: 87%
Refined sugar	375	457	3	1.0: 78%
Sugar beet molasses	391	451	3	1.0: 85%
Sugar beet dried pulp	381	455	3	1.0: 85%
Sweet potato	184	435	3	0.1: 96%
Peanut nutmeats	230	435	3	0.1: 104 ± 6%
Peanut meal	215	435	3	0.1: 105 ± 5%
Peanut oil	209	435	3	0.1: 94 ± 4%
Peanut hay	236	435	3	0.1: 84 ± 2%

[a] The 3rd test gave a survived residue of 178%, which was assumed to be the result of an error in sample preparation

[b] It corresponds to 81% if compared to the average concurrent recoveries (79%)

[c] It corresponds to 107% if compared to the average concurrent recoveries (80%)

USE PATTERNS

Methoxyfenozide is effective against Lepidopterous pest species and its use is registered on a wide range of crops. The usage patterns covering the range of crops on supervised trials, which were submitted for evaluation by the 2009 JMPR are summarised in Tables 3 and 4.

Table 3 Registered uses of methoxyfenozide in the USA applying in 22.6% SL formulation

Crop	Application [a]		Spray		PHI, days
	Method	Rate kg ai/ha	Number	Interval	
Citrus	G	0.134–0.28 [b]		14	1
Avocado		0.18–0.28	5	6	2
Beans, dry		0.135–0.28	4	7–14	7
Bush berries	G,A	0.13–0.28	3	7	7
Cucurbit vegetables	G,A	0.067–0.18[b]	4	7	3
Cranberry	G,A	0.18–0.28		10–18	14
Legume vegetables	G,A	0.18–0.28	4	7–14	7
Papaya	G,A	0.21–0.28	5	10	3
Peanut	G,A	0.1–0.18	3	7	7
Peas, dry	G,A	0.18–0.28	4	7–14	7
Root vegetables	G, A	0.1–0.28		14	7
Soya bean	G,A	0.067–0.134	4		7[2]
Strawberry	G,A	0.1–0.21		10–14	3
Tuber and corm vegetables	G,A	0.1–0.18	3	14	7

[a] 2. 7 days for hay and forage and 14 days for seed

[b] Do not make more than three consecutive applications with methoxyfenozide. Do not apply more than 1.12 kg ai/ha in one growing season. Apply in a minimum of 189 and 379 L/ha on trees smaller than 3 m and higher than 3 m, respectively. Select adjuvants that are recommended and registered for specific use pattern.

According to the US commodity classification the crops belonging to the groups indicated in Table 3 are as follow:

Dry beans (beans, dry, seed): *Cicer arietinum* (chick peas or garbanzo beans); *Lupinus* spp. (grain lupine, sweet lupine, white lupine and white sweet lupine); *Phaseolus* spp. (kidney beans, lima beans, mung beans, navy beans, pinto beans, snap beans and waxbeans); *Vicia faba* (broad beans and fava beans); *Vigna* spp. (asparagus beans, blackeyed peas and cowpeas).

Bushberries: black currant, elderberry, gooseberry, highbush blueberry, huckleberry, lowbush blueberry and red currant.

Legume vegetables: the group includes but is not limited to: Asparagus Bean, Blackeyed Pea, Chinese Longbean, Cowpea, Dwarf Pea, Edible-Pod Pea, English Pea, Garden Pea, Green Lima Bean, Green Pea, Jackbean, Moth Bean, Pigeon Pea, Runner Bean, Snap Bean, Snow Pea, Soya bean (Immature Seed), Southern Pea, Succulent Broad Bean, Sugar Snap Pea, Sword Bean, Wax Bean and Yardlong Bean.

Root vegetables: Beet, garden; beet, sugar, burdock, edible; carrot; celeriac; chervil, (subgroup turnip—rooted); chicory; ginseng; horseradish; parsley (turnip-rooted); parsnip; radish; radish (oriental); rutabaga; salsify; salsify (black); salsify (Spanish); skirret; and turnip. Representative crops: Carrot, potato, radish and sugar beet.

Tuber and corm vegetables: arracacha, arrowroot, bitter cassava, chayote (root), Chinese artichoke, chufa, dasheen, edible canna, ginger, Jerusalem artichoke, leren, sweet cassava, sweet potato, tanier, true yam, turmeric and yam bean.

Table 4 Registered uses of methoxyfenozide in Europe applying in 240 g/L SC formulation

Crop	Country	Application [a]	Spray			PHI, days
		Rate kg ai/ha	Conc., kg ai/hl	Number	Interval	
Citrus	Greece	0.192	0.0096	2	10	14
Clementine	Italy	0.144–0.288	0.0096	2	10	14
Mandarin	Italy[1]	0.144–0.288	0.0096	2	10	14
Orange,	Italy	0.144–0.288	0.288	2	10	14
Orange, mandarin	Portugal	0.144–0.192	0.0064–0.0072	1–2	10	14
Orange, mandarin	Spain	0.144–0.192	0.0064–0.0072	1–2	10	14

a Ground application

RESIDUES RESULTING FROM SUPERVISED TRIALS ON CROPS

The Meeting received information on supervised field trials on the following crops.

Commodity	Table
Citrus fruits (USA)	5
Oranges (South Europe)	6
Mandarin (South Europe)	7
Blueberry (USA)	8
Cranberry (USA)	9
Strawberry (USA)	10
Avocado	11
Papaya	12

Commodity	Table
Cantaloupe	13
Cucumber	14
Summer squash	15
Beans, in pods	16
Beans, succulent shelled	17
Peas, succulent shelled	18
Dry beans	19
Cowpea, (black eyed pea)	20
Soya bean	21
Carrot	22
Radish	23
Sugar beet	24
Sweet potato	25
Peanut	26
Bean forage	27
Sugar beet tops	28
Peanut fodder	29
Soya bean forage	30
Soya bean hay	31

Most of the trials were conducted within the programme of IR-4 in the USA, some trials were from Europe and residue data on soya bean was obtained from trials carried out by Dow AgroSciences in the USA. The location of the trials, unless listed separately, is indicated with the code of States in the identification code of the trials.

The trials were performed according to the GLP principles. In most trials duplicate random samples were taken from each experimental area. The highest residue was selected from each plot for further evaluation.

Where more than one trial was conducted at the same site and the trials could not be considered independent, only one residue value was selected from one site. The decision on the independence of the trials requires careful evaluation of the conditions of their implementation. The Meeting may consider independent those trials which involve different varieties or cultivars. However, the trials are generally not considered independent where the first treatments were made and or the crops are harvested within a short period of time, the same application equipment was used, different irrigation methods were applied or different formulations were used.

The residue values used for estimation of maximum residue levels and median values are underlined in the following tables.

Citrus fruits

Seven supervised trials were conducted on orange (3) lemon (2) and grapefruit (2) in California and Texas during the 2005 and 2006 growing seasons with four foliar applications of SC formulation at

the maximum US GAP. An adjuvant was added to the spray mixtures except in one trial (06-CA142) where the fruits were taken were used to study the effect of processing on residues.

The samples were analysed with the slightly modified version of Dow AgroSciences GRM 02.25.

Field residue trials on four mandarin varieties were performed with a 240 g/L SC formulation in Italy, Portugal, Greece and Spain. Samples were taken 14 days after the 2nd treatment. The sampled mandarins were separated into fruit, peel and pulp.

Table 5 Residues in/on orange fruit treated with SL formulation of methoxyfenozide in supervised trials in the USA in 2005-2006 (IR-4 PR No. 09367)

Location, Crop Variety	Application			Total/ season, kg ai/ha	PHI, days	Residue, mg/kg		Report No.
	kg ai/ha	No	Interval days					
GAP, USA Citrus fruits	0.134–0.28		14		1			
For ground application use a minimum of 470–935 L/ha to provide full foliar coverage								
Lindcove, CA, Oro blanco grapefruit	0.285–0.29	4	14	1.14	1	0.28	0.23	05-CA114
Exeter, CA, Atwood Navel orange	0.28–0.29 [a]	4	14	1.13	1	0.17	0.14	05-CA115
Exeter, CA, Lisbon lemon	0.28 [a]	4	14	1.12	1	0.37	0.41	05-CA116
Riverside, CA, Bonanza Navel orange	0.28 [a]	4	14–17	1.12	1	1.7	1.6	05-CA117
Riverside, CA, Lisbon lemon	0.28	4	14–17	1.12	1	0.93	0.65	05-CA118
Exeter, CA, Pehrson Valencia orange	1.12 [b]	1		1.12	3		0.245	06-CA142
La Feria, TX, Rio red grapefruit	0.28		13–21 [a]	1.12	1	0.12	0.11	05_TX30

[a] The last treatment was made 21 days after the previous one

[b] Used for processing

Table 6 Residues in/on oranges treated with SC formulation of methoxyfenozide in supervised trials in South Europe in 2005 and 2006

Country Variety		Application			PHI, days	Residue, mg/kg	Report No.
		kg ai/ha	No	Interval days			
Orange	0.144–0.288 (Italy) 0.144–0.192 ES,PO,GR		2	10	14		
Application rate minimum 2000–3000 L/ha depending on tree height							
Italy, Navelina	SC	0.192	2	10	0 [a]	0.09	34-99-02/703745
					0	0.31	
					7	0.21	
Whole fruit					14	0.20	
Peel						0.57	
Pulp						< 0.05	
Whole fruit					21	0.21	
Spain, Consumo	SC	0.288, 0192	2	10	0 [a]	0.18	34-99-02/705195
					0	0.37	
					7	0.22	
Whole fruit					14	0.22	
Peel						0.94	
Pulp						< 0.05	
Whole fruit					21	0.26	

Country Variety		Application kg ai/ha	No	Interval days	PHI, days	Residue, mg/kg	Report No.
Spain, Consumo	SC	0.24, 0.192	2	10	0 [a]	0.19	34-99-02/703753
					0	0.32	
					7	0.27	
Whole fruit					14	0.34	
Peel						0.95	
Pulp						< 0.05	
					21	0.25	
Portugal, Dalman	SC	0.192, 0.192	2	11	0 [a]	< 0.05	34-99-02/705209
					0	0.11	
					7	0.10	
Whole fruit					14	0.06	
Peel						0.37	
Pulp						< 0.05	
					21	0.06	
Italy, Navelina	SC	0.192	2	13	0 [a]	0.06	34-99-02/705217
					0	0.20	
					7	0.24	
Whole fruit					14	0.18	
Peel						0.6	
Pulp						< 0.05	
					21	0.18	
Spain, Navelina	2F	0.192	2	10	0	0.18	34-99-133/810533
Whole fruit					14	0.13	
Peel						0.52	
Pulp						< 0.05	
Italy, Navelina	SC	0.192	2	10	0	0,25	34-99-133/810541
Whole fruit					14	0.19	
Peel						0.44	
Pulp							
Portugal, Dalman	SC	0.192	2	10	0	0.17	34-99-133/814857
Whole fruit					14	0.16	
Peel						0.31	
Pulp						< 0.05	
Greece, Navelate	SC	0.192	2	10	0	0.30	34-99-133/814865
Whole fruit					14	0.14	
Peel						1.4	
Pulp						< 0.05	

[a] Residues in whole fruit before the last application

Table 7 Residues in/on mandarin fruits treated with SC formulation of methoxyfenozide in supervised trials in South Europe in 1997 (Study No. RA-2148/97)

Country Variety	Application kg ai/ha [a]	No	Interval days	PHI, days	Residue, mg/kg	Report No.
Mandarin 0.288 (Italy), 0.192 ES,PO,GR		2	10	14		
Application rate minimum 2000–3000 L/ha depending on tree height						
Italy, Monreal	0.192	2	10	0	0.36	34-99-137/810568
Whole fruit				14	0.24	
Peel					0.79	
Pulp					< 0.05	

Country Variety	Application			PHI, days	Residue, mg/kg	Report No.
	kg ai/ha [a]	No	Interval days			
Greece, Satsuma	0.192	2	10	0	0.46	34-99-137/814903
Whole fruit				14	0.27	
Peel					0.84	
Pulp					< 0.05	
Portugal Tangera	0.192	2	10	0	0.28	34-99-137/814911
Whole fruit				14	0.21	
Peel					0.52	
Pulp					< 0.05	
Spain, Orogrande	0.192	2	10	0	0.45	34-99-137/814938
Whole fruit				14	0.35	
Peel					1.38	
Pulp					< 0.05	
Italy, Monreal	0.182	2	10	0 [b]	0.23	RA-2148/97/703761
				0	0.52	
				7	0.32	
Whole fruit				14	0.27	
Peel					0.99	
Pulp					< 0.05	
				21	0.30	
Spain, Marisol	0.192	2	10	0 [b]	0.14	RA-2148/97/703788
Whole fruit				0	0.36	
Whole fruit				7	0.20	
Whole fruit				14	0.13	
Peel					1.0	
Pulp					< 0.05	
				21	0.16	
Spain, Clemenules	0.288	2	10	0 [b]	0.21	RA-2148/97/705284
Whole fruit				0	0.37	
Whole fruit				7	0.38	
Whole fruit				14	0.39	
Peel					1.3	
Pulp					< 0.05	
				21	0.37	
Portugal, -	0.192	2	12	0 [b]	0.14	RA-2148/97/705292
Whole fruit				0	0.23	
Whole fruit				7	0.17	
Whole fruit				14	0.09	
Peel					0.44	
Pulp					< 0.05	
				21	0.11	
Spain, Clemenvilla	0.192	2	10	0 [b]	0.20	RA-2148/97/705306
Whole fruit				0	0.35	
Whole fruit				7	0.42	
Whole fruit				14	0.45	
Peel					1.3	
Pulp					< 0.05	
				21	0.33	

[a] The actual rates were within ± 5% of target rates indicated.

[b] sampling before the last application

Berries and other small fruits

Blueberry

Eight field trials were performed located with three foliar applications of the test substance 6–9 days apart at rates ranging from 0.27 to 0.30 kg ai/ha per application for a total rate range of 0.83 to 0.89 kg ai/ha per season. The LOD and LOQ for the method were calculated to be 0.001 mg/kg and 0.004 mg/kg, respectively.

Table 8 Residues in/on blueberry treated with methoxyfenozide in supervised trials in the USA in 2003 (IR-4 Study No. 07671)

(Variety) Form	Application			Total/ season, kg ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	kg ai/ha	No	Interval days					
GAP, USA Blueberries	0.13–0.28	3	7	1.12	7			
Apply in a minimum of 280 L/ha to provide full foliar coverage								
Jonesboro, ME; Wild Blueberry	0.29	3	7	0.86	6	1.0	1.1	ME01
Chatsworth, NJ; Blueray	0.28	3	7	0.83	7	1.5	1.8	NJ09
Chatsworth, NJ; Bluecrop	0.29–0.3	3	7	0.89	7	1.4	1.2	NJ10
Fennville, MI; Rubel [b]	0.28	3	7	0.84	7	2.0	1.5 [a]	MI11
Fennville, MI; Rubel [b]	0.27–0.28	3	7	0.83	7	1.4	1.0	MI12
Fennville, MI; Rubel [b]	0.27–0.28	3	7	0.83	7	0.85	0.95	MI13
Castle Hayne, NC; Croatan	0.28	3	7,6	0.86	6	0.54	0.51	NC02
Aurora, OR; Bluecrop	0.28	3	7	0.85	7	0.85	0.78 [a]	OR03

[a] Mean of two analyses.

[b] The trials were conducted at the same site with 5 and 3 days apart, thus they were not independent.

Cranberry

Six supervised trials were conducted in Massachusetts, New Jersey, Wisconsin, Oregon, British Columbia (BC) and Canada in 1999. Each treated plot received four foliar broadcast applications of the test substance at a rate of approximately 0.28 kg ai/ha, for a total of approximately 1.12 kg ai/ha.

Table 9 Residues in/on cranberry treated with methoxyfenozide in supervised trials in the USA in 1999 (IR-4 Study No.07355)

Location, Variety	Application			Total/ season, kg ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	kg ai/ha	No	Interval days					
GAP, USA Cranberries	0.18–0.28		10–18	1.12	14			
Apply in a minimum of 94–188 L/ha to provide full foliar coverage								
East Wareham, MA; Early black	0.26–0.28	4	10	1.11	14	0.035	0.028	99-MA01
Tabernacle, NJ; Early Black	3× 0.25 + 0.49	4	8–10	1.24	14	0.37	0.41	99-NJ14
Wisconsin Rapids, WI; Ben Lear	0.27–0.28	4	9–10	1.12	13	0.088	0.10	99-WI09
Biron, WI; Bean Lear	0.28	4	10–13	1.12	13	0.076	0.064	99-WI10
Bandon, OR; Stevens	0.28	4	10–11	1.12	15	0.14	0.16	99-OR13
Delta, BC, Canada; Stevens	0.28	4	9–11	1.12	14	0.26	0.21	99-BC04

Strawberry

Eight field trials were conducted in California (three trials), Georgia, Florida, New Jersey, Oregon, and Ohio with at least four foliar applications of the test substance at a rate of approximately 0.28 kg ai/ha each, for a total of approximately 1.12 kg ai/ha. Samples were collected approximately 3 days after the final application.

Table 10: Residues in/on strawberry treated with methoxyfenozide in supervised trials in the USA in 2000–2001 (IR-4 Study No.06768)

Location, Variety	Application			Total/ season, kg ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	kg ai/ha	No	Interval days					
GAP, USA Strawberries	0.1–0.21		14	1.12	3			
Apply in a minimum of 94 and 188 L/ha to provide full foliar coverage								
Salinas, CA; Selva	0.28	4	13–15	1.12	0	0.44	0.44	CA-02
					3	0.38	0.43	
					6	0.27	0.38	
					13	0.12	0.15	
Lyons, GA; Candler	0.28	5	13–15	1.4	2	0.16	0.21	GA02
Live Oak, FL; Florida 93100	0.27–0.28	4	14	1.12	2	0.38	0.49	FL04
Upper Deerfield, NJ; Midway	0-27–0.28	4	11–14	1.12	4	0.22	0.24	NJ02
Wilsonville, OR; Totem	0.28–0.29	4	14–18	1.12	3	0.15	0.20	OR23
Madera, CA; Hecker	0.28	4	14–15	1.12	3	1.02	1.15	CA130
Chowchilla, CA; Hecker	0.28–0.37	4	14–15	1.12	3	0.35	0.60	CA131
Wooster, OH; Mohawk	0.27–0.29	4	12–13	1.12	3	0.12	0.18	OH01

Assorted tropical and subtropical fruits - inedible peel

Avocado

Six field trials were conducted during the 2004 and 2005 growing seasons in Texas, Florida, and four in California. The adjuvant Latron® B-1956 was added to the spray mixtures. The foliar applications were made 6 to 8 days apart and timed so that mature avocados could be harvested 2 to 4 days after the final application.

Table 11 Residues in/on avocado treated with methoxyfenozide in supervised trials in the USA in 2004–2005(IR-4 Study No.07060)

Location, Variety, year	Application			Total/ season, kg ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	kg ai/ha	No	Interval days					
GAP, USA Avocado	0.1–0.18	5	6	1.12	2			
Apply in a minimum of 470 L/ha or more to provide full foliar coverage								
Monte Alto, TX; Lula	0.28	4	6–7	1.13	2	0.16	0.14	04-TX26
Homestead, FL; Perterson	0.29–0.30	4	7–8	1.19	3	0.06	0.03	04-FL29
Orosi, CA; Hass [a]	0.28	4	7–8	1.12	2	0.08	0.09	04-CA81
Orosi, CA; Hass [a]	0.28	4	6–8	1.12	2	0.14	0.14	04-CA82
Irvine, CA; Hass	0.28	4	6–7	1.12	2	0.09	0.13	04-CA83
Irvine, CA; Hass	0.28	4	6–7	1.12	4	0.41	0.30	04-CA84

[a] The trials were conducted at the same site with the 1st treatment 9 days apart, thus they were not independent.

Papaya

Field trials were conducted in Florida (3) and one in Hawaii. Each treated plot received four foliar applications of the test substance at a rate of approximately 0.28 kg ai/ha each, for a total of approximately 1.12 kg ai/ha. Latron B-1956 was included in the tank mixes at the Hawaii trial. All applications were made 10 to 11 days apart, and commercially mature papayas were collected 3 to 4 days following the final application. The trials FL30 and FL 32 in Florida were performed at the same site with a few days difference in application dates.

Table 12 Residues in/on papaya treated with methoxyfenozide in supervised trials in the USA in 2001 (IR-4 Study No.07063)

Location, Variety	Application			Total/ season, kg ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	kg ai/ha	No	Interval days					
GAP, USA Papaya	0.21–0.28	5	10	1.12	3			
Apply in a minimum of 470 L/ha or more to provide full foliar coverage								
Homestead, FL; EXP-15 [a]	0.28–0.30	4	10	1.13	4	0.078	0.17	01-FL30
Homestead, FL; EXP-15	0.28–0.29	4	10–11	1.13	3	0.167	0.31	01-FL31
Homestead, FL; EXP-15 [a]	0.25–0.29	4	10–11	1.12	3	0.12	0.18	01-FL32
Waialua, HI; Rainbow	0.28–29	4	10–11	1.12	3	0.29	0.33	01-HI09

[a] The trials were conducted at the same site with 1st application 4 days apart, thus the trials were not independent.

Fruiting vegetables, Cucurbits

Cantaloupe

Seven field trials were conducted in Georgia, South Carolina, Texas, Ohio, and California (three trials). Each treated plot received four foliar applications of the test substance at a rate of approximately 0.28 kg ai/ha each, for a total of approximately 1.12 kg ai/ha. All applications were made 6 to 8 days apart, and marketable melons were collected 2 to 3 days following the final application.

Table 13 Residues in/on cantaloupe treated with methoxyfenozide in supervised trials in the USA in 1999 (IR-4 Study No.07195)

Variety Form	Application			Total/ season, kg ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	kg ai/ha	No	Interval days					
GAP, USA cucurbits	0.067–0.18	4	7	1.12	3			
Apply in a minimum of 94 L/ha spray or more to provide full foliar coverage								
Tifton, GA; Cordele	0.28–29	4	6–7	1.22	3	0.13	0.16	99-GA17
Charleston, SC; Touchdown	0.27			0.96	3	0.050	0.091	99-SC*05
Weslaco, TX; Hy Mark	0.27–0.29	4	6	1.03	2	0.15	0.26	99- TX16
Fremont, OH; Eclipse	0.27–0.3	4	7	1.02	2	0.19	0.13	99-OH13
Holtville, CA; Hy Mark [a]	0.27–029	4	7	0.99	3	0.067	0.15	99-CA48
Holtville, CA; Mission [a]	0.28	4	7	1.0	2	0.16	0.21	99-CA49
Huron, CA; Hy Mark F1	0.28-0.29	4		1.0	3	0.11	0.14	99-CA124

[a] The trials were conducted at the same site during the same period using different varieties/cultivars

Cucumber

Eight field trials were conducted in Maryland, Georgia, South Carolina, Florida, Texas, Ohio, Wisconsin and California. Each treated plot received four foliar applications of the test substance at a rate of approximately 0.28 kg ai/ha each, for a total of approximately 1.12 kg ai/ha. All applications were made 6 to 8 days apart, and mature cucumbers were collected 2 to 3 days following the final application.

Table 14 Residues in/on cucumber treated with methoxyfenozide in supervised trials in the USA in 1999 (IR-4 Study No.07016)

Location, Variety	Application			Total/ season, kg ai/ha	PHI days	Residue, mg/kg		Trial Id.
	kg ai/ha	No	Interval days					
GAP, USA cucurbits	0.067–0.18	4	7	1.12	3			
Apply in a minimum of 94 L/ha spray or more to provide full foliar coverage								
Salisbury, MD; Regal pickling	0.28–0.29	4	6–7	1.12	2	0.031	0.034	MD02
Tifton, GA; Thunder slicing	0.29	4	6–8	1.12	2	0.049	0.054	GA18
Charleston, SC; Regal pickling	0.27–0.37	4	7	1.12	2	< 0.01	0.011	SC*04
Gainesville, FL Dasher II slicing	0.29–0.30	4	7	1.18	3	0.016	0.080	FL24
Weslaco, TX; Calypso pickling	0.27–0.29	4	6–7	1.12	3	0.032	0.068	TX15
Fremont, OH; FMX5020 pickling	0.27–0.3	4	6–8	1.12	3	0.033		OH14
Arlington, WI; Fanfare slicing	0.28–0.29	4	6–7	1.12	3	0.018	0.019	WI12
Holtville, CA; Conquistador slicing	0.27–0.28	4	7	1.12	3	0.021	0.031	CA47

Squash, summer

Six field trials were conducted in New Jersey, South Carolina, Georgia, Florida, Ohio, and California. Each treated plot received four foliar applications of the test substance at a rate of approximately 0.28 kg ai/ha each, for a total of approximately 1.12 kg ai/ha. All applications were made 6 to 8 days apart, and mature summer squash was collected 2 to 3 days following the final application.

Table 15: Residues in/on squash treated with methoxyfenozide in supervised trials in the USA in 1999 (IR-4 Study No.07194)

Location, Variety	Application			Total/ season, kg ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	kg ai/ha	No	Interval days					
GAP, USA cucurbits	0.067–0.18	4	7	1.12	3			
Apply in a minimum of 94 L/ha spray or more to provide full foliar coverage								
Deerfield, NJ; Yellow Lemon Drop	0.26–0.28	4	6–7	1.12	2	0.082	0.096	99-NJ15
Charleston, SC; Early Prolific	0.27–0.28	4	7–8	1.09	3	< 0.010	< 0.01	99-SC* 03
Tifton, GA; Prelude	0.28–0.29	4	6–8	1.19	2	0.094	0.11	99-GA* 09
Gainesville, FL; Enterprise	0.28–0.29	4	7	1.13	3	0.014	0.014	99-FL23
Fremont, OH; Ambassador	0.28–0.30	4	6–8	1.13	2	0.033	0.034	99-OH*08
Holtville, CA; Enterprise summer	0.27–0.28	4	7	1.11	3	0.15	0.16	99-CA46

Legume vegetables (beans, peas)

Common bean (pods and/or immature seeds)

Eight field trials were conducted in Georgia, Ohio, Washington, California, New York, Florida, Wisconsin, and Indiana. Each treated plot received four foliar applications of the test substance at a rate of approximately 0.28 kg ai/ha each, for a total of approximately 1.12 kg ai/ha. All applications were made 6 to 8 days apart, and edible podded beans and bean foliage were collected 6 to 8 days following the final application.

Table 16 Residues in/on succulent beans in pod treated with methoxyfenozide in supervised trials in the USA in 2000 (IR-4 Study No.07532)

Variety Form	Application			Total/ season, g ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	g ai/ha	No	Interval days					
GAP, USA legume vegetables (succulent)	0.18–0.28	4	7–14	1.12	7			
Apply in a minimum of 94 L/ha spray or more to provide full foliar coverage								
Tifton, GA; Bronco garden	0.28	4	6–8	1.13	8	0.52	0.62	00-GA* 17
Fremont, OH; Strike bean	0.27–0.3	4	7–8	1.14	8	< 0.05	< 0.05	00-OH*14
Moxee, WA; Jade bean	0.28	4	6–8	1.13	6	< 0.05	< 0.05	00-WA* 15
Porterville, CA; Kentucky Wonder 125 bush bean	0.28	4	7	1.12	7	0.63	0.99	00-CA141
Freeville, NY; Labrador snap beans	0.27–0.28	4	7	1.11	8	< 0.05	< 0.05	01-NY18
Gainesville, FL; Blue Lake snap beans	0.29–0.3	4	7	1.17	7	0.063	0.079	01-FL33

Beans, shelled

Seven field trials were conducted in Georgia, Ohio, California, Maryland (two trials), North Carolina, and Idaho. Each treated plot received at least four foliar applications of the test substance at a rate of approximately 0.28 kg ai/ha each, for a total of approximately 1.12 kg ai/ha. At the Georgia and Idaho trials, a fifth application was made to allow the beans to mature for a total of approximately 1.25 kg ai/ha. All applications were made 6 to 8 days apart, and succulent beans were collected 6 to 7 days following the final application and shelled.

Table 17 Residues in/on succulent beans (shelled) treated with methoxyfenozide in supervised trials in the USA in 2000 -2001 (IR-4 Study No.07531)

Variety Form	Application			Total/ season, kg ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	kg ai/ha	No	Interval days					
GAP, USA legume vegetables (succulent)	0.18–0.28	4	7–14	1.12	7			
Apply in a minimum of 93 L/ha spray or more to provide full foliar coverage								
Tifton, GA; Cangreen lima bean	0.28–0.29	5 [a]	7–8	1.42	7	< 0.05	< 0.05	00-GA*18
Fremont, OH; Handerson lima bean	0.27–0.29	4	7–8	1.13	6	< 0.05	0.086	00-OH* 15
Parlier, CA; Henderson Baby Bush lima bean	0.29–0.3	4	6–7	1.18	7	< 0.05	< 0.05	00-CA162
Salisbury, MD; Eastland lima bean [b]	0.28	4	7–8	1.13	7	< 0.05	< 0.05	01-MD12

Variety Form	Application			Total/ season, kg ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	kg ai/ha	No	Interval days					
Salisbury, MD; Green Baby lima bean [b]	0.28	4	7–8	1.13	7	< 0.05	0.052	01-MD13
Clinton, NC; Fordhook lima bean	0.28	4	7	1.12	7	< 0.05	< 0.05	01-NC16
Kimberly, ID; Henderson lima bean	0.28	5 [a]	7–8	1.13	6	0.13	0.14	01-ID12

[a] A fifth application was made to allow beans to mature.

[b] The trials were conducted at the same site using different varieties.

Garden peas, shelled (succulent seeds)

Eight field trials were conducted in New Jersey, Washington, California, Wisconsin (two trials), and Ohio (two trials). Each treated plot received four foliar applications of the test substance at a rate of approximately 0.28 kg ai/ha each, for a total of approximately 1.12 kg ai/ha. All applications were made 6 to 8 days apart, and succulent shelled peas were collected 6 to 8 days following the final application. The trials in Ohio were performed at the same site with 2 weeks apart.

Table 18 Residues in/on succulent peas (shelled) treated with methoxyfenozide in supervised trials in the USA in 2000–2001 (IR-4 Study No.07528)

Location Variety	Application			Total/ season, kg ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	kg ai/ha	No	Interval days					
GAP, USA legume vegetables (succulent)	0.18–0.28	4	7–14	1.12	7			
Apply in a minimum of 94 L/ha spray or more to provide full foliar coverage								
Bridgeton, NJ; Bolero pea	0.27–0.28	4	6–7	1.11	7	< 0.05	0.14	00-NJ23
Moxee, WA; Oregon Trail pea	0.27–0.29	4	6–8	1.12	7	< 0.05	< 0.05	00-WA* 18
Visalia, CA; Cascadia pea	0.28	4	7	1.12	7	0.092	0.18	00-CA128
Arlington, WI; Gallant pea [a]	0.28	4	6	1.13	6	< 0.05	0.058	01-WI14
Arlington, WI; Dual pea [a]	0.28	4	6	1.13	6	< 0.05	0.12	01-WI15
Fremont, OH; Bolero pea [b]	0.28–0.29	4	6–8	1.15	8	< 0.05	< 0.05	01-OH* 16
Fremont, OH; Bolero pea [b]	0.27–0.3	4	6–8	1.13	6	< 0.05	< 0.05	01-OH*17
Moxee, WA; Progress No. 9 pea	0.28–0.29	4	7	1.13	8	< 0.05	< 0.05	01-WA* 26

[a] Trials were conducted at one site during the same period using different varieties.

[b] Trials were conducted at one site at about 2 weeks apart, thus they were not considered independent.

Pulses

Beans (dry)

During the 2002 growing season thirteen field trials were conducted in New York, Nebraska (three), North Dakota (two), Colorado (two), Washington, California, and North Dakota (three). The foliar applications were made 6 to 8 days apart and timed so that commercially mature dry beans could be harvested 6 to 8 days after the final application.

At the New York, Nebraska, Washington, and 02-ND12 and 02-ND13 North Dakota trials, the plants were left to dry for 7 to 14 days. At the remaining trials, duplicate samples of dry beans were collected at harvest.

Table 19 Residues in/on dry beans treated with methoxyfenozide in supervised trials in the USA in 2002 (IR-4 Study No. 07530)

Variety Form	Application			Total/ season, g ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	g ai/ha	No	Interval days					
GAP, USA dry beans	0.18–0.28	4	7–14	1.12	7			
Apply in a minimum of 94 L/ha spray or more to provide full foliar coverage								
Freeville, California early light red kidney	0.27–0.28	4	7	1.11	7	< 0.05	< 0.05	02-NY23
Scottsbluff, NE; Marquis	0.26–0.28	4	6–7	1.09	8	< 0.05	< 0.05	02-NE01
Scottsbluff, NE; Marquis [a]	0.27–0.28	4	6–7	1.10	8	< 0.05	< 0.05	02-NE02
Scottsbluff, NE; Marquis [a]	0.26–0.28	4	6–7	1.09	8	< 0.05	< 0.05	02-NE03
Carrington, ND; Maverick [b]	0.29	4	6–8	1.15	8	< 0.05	< 0.05	02-ND12
Carrington, ND; Maverick [b]	0.29–0.3	4	6–8	1.16	8	< 0.05	< 0.05	02-ND13
Fort Collins, CO; Chase pinto	0.27–0.29	4	7	1.11	8	< 0.05	< 0.05	02-CO13
Fort Collins, CO; Othello pinto	0.27–0.28	4	7	1.10	7	< 0.05	< 0.05	02-CO14
Moxee, WA; WA Othello	0.27–028	4	7–8	1.11	6	< 0.05	< 0.05	02-WA* 41
Salinas, CA; Small white	0.29	4	7	1.16	6	0.076	0.22	02-CA* 115
Velva, ND; Maverick pinto [c]	0.28–0.29	4	6–8	1.13	7	< 0.05	< 0.05	02-ND19
Velva, ND; Othello pinto [c]	0.28	4	6–8	1.13	7	< 0.05	< 0.05	02-ND20
Velva, ND; Maverick pinto [c]	0.28–0.29	4	6–8	1.12	7	< 0.05	< 0.05	02-ND21

[a] Trials were conducted at the same site on different soil types and using different irrigation types (furrow irrigation was used at the NE02 trial and overhead irrigation at the NE03 trial).

[b] Trials were conducted at the same site. The treated fields were about 400 m apart. Overhead irrigation was used throughout the ND-12 trial whereas, at the ND13 trial, no irrigation was made during the trial.

[c] Trials were conducted at the same site using two different varieties.

Cowpea (dry)

Six field trials were conducted in Tennessee, Georgia, South Carolina, North Carolina, and California. Each treated plot received four foliar applications of the test substance at a rate of approximately 0.28 kg ai/ha each, for a total of approximately 1.12 kg ai/ha. All applications were made 6 to 8 days apart, and commercially mature cowpeas (black-eyed peas) in pods were harvested 7 to 8 days following the final application. The peas were dried for up to 11 days and shelled.

Table 20 Residues in/on dry black eyed pea treated with methoxyfenozide in supervised trials in the USA in 1999 (IR-4 Study No. 07018)

Location, Variety	Application			Total/ season, kg ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	kg ai/ha	No	Interval days					
GAP, USA dry beans	0.18–0.28	4	7-14	1.12	7			
Apply in a minimum of 94 L/ha spray or more to provide full foliar coverage								
Crossville, TN; Purple Hull Pinkeye Southern peas [a]	0.28	4	6–7	1.12	7	0.098	0.16	99-TN04

Location, Variety	Application			Total/ season, kg ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	kg ai/ha	No	Interval days					
Crossville, TN; Purple Hull Pinkeye Southern peas [a]	0.28–0.29	4	7–8	1.13	8	0.53	0.67	99-TN05
Tifton, GA; California Blackeye #5 p.	0.27	4	6–7	1.08	8	0.50	0.56	99-GA* 16
Charleston, SC; California Blackey #5 p.	0.28–0.29	4	7	1.11	7	0.14	0.17	99-SC* 06
Clinton, NC; Dixie Lee peas	0.28–0.31	4	6–8	1.22	8	0.10	0.13	99-NC08
Parlier, CA; CB-46 Blackeye peas	0.27–0.28	4	6–8	1.10	8	2.0	3.4	99-CA50

[a] Trials were conducted at the same site approximately 20 days apart. The two trials were impacted by weather conditions (hard rain and hail) at different stages/application events (TN04 shortly after the 4th application and TN05 shortly after the 1st application). These trials were not considered independent.

Soya bean (dry)

Methoxyfenozide was applied four times to soya beans in RAC, bridging and decline trials. The plots were treated at 0.28 kg ai/ha at about 7 days apart. The 2F formulation was also applied at a rate of 1.4 kg ai/ha to soya beans in a processing trial. Methoxyfenozide in an 80WP formulation was also applied four to five times at a rate of 0.28 kg ai/ha in the bridging trials.

Two plots were treated at one site, one for providing residue data for forage and hay and another for seed only. There was a minimum of 33 m between treated and untreated plots and a minimum of 18 m between treated plots in RAC and bridging trials, and 33 m between treated plots in the decline trials. Plots in the processing trial were large enough to obtain about 450 kg samples.

For the RAC, bridging and processing trials, forage samples were collected at 7 ± 1 days following the first application. Hay samples were collected 7 ± 1 days after the last (4th) application. Seed samples were collected 14 ±1 days after the last (4th) application.

Hay samples were allowed to dry to a moisture content of 10 to 20% (exception at trials 21801058, 21801064 where the moisture content of the hay samples was not determined).

For the decline trials, forage was collected at 0, 7, 14 and 21 days after the first application of the 2F formulation. Hay samples were collected at 0, 7, 14, and 21 days after the last (4th) application of the 2F formulation. Seed samples were harvested at 0, 7, 14-15 and 21-22 days after the last (4th) application.

The harvested crop soya bean matrices were analysed for the parent compound (methoxyfenozide), the hydroxy-methoxyfenozide metabolite and the total sugar conjugates of methoxyfenozide (glucose and malonyl) determined as the glucose conjugate (indicated as G-Methoxyfenozide).

Table 21 Residues in soya bean seed treated with methoxyfenozide in supervised trials in the USA in 2001 (Report No.34-01-07)

Location, (Variety) Trial number	Application			Total/ season kg ai/ha	PHI, days	Residue, mg/kg		
	Form	kg ai/ha	No			Methoxy-fenozide	OH-Methoxy-fenozide	G-Methoxy-fenozide
GAP, USA Soya bean		0.0670.135	4	1.12	7			
Apply in a minimum of 93 L/ha spray or more to provide full foliar coverage								
Athens, GA, Hutcheson 21801052	2F	0.28	4	1.12	14	1.0 1.2	< 0.02, < 0.02	< 0.05, < 0.05

Location, (Variety) Trial number	Application			Total/ season kg ai/ha	PHI, days	Residue, mg/kg		
	Form	kg ai/ha	No			Methoxy-fenozide	OH-Methoxy-fenozide	G-Methoxy-fenozide
Chula, GA, Hartz H7550 RR 21801053	2F	0.28	4	1.12	14	0.20 0.22	< 0.02 < 0.02	< 0.05, < 0.05
Proctor, AR, AG 4902 21801054	2F	0.28	4	1.12	15	0.14 0.098	< 0.02 < 0.02	< 0.05 < 0.05
Washington, LA, DP 5915 RR 21801055	2F	0.28	4	1.12	14	0.041 0.070	< 0.02 < 0.02	< 0.05 < 0.05
Greenville, MS, Ashgrow 4702 21801056	2F	0.28	4	1.12	14	0.38 0.45	< 0.02 < 0.02	< 0.05 (0.0176)
	80WP	0.28	4	1.12	14	0.46 0.70 0.65	< 0.02	< 0.05
Geneva, MN, Ashgrow 2201 21801057	2F	0.28	4	1.12	14	< 0.02 0.033	< 0.02 < 0.02	< 0.05 < 0.05
Richland, IA, Pioneer 93 BO1 21801058	2F	0.28	4	1.12	14	0.057 0.046	< 0.02 < 0.02	< 0.05 < 0.05
Wichita, KS, NC+ 3A87, 21801059	2F	0.28	4	1.12	15	0.11 0.10	< 0.02 < 0.02	< 0.05 < 0.05
Britton, SD SD 109IRR, 21801060	2F	0.28	4	1.12	15	0.033 0.024	< 0.02 < 0.02	< 0.05 < 0.05
Marysville, OH, C-9284 RR, 21801061	2F	0.28	4	1.12	14	0.073 0.069	< 0.02 < 0.02	< 0.05 < 0.05
Sparta, IL, 6443 NRR, 21801062	2F	0.28	4	1.12	14	0.092 0.088	< 0.02 < 0.02	< 0.05 < 0.05
York, NE, NE 2596 21801064	2F	0.28	4	1.12	14	0.052 (0.0194)	< 0.02 < 0.02	< 0.05 < 0.05
	80WP	0.28	4	1.12	14	< 0.02 0.030 0.031	< 0.02 < 0.02 < 0.02	< 0.05 < 0.05 < 0.05
Campbell, MN, DKB 06-51 (Roundup Ready) 21801065	2F	0.28	4	1.12	14	0.040 0.044 0.040	< 0.02 < 0.02 < 0.02	< 0.05 < 0.05 < 0.05
	80WP	0.28	4	1.12	14	0.040 0.038	< 0.02 < 0.02	< 0.05 < 0.05
Carlyle, IL H3371 CR 21801066	2F	0.28	4	1.12	0	0.29 0.30	< 0.02 < 0.02	< 0.05 < 0.05
					7	0.16 0.16	< 0.02 < 0.02	< 0.05 < 0.05
					15	0.10 0.022	< 0.02 < 0.02	< 0.05 < 0.05
					22	0.021 0.024 0.027	< 0.02 < 0.02	< 0.05 < 0.05

Location, (Variety) Trial number	Application			Total/ season kg ai/ha	PHI, days	Residue, mg/kg		
	Form	kg ai/ha	No			Methoxy-fenozide	OH-Methoxy-fenozide	G-Methoxy-fenozide
Arkansaw, WI Ashgrow AG0801 21801067					0	0.12 0.16	< 0.02 < 0.02	< 0.05 < 0.05
					7	0.027 0.042	< 0.02 < 0.02	< 0.05 < 0.05
					14	0.026 0.024	< 0.02 < 0.02	< 0.05 < 0.05
					21	< 0.02 < 0.02	< 0.02 < 0.02	< 0.05 < 0.05

Root and tuber vegetables

Carrot

Seven field trials were conducted in Georgia, Texas, Ohio, California (two trials), Oregon, and Florida. Each treated plot received at least four foliar applications of the test substance at a rate of approximately 0.28 kg ai/ha each, for a total of approximately 1.12 kg ai/ha. At the 2000 California trial, a fifth application was made to allow the carrots to mature for a total of approximately 1.40 kg ai/ha. All applications were made 12 to 15 days apart, and mature carrots were collected 12 to 15 days following the final application.

Table 22 Residues in/on carrot treated with 80WP formulation of methoxyfenozide in supervised trials in the USA in 2000 (IR-4 Study No.07520)

Location, Variety	Application			Total/ season, kg ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	kg ai/ha	No	Interval days					
GAP, USA root vegetables	0.10–0.28		14	1.12	14			
Apply in a minimum of 94 L/ha spray or more to provide full foliar coverage								
Tifton, GA, XP 3918 Hybrid carrot	0.28	4	13–15	1.14	14	0.24	0.31	00-GA*08
Weslaco, TX Imperator 58	0.28	4	13–15	1.12	14	0.12	0.13	00-TX*22
Celeryville, OH Apache carrot	0.27–0.28	4	13–15	1.13	12	< 0.05	< 0.05	00-OH*07
El Centro, CA, Caro Pak carrot	0.27–0.28	5 [a]	13–15	1.11	15	0.14	0.14	00-CA82
Aurora, OR, Red-cored Chantenay carrot	0.28–0.29	4	12–14	1.14	12	0.084		00-OR22
Live Oak, FL Navajo F-1 carrot	0.28–029	4	12–15	1.14	14	< 0.050	0.057	00-FL74
Parlier, CA, Danvers Half Long 126 carrots	0.28–0.30	4	14	1.17	14	0.14	0.16	01-CA118

[a] A fifth application was made to allow the carrots to mature

Radish

Five field trials were conducted in New York, Florida (two trials), Ohio, and California. Each treated plot received two foliar applications of the test substance at a rate of approximately 0.28 kg ai/ha each, for a total of approximately 0.56 kg ai/ha. All applications were made 13 to 15 days apart, and

mature radish tops and roots were collected 13 to 15 days following the final application. The trials in Florida FL-46, FL47) were performed at the same site with a few days apart.

Table 23 Residues in/on radish treated with 80WP formulation of methoxyfenozide in supervised trials in the USA in 2000 (IR-4 Study No.07521)

Location, Variety	Application			Total/ season, kg ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	kg ai/ha	No	Interval days					
GAP, USA root vegetables	0.10–0.28		14	1.12	14			
Apply in a minimum of 94 L/ha spray or more to provide full foliar coverage								
Freeville, NY, Vintage radish, tops	0.28	2	13	0.56	14	0.32	0.34	00-NY16
Vintage radish, root	0.28		13	0.56	14	< 0.05		
Gainesville, FL Cabernet radish, tops	0.28	2	14	0.56	13	1.7	1.8	00-FL46
Cabernet radish, root	0.28	2	14	0.56	13	0.10		
Gainesville, FL Cabernet radish, tops	0.29	2	14	0.58	14	0.51	0.75	00-FL47
Cabernet radish, root	0.29	2	14	0.58	14	0.07	0.08	
Celeryville, OH SRA 3505 radish, tops	0.28	2	15	0.56	15	0.30	0.33	00-OH13
SRA 3505 radish, root	0.28	2	15	0.56	15	< 0.05		
Parlier, CA White Icicle radish, tops	0.29–0.30	2	13	0.57	13	3.2	4.0	00-CA88
White Icicle radish, root	0.29–0.30		13	0.57	15	0.10–	0.12	

Sugar beet

Eleven field trials conducted in North Dakota (four trials), Wisconsin (two trials), California (two trials), Ohio, Washington, and Colorado. Each treated plot received four foliar applications of the test substance at a rate of approximately 0.28 kg ai/ha each, for a total of approximately 1.12 kg ai/ha. All applications were made 12 to 16 days apart, and commercially mature sugar beet roots and tops were collected 6 to 8 days following the final application. At the 00-ND05 trial, additional roots were collected for processing into refined sugar, dried pulp, and molasses.

Table 24 Residues in/on sugar beet roots treated with 2F formulation of methoxyfenozide in supervised trials in the USA in 2000–2001 (IR-4 Study No.07522)

Location, Variety	Application			Total/ season, g ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	g ai/ha	No	Interval days					
GAP, USA root vegetables	0.10–0.28		14	1.12	7			
Apply in a minimum of 94 L/ha spray or more to provide full foliar coverage								
Fargo, ND Hilleshog Blazer,	0.29–0.30	4	13–16	1.17	7	0.08	0.085	00-ND05
Roots for processing						0.14		
Refined sugar						< 0.01		
Dried pulp						0.12		
Molasses						0.16		
Fargo, ND Hilleshog Blazer	0.28–0.29	4	13–14	1.16	6	0.093	0.17	00-ND06
Arlington, WI Beta 2084	0.28–0.29	4	12	1.14	6	0.13	0.18	00-WI07
Madera, CA, NB7R sugar beet	0.28	4	14	1.12	7	< 0.050	0.092	00-CA106
Fargo, ND Crystal 817 sugar beet	0.28–0.29	4	14	1.14	7	0.11	0.13	01-ND08

Location, Variety	Application			Total/ season, g ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	g ai/ha	No	Interval days					
Fargo, ND Crystal 817 sugar beet roots	0.28–0.29	4	14–15	1.14	6	0.11	0.14	01-ND09
Arlington, WI Beta 2084, sugar beet roots	0.28	4	12	1.12	6	0.057	0.11	01-WI16
Fremont, OH Michigan Crystal 64R	0.28–0.29	4	14	1.12	8	< 0.05		01-OH*18
Salinas, CA B4776R r sugar beet roots	0.28–0.29	4	14–16	1.14	8	< 0.05		01-CA*62
Moxee, WA Oasis sugar beet roots	0.28–0.29	4	13–15	1.14	8	< 0.05		00-WA*27
Fort Collins, CO 1640, Medium sugar beet roots	0.28	4	14	1.12	7	0.058	0.066	01-CO13

Sweet potato

Nine field trials were conducted for this study during the 2003 growing season in Maryland, New Jersey, Florida (Region 3), North Carolina (two), Texas, South Carolina, and California. At each trial, three foliar applications were made at a rate of approximately 0.18 kg ai/ha each for a total of approximately 0.56 kg ai/ha. No adjuvant was added to the spray mixtures. The foliar applications were generally made 13 to 15 days apart and timed so that commercially mature sweet potatoes could be harvested six to eight days after the final application.

Table 25 Residues in/on sweet potato treated with 2F formulation of methoxyfenozide in supervised trials in the USA in 2003 (IR-4 PR No. 08505)

Location, Variety	Application			Total/ season, g ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	g ai/ha	No	Interval days					
GAP, USA tuber and corm vegetables	0.10–0.18	3	14	1.12	7			
Apply in a minimum of 94 L/ha spray or more to provide full foliar coverage								
Salisbury, MD Red Darby	0.18–0.19	3	13–16	0.56	8	< 0.01		03-MD14
Bridgeton, NJ Beauregard	0.18	3	14	0.53	7	0.012	< 0.01	03-NJ31
Citra, FL Georgia Red	0.18	3	13–15	0.56	7	< 0.01		03-FL53
Clinton, NC [a] Beauregard	0.18	3	14–15	0.53	8	< 0.01		03-NC25
Weslaco, TX Beauregard	0.18	3	14–15	0.56	6	< 0.01		03-TX*36
Crossville, TN Puerto Rico	0.19–0.22	3	14–15	0.60	7	< 0.01		03-TN07
Clinton, NC Jewel	0.18	3	15,12	0.53	7	< 0.01		03-NC26
Charleston, SC	0.18	3	13	0.55	8	< 0.01		03-SC*07
Madera, CA	0.18	3	14	0.54	7	< 0.01		03-CA113

[a] The trials were conducted at the same site approximately 3 weeks apart using different varieties.

Residues between LOD and LOQ ranged 0.0035–0.0083 mg/kg

Peanut

Supervised field trials on peanut were conducted in Maryland, Colorado, Georgia (4 trials), North Carolina (4 trials), and Texas (2 trials). Three applications of methoxyfenozide were scheduled at each field site with a total seasonal targeted application rate of 0.54 kg ai/ha. Four applications were made at the Tifton, Georgia trials sites to ensure crop maturity at the appropriate PHI. Peanut nut and hay samples were collected at a 6 to 8 day PHI. At one of the Texas field trial sites, an additional treatment was also included at a 3× rate for the collection of nut samples for processing into meal and refined oil.

Table 26 Residues in peanut meat treated with 2F formulation of methoxyfenozide in supervised trials in the USA in 2003 (IR-4 PR No. 08115)

Location Variety	Application			Total/ season, g ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	g ai/ha	No	Interval days					
GAP, USA peanut	0.10–0.18	3	7	1.12	7			
Apply in a minimum of 94 L/ha spray or more to provide full foliar coverage								
Salisbury, VA-C98R	0.18	3	8	0.493	7	< 0.01	0.0033 [b]	03-MD05
Rocky Ford, 458	0.18	3	7	0.497	6	0.0044 [b]	0.0055 [b]	03-CO10
Tifton, Perry [c]	0.18	4	21 [a],8,6	0.641	8	< 0.01	< 0.01	03-GA*06
Tifton, PG D.P.1 [c]	0.18	4	21 [a],8,6	0.641	8	< 0.01	< 0.01	03-GA*07
Tifton, C99R [c]	0.18	4	21 [a],8,6	0.64	8	< 0.01	< 0.01	03-GA*08
Tifton, GA 02C [c]	0.18	4	21 [a],8,6	0.64	8	< 0.01	< 0.01	03-GA*09
Rocky Mount, Gregory [d]	0.18	3	7	0.482	7	0.0061 [b]	0.0052 [b]	03-NC03
Rocky Mount, Perry [d]	0.18	3	7	0.482	7	0.0036 [b]	0.0044 [b]	03-NC04
Rocky Mount, NC 11 [d]	0.18	3	7	0.481	7	0.004 [b]	0.0084 [b]	03-NC05
Rocky Mount, NC12 [d]	0.18	3	7	0.483	7	0.016	0.011	03-NC06
Weslaco, Tamrun 96 [e]	0.18	3	6	0.48	7	< 0.01	< 0.01	03-TX11
Weslaco, Tamrun 96 [e]	0.18	3	6	0.492	6	< 0.01	< 0.01	03-TX12
Weslaco, Tamrun 96 [f]	0.54	3	6	1.463				03-TX12

[a] Between 1st and 2nd application, the 4th treatment was near maturity

[b] Residue values between LD and LOQ.; < 0.01 indicate samples without detectable residues.

[c] Trials were conducted at the same site during the same time, treatments were made with the same equipment. Different varieties were used in each trial.

[d] Trials were conducted at the same site during the same time, treatments were made with the same equipment. Different varieties were used in each trial.

[e] Trials were conducted at the same site during the same time, treatments were made with the same equipment.

[f] The trial was conducted at about 3X rate to obtain peanut meat for processing

Animal feed

The trial conditions are described under the food commodities.

Table 27 Residues in/on bean foliage treated with methoxyfenozide in supervised trials in the USA in 2000 (IR-4 Study No.07532)

Variety Form	Application			Total/ season, g ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	g ai/ha	No	Interval days					
GAP, USA legume vegetables (succulent)	0.18–0.28	4	7–14	1.12	7			
Apply in a minimum of 94 L/ha spray or more to provide full foliar coverage								
Bronco garden, foliage	0.28	4	6–8	1.13	8	20	32	00-GA*17
Strike bean, foliage	0.27–0.3	4	7–8	1.14	8	4.9	5.3	00-OH*14
Jade bean, foliage	0.28	4	6–8	1.13	6	3.1	3.4	00-WA*15

Variety Form	Application			Total/ season, g ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	g ai/ha	No	Interval days					
Kentucky Wonder 125 bush bean, foliage	0.28	4	7	1.12	7	13	16	00-CA141
Labrador snap beans, foliage	0.27–0.28	4	7	1.11	8	5.0	6.6	01-NY18
Blue Lake snap beans, foliage		4	7		7	3.5	4.6	01-FL33

Table 28 Residues in/on sugar beet tops treated with 2F formulation of methoxyfenozide in supervised trials in the USA in 2000–2001 (IR-4 Study No.07522)

Location, Variety, plant part	Application			Total/ season, g ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	g ai/ha	No	Interval days					
GAP, USA cucurbits	0.10–0.28		14	1.12	7			
Apply in a minimum of 93 L/ha spray or more to provide full foliar coverage								
Fargo, ND Hilleshog Blazer , tops	0.29–0.30	4	13–16	1.17	7	1.7	1.9	
Fargo, ND Hilleshog Blazer, tops	0.28–0.29	4	13–14	1.16	6	2.1	3.3	
Arlington, WI Beta 2084 tops	0.28–0.29	4	12	1.14	6	3.1	3.6	
Madera, CA NB7R sugar beet tops	0.28	4	14	1.12	7	8.6	10	00-CA106
Fargo, ND Crystal 817 tops	0.28–0.29	4	14	1.14	7	3.1	4.9	01-ND08
Fargo, ND Crystal 817 sugar tops	0.28–0.29	4	14–15	1.14	6	4.7	3.7	01-ND09
Arlington, WI Beta 2084, tops	0.28	4	12	1.12	6	0.40	0.85	01-WI16
Fremont, OH Michigan Crystal 64R tops	0.28–0.29	4	14	1.12	8	0.40	0.85	01-OH*18
Salinas, CA B4776R tops	0.28–0.29	4	14–16	1.14	8	2.2	2.6	01-CA*62
Moxee, WA Oasis sugar tops	0.28–0.29	4	13–15	1.14	8	2.9	3.8	00-WA*27
Fort Collins, CO 1640, Medium tops	0.28	4	14	1.12	7	8.9	9.5	01-CO13

Table 29 Residues in peanut hay treated with 2F formulation of methoxyfenozide in supervised trials in the USA in 2003 (IR-4 PR No. 08115)

Variety Form	Application			Total/ season, g ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	g ai/ha	No	Interval days					
GAP, USA peanut	0.10–0.18	3	7	1.12	7			
Apply in a minimum of 93 L/ha spray or more to provide full foliar coverage								
VA-C98R	0.18	3	8	0.493	7	51	44	03-MD05
458	0.18	3	7	0.497	6	29	25	03-CO10
Perry	0.18	4	21 [a],8,6	0.641	8	< 0.01	0.22	03-GA*06
PG D.P.1	0.18	4	21 [a],8,6	0.641	8	0.15	0.30	03-GA*07
C99R	0.18	4	21 [a],8,6	0.64	8	0.11	0.46	03-GA*08
GA 02C	0.18	4	21 [a],8,6	0.64	8	0.30	1.14	03-GA*09
Gregory	0.18	3	7	0.482	7	8.6	17	03-NC03
Perry	0.18	3	7	0.482	7	11	9.0	03-NC04

Variety Form	Application			Total/ season, g ai/ha	PHI, days	Residue, mg/kg		Trial Id.
	g ai/ha	No	Interval days					
NC 11	0.18	3	7	0.481	7	14	11	03-NC05
NC12	0.18	3	7	0.483	7	13	10	03-NC06
Tamrun 96	0.18	3	6	0.48	7	23	27	03-TX11
Tamrun 96	0.18	3	6	0.492	6	33	25	03-TX12

[a] Between 1st and 2nd application, the 4th treatment was near maturity

Table 30 Residues in soya bean forage treated with methoxyfenozide in supervised trials in the USA in 2001 (Report No.34-01-07)

Location, (Variety) Trial number	Application			Total/ season kg ai/ha	PHI, days	Residue, mg/kg		
	Form	g ai/ha	No			Methoxyfenozide	OH-Methoxyfenozide	G-methoxyfenozide
GAP, USA Soya bean		0.0670.135	4	1.12	7			
Apply in a minimum of 93 L/ha spray or more to provide full foliar coverage								
Athens, GA, Hutcheson 21801052	2F	0.28	4	1.12	7	8.0 9.0	ND (0.0082)	0.056, 0.0657
Chula, GA, Hartz H7550 RR 21801053	2F	0.28	4	1.12	7	2.6, 2.3	(0.019) (0.015)	0.46 0.59
Proctor, AR, AG 4902 21801054	2F	0.28	4	1.12	7	6.4 7.2	(0.0076) (0.0086)	0.12 0.12
Washington, LA, DP 5915 RR 21801055	2F	0.28	4	1.12	7	0.38 0.38	(0.010) (0.011)	0.34 0.35
Greenville, MS, Ashgrow 4702 21801056	2F	0.28	4	1.12	7	2.4 4.3	(0.0093) (0.013)	0.21 0.32
	80WP	0.28	1	0.28	7	1.7 2.0 1.95	(0.0092) (0.011) (0.011)	0.17 0.22 0.22
Geneva, MN, Ashgrow 2201 21801057	2F	0.28	4	1.12	7	29 36	0.17 0.25	0.70 0.73
Richland, IA, Pioneer 93 BO1 21801058	2F	0.28	4	1.12	7	6.0 6.6	(0.0097) (0.011)	0.19 0.22
Wichita, KS, NC+ 3A87, 21801059	2F	0.28	4	1.12	6	8.8 8.5	ND ND	(0.034) (0.028)
Britton, SD SD 109IRR, 21801060	2F	0.28	4	1.12	7	13 10 11	ND ND ND	(0.031) (0.025) (0.023)
Marysville, OH, C-9284 RR, 21801061	2F	0.28	4	1.12	7	0.86 4.4	ND (0.011)	(0.044) 0.13
Sparta, IL, 6443 NRR, 21801062	2F	0.28	4	1.12	7	1.1 0.91	(0.0088) (0.0073)	0.15 0.10
York, NE, NE 2596 21801064	2F	0.28	4	1.12	7	5.5 6.1	(0.0069) (0.0088)	0.058 0.069
	80WP	0.28	1	0.28	7	6.0 5.1	(0.0063) (0.0071)	0.054 0.057

Location, (Variety) Trial number	Application			Total/ season kg ai/ha	PHI, days	Residue, mg/kg		
	Form	g ai/ha	No			Methoxyfenozide	OH-Methoxyfenozide	G-methoxyfenozide
Campbell, MN, DKB 06-51 (Roundup Ready) 21801065	2F	0.28	4	1.12	7	11 10	(0.0089) (0.0066)	(0.043) 0.053
	80WP					9.2 10 9.7	ND ND ND	0.056 (0.05) 0.058
Carlyle, IL H3371 CR 21801066	2F	0.28	4	1.12	0	27 25	ND ND	ND ND
					7	13 12	(0.0075) (0.0065)	0.054 (0.0475)
					14	2.5 1.8	(0.0072) (0.0078)	0.14 0.12
					21	0.76 0.63	ND ND	0.097 0.064
Arkansaw, WI Ashgrow AG0801 21801067					0	21 24	ND ND	ND ND
					7	4.2 4.19	(0.006) (0.0068)	0.082 0.088
					14	2.2 2.1	ND ND	0.087 0.10
					21	0.62 0.79 0.76	ND ND ND	0.077 0.084 0.087

Table 31 Residues in soya bean hay treated with methoxyfenozide in supervised trials in the USA in 2001 (Report No.34-01-07)

Location, (Variety) Trial number	Application			Total/ season kg ai/ha	PHI, days	Residue, mg/kg		
	Form	g ai/ha	No			Methoxyfenozide	OH-Methoxyfenozide	G-methoxyfenozide
GAP, USA Soya bean		0.0670.135	4	1.12	7			
Apply in a minimum of 93 L/ha spray or more to provide full foliar coverage								
Athens, GA, Hutcheson 21801052	2F	0.28	4	1.12	7	20 24	0.088 0.098	0.52 0.79
Chula, GA, Hartz H7550 RR 21801053	2F	0.28	4	1.12	7	15 11	0.49 0.40	026 0.17
Proctor, AR, AG 4902 21801054	2F	0.28	4	1.12	7	45 46	0.070 0.065	0.90 0.84
Washington, LA, DP 5915 RR 21801055	2F	0.28	4	1.12	8	18 20 21	0.16 0.11 0.11	0.89 1.2 1.3
Greenville, MS, Ashgrow 4702 21801056	2F	0.28	4	1.12	7	11 21	0.19 0.32	0.15 0.14
	80WP	0.28	1	0.28	7	14 14	0.28 0.25	0.11 0.12
Geneva, MN, Ashgrow 2201 21801057	2F	0.28	4	1.12	7	13 11	ND ND	(0.031) (0.030)

Location, (Variety) Trial number	Application			Total/ season kg ai/ha	PHI, days	Residue, mg/kg		
	Form	g ai/ha	No					
Wichita, KS, NC + 3A87, 21801059	2F	0.28	4	1.12	7	18 14	0.087 0.075	0.77 0.62
Britton, SD SD 109IRR, 21801060	2F	0.28	4	1.12	7	30 28	0.075 0.070	0.70 0.80
Marysville, OH, C-9284 RR, 21801061	2F	0.28	4	1.12	7	11 20 18	0.062 0.061 0.055	0.89 1.2 1.3
Sparta, IL, 6443 NRR, 21801062	2F	0.28	4	1.12	7	29 32	0.037 0.045	0.59 0.78
York, NE, NE 2596 21801064	2F	0.28	4	1.12	7	55 48	0.040 0.033	0.82 0.69
	80WP	0.28	1	0.28	7	37 26	0.032 0.024	0.78 0.55
Campbell, MN, DKB 06-51 (Roundup Ready) 21801065	2F	0.28	4	1.12	7	8.87 11	0.052 0.064	0.69 0.81
	80WP	0.28	1	0.28	7	9.0 5.9 5.6	0.067 0.047 0.045	0.99 0.51 0.46
Carlyle, IL H3371 CR 21801066	2F	0.28	4	1.12	0	62 43	0.028 0.020	0.33 0.22
					7	55 60	0.053 0.067	0.37 0.44
					14	10 13	0.029 0.030	0.36 0.44
					21	8.2 7.7	0.023 0.025	0.40 0.41
Arkansaw, WI Ashgrow AG0801 21801067					0	87 62	0.11 0.097	1.1 0.63
					7	24 33	0.090 0.12	1.1 1.7
					14	15 16	0.29 0.26	1.3 1.4
					21	9.6 6.4 6.4	0.39 0.23 0.24	1.6 1.0 1.0

FATES OF RESIDUES IN STORAGE AND PROCESSING

Processing studies were provided on orange, sugar beet, soya bean and peanut.

Orange

In order to obtain fruits with high residue a special trail was conducted in California (IR-4 PR No. 09367/ 06-CA142) where the orange trees were treated once at 1.12 kg ai/ha, and the fruits were collected 3 days later. The orange samples were first washed with water to which FMC Fruit Cleaner 395 and Baker Antifoam B silicone emulsion had been added. The oranges were then peeled by mechanical abrasion for oil recovery. The oil sacs in the peel were broken by the abrasion and the oil was collected using a water mist, yielding an emulsion of water, oil, and small pieces of orange peel. The oil emulsion was then subjected to treatment by the complex pectinase enzyme Pectinex 3XL at a level of 0.2% and reacted overnight at a temperature of approximately 21 °C. The emulsion was then

passed through a screen separator to remove the peel solids and then run through a Westfalia separator/clarifier to yield the oil fraction, which was then filtered, treated with anhydrous sodium sulphate (to remove remaining water), and filtered again before being placed in frozen storage.

The abraded oranges were taken for juice extraction, which was accomplished by processing them through a Juice Tree juice extractor. The raw juice was then processed through a finisher with a 0.050 cm screen to remove large pieces of pulp and peel. A portion of the finished juice fraction was then pasteurized and canned at 90 °C for 5 minutes. The peel from the juice extraction process was shredded using a Rietz grinder with a 1.27 cm screen, and combined with peel and pulp solids from the oil processing steps. This mixture was then run through a ribbon blender and mixed with water and lime (120 g/L) to neutralize the acidity, and then pressed using continuous screw presses. A portion of the resulting wet pulp was then spread on stainless steel trays, weighed, and dried at 61–76o°C for 8.5 to 10.75 hours before being placed in frozen storage.

Three studies were also carried out in South Europe. For processing and residue analysis, orange fruits were taken from the treated and the control plot on day 14 after the last application (Report No.34-99-01) in Italy and Spain. The fruits were treated at about maximum registered rates (Italian trial 703745: 2 × 0.192 kg ai/ha 10 days apart, Spain trial 705195: 0.288 + 0.192 kg ai/ha, 10 days apart). At the third trial in Spain (Report No. 34-99-134) 2 foliar treatments of orange were made at 0.192 kg/ha 10 days apart. Samples were taken 15 day after the second treatment.

The preparation of marmalade was done using household practice. The processing procedures juice simulated the commercial practice at a laboratory scale.

The oranges were washed in standing water under slow movement. After washing, the oranges were peeled with a knife. Subsequently the peel was cut into small stripes and the fruit pulp was minced with a mixer and passed through a strainer to separate pulp waste and fruit puree. Sugar, gelling agent and the peel stripes were added to the fruit puree. The orange marmalade was heated up to 98–100 °C for about 3 minutes.

After cooking, the orange marmalade was cooled down and stored deep frozen for three days at –18 °C or below.

The peeled oranges were pressed into pulp waste and raw juice. After pressing, the raw orange juice was pasteurized up to 85–89 °C.

In the third trial (Report No. 34-99-134), the preparation of marmalade was done using household practice. The processing procedures of juice simulated the commercial practice at a laboratory scale.

Results of processing of oranges are summarized in Table 32.

Table 32 Results of orange processing

	Study No				Processing factor (pf)/Study				Best estimate of pf
	1	2	3	4	1	2	3	4	
Fruit	0.198	0.224	0.13	0.245					
Peel	0.571	0.941	0.52		2.884	4.201	4.000		4.0
Pulp	< 0.05	< 0.05	< 0.05	0.269 a	< 0.253	< 0.223	< 0.385	1.098 a	1.1 a
Marmalade	0.10	0.239	0.1		0.505	1.067	0.769		0.77
Juice	< 0.05	< 0.05		< 0.05	0.253	0.223		0.204	0.22
Oil				10.4				42.45	42.5

Report/Trial Numbers: Study 1. 34-99-01/703745; Study 2: 34-99-01/705195; Study 3: 34-99-134; Study 4. IR-4 PR No. 09367 (06-CA142)

[a] Dried pulp was analysed in Study 4, while the wet pulp in Studies 1–3.

Peanut

A supervised trial was conducted on peanuts at approximately 3× maximum rate for processing peanuts to oil. Samples were collected 6 days after the 3rd application. The peanuts were processed in a way that simulated industrial practices as closely as possible (IR-4 PR No. 08115 trial number 03-TX-12). The peanuts were dried between 54–71 °C until the moisture content of hull material was 7–12%. The light impurities were aspirated then the sample was screened in a two-way cleaner. The whole peanut was cracked to liberate the kernel (nutmeat). After shelling, the material was aspirated; the kernel material was dried at 54–71 °C to a final moisture content of 7–10%. The moisture content of the kernel was adjusted to 12%, then the kernel was heated to 93–104 °C and pressed to liberate part of the crude oil. The press cake was extracted three times with hexane at about 49–60 °C. The miscella (crude oil and hexane) was passed through a Precision Scientific Recovery unit to separate crude oil and hexane. The crude oil was heated to 73–90 °C to remove hexane. The crude oils recovered from the expeller and solvent extraction were combined and refined according to AOCS method Ca 9a 52. The residues measured in the processed fractions are summarised in Table 33.

Table 33 Summary of Methoxyfenozide Residue Data from Processing of Peanut

Processed Fraction	Residue Level (mg/kg)	Processing Factor
Nutmeat	0.0284 [a]	–
Meal	0.0280 [a]	–
Oil	0.0826 [b]	2.89

[a] Average of two analyses.

[b] Average of three analyses.

Sugar beet

Sugar beet roots were collected for processing from a supervised field trial performed at maximum label rate (IR-4 07522.00-ND05). The processing procedures simulated commercial processing as closely as possible. The sugar beets were washed in a stainless steel tub filled with warm water to remove adhering field soil. The cleaned beets were cut using a standard kitchen knife into pieces, if needed, and then shredded into cossettes using a food cutter/slicer. Sugar was extracted from the cossettes in a series of steam-heated Ball Canning Kettles (referred to as cells), with a mixture of fresh water and pulp press water. The cells were heated to approximately 65 to 80 °C while targeting a temperature of 70 to 75 °C. The cossettes and water were transferred counter current to each other through the series of four cells.

Extracted beet pulp was pressed to recover pulp press water. The pressed wet pulp was dried within a target range of 80 to 93 °C to less than 10% moisture. The dried pulp was milled and a representative sample of the dry beet pulp recovered was removed, packaged, labelled, and placed in frozen storage (–22 ± 8 °C) until shipment to the analytical laboratory.

Raw juice from the diffuser was frozen prior to purification, thawed, and purified in a steam-jacketed kettle by addition of lime and carbon dioxide. Temperature was maintained within a range of 80 to 90 °C. The precipitated impurities were coagulated by the addition of settling aid and allowed to settle and clarify. Clear juice was decanted and screened to remove suspended larger particles, if necessary, and the settled sludge was vacuum filtered using Buchner funnels. Filtrate was combined with the clear decanted liquid, and the filter cake was discarded. The clarified liquid was further purified by a second carbonation with carbon dioxide gas. Carbonated liquor was vacuum filtered using Buchner funnels, and the filter cake was discarded. The clarified juice was concentrated to within a range of 64 to 70 °C Brix in a vacuum evaporator.

The concentrated juice (thick juice) was heated within a range of 75 to 85 °C and vacuum filtered over diatomaceous earth using Buchner funnels, and the filter cake was discarded. The filtered thick juice was placed in frozen storage for later processing. The filtered thick juice was removed from frozen storage and warmed to reduce viscosity, then fed to the Laboratory Vacuum Pan and

Granulator for crystallization of sugar. The massecuite was heated to within a range of 70 to 75 °C, prior to discharge. The massecuite was centrifuged in a centrifuge equipped with a perforated bronze centrifuge basket. Molasses (the initial spin-off syrup) was collected from the centrifuge. A representative sample of the molasses was removed, packaged, labelled, and placed in frozen storage (–22 ± 8 °C) until shipment to the analytical laboratory.

Sugar retained in the centrifuge basket was washed with clean purified water at 86 to 96 °C. The washed sugar was removed from the centrifuge basket and placed in the mixing bowl of a mixer. Hot air was used to heat the bowl while the wet sugar was stirred until dry. A representative sample of the refined sugar was removed, packaged, labelled, and placed in frozen storage (–22 ± 8 °C) until shipment to the analytical laboratory. The residues measured in processed fractions are shown in Table 34.

Table 34 Methoxyfenozide residues in processed fractions of sugar beet following a treatment with 3× rate

Commodity	Residue mg/kg	Processing factor
Roots for processing	0.14	
Refined sugar	< 0.01	0.0714
Dried pulp	0.12	0.857
Molasses	0.16	1.143

Soya bean

Supervised trial was conducted at 5× maximum label rate to obtain residues in soya bean for processing. The harvested soya bean was dried at 43–57 °C until the moisture content was 10–13%. After drying, the sample was aspirated to remove dust. The aspirated grain fractions were classified by sieving. After aspiration, the soya bean was screened to remove foreign particles. The cleaned whole soya bean was fed into a Bauer disc mill to crack the hull and liberate the kernel. After hulling, the material was passed through an aspirator to separate the hull and kernel material.

The kernel material was heated to 70–80 °C, flaked and fed into an expander/extruder fitted with a 7/16 inch die. As the material moved through the expander, steam was injected directly onto the product. After expansion, the collets were dried and promptly taken to solvent extraction with hexane. The miscella (crude oil and hexane) was passed through a Precision Scientific Recovery unit to separate the crude oil and hexane. Crude oil was then heated to 73–90 °C for hexane removal. The crude oil was refined according to AOCS Method Ca 9b-52.

Table 34 Results of processing of soya bean treated with methoxyfenozide at 5× rate in 2001 in the USA

Commodity	Residue mg/kg	Processing factor
Seed	3.35	
Hulls	5.85	1.75
Meal	0.22	0.07
Oil	2.22	0.66
Aspirated grain fraction Grain	491	147

APPRAISAL

Methoxyfenozide was evaluated by the JMPR for residues and toxicology in 2003, when an ADI of 0-0.1 mg/kg bw and an ARfD of 0.9 mg/kg bw were established and maximum residue levels, supervised trial median residues and highest residues were recommended for a number of commodities. The residue was defined as methoxyfenozide for compliance with MRLs and for dietary

intake estimation in both plant and animal commodities. The residue is fat-soluble, but is not classed as fat-soluble with respect to its distribution in milk.

Additional residue data and information on use patterns as well as residue analytical methods were submitted for evaluation by the present meeting on citrus fruits, small fruits and berries, tropical fruits with inedible peel, cucurbits, legume vegetables, pulses, and root and tuber vegetables.

Methods of Analysis

The fully validated analytical methods used in the supervised trials were based on LC/MS/MS detection. The average recovery values reported at various fortification levels were between 76 and 107%. The LOQ values ranged from 0.01 mg/kg to 0.07mg/kg.

The tests for stability of residues under deep-frozen conditions were performed in oranges, orange processed fractions, peas, radishes, sugar beets, sweet potatoes and peanuts. They indicated that the residues were stable during the deep-frozen storage intervals.

Results of supervised trials on crops

Most of the supervised trials were conducted within the programme of IR-4 in the USA where the maximum total seasonal application rate is 1.12 kg ai/ha. Some trials were from Europe and residue data on soya bean was obtained from trials carried out by Dow AgroSciences in the USA.

The NAFTA calculator was used as a tool in the estimation of the maximum residue level from the selected residue data set obtained from trials conducted according to GAP. As a first step, the Meeting reviewed all relevant factors related to each data set in arriving at the best estimate of the maximum residue level using expert judgement. Then the NAFTA calculator was employed. If the statistical calculator spreadsheet suggested a different value from that recommended by JMPR, a brief explanation of the deviation would be supplied. Some common factors that may lead to rejection of the statistical estimate include when the number of data points in a data set is < 15 or when there are a large number of values < LOQ.

Citrus fruit

Supervised trials were conducted on oranges (2) lemons (2) and grapefruit (2) in California and Texas during the 2005 and 2006 growing seasons that complied with the registered use patterns in the USA (dosage rate 0.134–0.28 kg ai/ha with 4 applications at 14–17 days intervals and PHI of 1 day.) The residues in whole fruits were: grapefruit: 0.12, 0.28 mg/kg; orange: 0.17, 1.7 mg/kg; lemon: 0.41, 0.93 mg/kg.

Nine supervised trials were performed on oranges in Greece, Italy, Portugal and Spain. The use pattern is 0.144–0.192 kg ai/ha with 2 applications at 10-day intervals and PHI of 14 days in Greece, Portugal and Spain. The Italian trials were also evaluated according to the use pattern in the other South European countries. The residues in whole orange were in rank order: 0.06, 0.13, 0.14, 0.16, 0.18, 0.19, 0.21, and 0.34 mg/kg.

Eight residue trials were performed on mandarins in South Europe, which were evaluated according to the GAP in Greece, Portugal and Spain (dosage of 0.144–0.192 kg ai/ha with 2 applications at 10 day interval, PHI of 14 days) taking into account the dosage at the last application. The residues in whole mandarin were in rank order: 0.11, 0.16, 0.21, 0.24, 0.27, 0.30, 0.35 and 0.45 mg/kg.

The Mann-Whitney U-test indicated that residue distributions in orange and mandarin were not significantly different and they can be combined: 0.06, 0.11, 0.13, 0.14, 0.16, 0.16, 0.18, 0.19, 0.21, 0.21, 0.24, 0.27, 0.3, 0.34, 0.35, and 0.45 mg/kg.

In the same trials, the residues in 17 orange and mandarin pulp samples 14 days after the last application were: < 0.05 mg/kg. As the residue data from US trials is not sufficient for estimation of maximum residue levels for citrus fruits, and the US GAP is quite different from that in South Europe.

The Meeting estimated the following residue levels in citrus fruits based on the European GAP and residue data: maximum residue level of 0.7 mg/kg, median residue and HR of 0.05 mg/kg. The value derived from use of the NAFTA calculator was 0.7 mg/kg which corresponds to the maximum residue level of 0.7 mg/kg estimated by the current Meeting.

Blueberry

Eight field trials were performed in the USA with three foliar applications of the test substance, 6–9 days apart at rates ranged from 0.27 to 0.30 kg ai/ha per application (US GAP: dosage rate 0.134–0.28 kg ai/ha with 3 applications at 7 day interval and PHI of 7 days.). Samples were collected 6–7 days after last application. The residues measured in six independent trials were in rank order: 0.54, 0.85, 1.1, 1.4, 1.8, and 2.0 mg/kg.

The Meeting estimated a maximum residue level of 4 mg/kg, median residue of 1.25 mg/kg, HR of 2 mg/kg. The value derived from use of the NAFTA calculator was 3.5 mg/kg that after rounding up to one figure, agrees with the maximum residue level of 4 mg/kg estimated by the current Meeting.

Cranberry

The trials evaluated by the 2006 JMPR were submitted again. The results were not evaluated by this meeting.

Strawberry

Eight field trials were conducted in USA with four or five foliar applications at a rate of approximately 0.28 kg ai/ha (1.33 times maximum US GAP: dosage 0.1/0.21 kg/ha at 14 day intervals, PHI of 3 days) amounting to a total seasonal rate of approximately 1.12 kg ai/ha. Samples were collected at 2–4 days after the final application. The residues were: 0.18, 0.20, 0.21, 0.24, 0.43, 0.49 and 1.2 mg/kg.

The Meeting estimated a maximum residue level of 2 mg/kg, median residue of 0.24 mg/kg and HR of 1.2 mg/kg. The value derived from use of the NAFTA calculator was 1.7 mg/kg which, after rounding up to one significant figure, was in agreement with the maximum residue level of 2 mg/kg estimated by the current Meeting.

Avocado

Six trials were conducted in the USA with four applications corresponding to maximum US GAP (dosage rate 0.18–0.28 kg ai/ha with five applications at 6 day intervals, PHI of 2 days and total seasonal rate of 1.12 kg ai/ha.).

The residues in five independent trials were 0.06, 0.08, 0.13, 0.16 and 0.41 mg/kg.

The Meeting estimated maximum, HR and median residues of 0.7 mg/kg, 0.41 and 0.13 mg/kg. The value derived from use of the NAFTA calculator was 0.7 mg/kg which was in agreement with the maximum residue level estimated by the current Meeting.

Papaya

Four trials were conducted in the USA at maximum US label rate (GAP: dosage rate 0.21–0.28 kg ai/ha with maximum five applications at 10-day intervals, PHI is 3 days). Samples taken from independent trials 3–4 days after last application contained residues: 0.18, 0.31 and 0.33 mg/kg. The residue in samples taken from a replicate plot was 0.17 mg/kg.

The Meeting estimated a maximum residue level of 1 mg/kg, median residue of 0.31 and high residue of 0.33 mg/kg. The value derived from use of the NAFTA calculator was 0.6 mg/kg. However, the Meeting considered this value too low, as previously evaluated data sets indicate that

two times the median value would cover only less than 70% of the residues derived from trials performed with various compounds at maximum GAP in commodities belonging to the Codex commodity group of 'Assorted tropical fruits – inedible peel' (FI).

Fruiting vegetables, Cucurbits

Cantaloupe

Seven trials were conducted in the USA with application rates of 1.55 times maximum US GAP (dosage rate 0.067–0.18 kg/ha, four applications at 7 day intervals, with a PHI of 3 days).

As the application rate did not match the GAP, the Meeting could not estimate a maximum residue level.

Cucumber

Eight trials were conducted in the USA with application rates of 1.55 maximum US GAP (dosage rate 0.067–0.18 kg/ha, four applications at 7 days intervals, PHI 3 days).

As the application rate did not match the GAP, the Meeting could not estimate a maximum residue level.

Squash, Summer

Six trials were conducted in the USA with application rates of 1.55 maximum US GAP (dosage rate 0.067–0.18 kg/ha, four applications at 7 days intervals, PHI 3 days).

As the application rate did not match the GAP, the Meeting could not estimate a maximum residue level.

Legume vegetables

Beans (in pods)

Six field trials were conducted in the USA with maximum US GAP (4 × 0.28 kg ai/ha, 7–14 days apart, PHI 7 days). The samples collected7–8 days after last application contained residues of: < 0.05, < 0.05, < 0.05, 0.079, 0.62 and 0.99 mg/kg.

The Meeting estimated a maximum residue level of 2 mg/kg, median residue of 0.065 mg/kg and HR of 0.99 mg/kg. The value derived from use of the NAFTA calculator was 0.45 mg/kg. However, it was considered too low as 2 of 6 valid residue values were higher.

Beans and peas succulent shelled

Seven field trials were conducted on beans in the USA with four or five foliar applications corresponding to maximum US GAP (4 × 0.28 kg ai/ha at 7–14 days, PHI of 7 days). The Meeting considered that an early application did not have any influence on the residues in shelled beans and evaluated the residue data together. Two trials were performed at the same site using different varieties. The residues measured in shelled beans after 6–7 days PHI were: < 0.05 (4), 0.052, 0.086 and 0.14 mg/kg.

Eight field trials were conducted on peas according to maximum US GAP (4 × 0.28 kg ai/ha at 7–14 days, PHI of 7 days). Two field trials conducted on the same site were not considered independent and only the highest residue was used for evaluation. The residues found in the independent trial samples were: < 0.05 (3), 0.058, 0.12, 0.14, and 0.18 mg/kg.

The Meeting noted that the residue populations in shelled beans and peas were not significantly different and can be combined: < 0.05 (7), 0.052, 0.058, 0.086, 0.12, 0.14, 0.14 and 0.18 mg/kg.

The Meeting estimated a maximum residue level of 0.3 mg/kg, median residue of 0.05 mg/kg and HR of 0.18 mg/kg for shelled succulent beans and peas. The value derived from use of the NAFTA calculator was 0.3 mg/kg which was in agreement with the maximum residue level estimated by the present Meeting.

Pulses

Dry beans

Thirteen field trials were conducted in the USA according to maximum US GAP (4 × 0.28 kg ai/ha at 7–14 days, with a PHI of 7 days).

Several trials were conducted at the same site. The residues in independent trials were < 0.05 (9) and 0.22. No explanation as to the cause of the high detectable residue could be found in the trial report.

The Meeting noted that the residue distribution in succulent beans and peas support the residue distribution in dry beans and peas, and estimated a maximum residue level of 0.5 mg/kg, and median residue of 0.05 mg/kg. The NAFTA calculator was not used due to the large proportion of values below the LOQ.

Cowpea (Black eyed pea), dry

Six field trials were conducted in the USA according to maximum US GAP (4 × 0.28 kg ai/ha at 7–14 days, 7 day PHI). After harvest, the peas were dried for up to 11 days and shelled. Two trials were conducted at the same site approximately 20 days apart.

The residues in independent trials were 0.13, 0.17, 0.56, 0.67, and 3.4 mg/kg

The Meeting estimated a maximum residues level of 5 mg/kg, and median residue of 0.56 mg/kg. The value derived from use of the NAFTA calculator was 5 mg/kg which was in agreement with the maximum residue level estimated by the present Meeting.

Soya bean

Sixteen residue trials, including two decline and three bridging studies, were conducted in the USA with 4 applications over double the label rate each with a PHI of 14–15 days instead of the registered 7 days. In addition to the parent compound, the residues of OH-methoxyfenozide and the total sugar conjugates of methoxyfenozide (G-methoxyfenozide) were also determined.

As the trial conditions did not match the US label rate and PHI, the Meeting could not make and estimation or recommendation of a maximum residue level.

Root and tuber vegetables

Carrot

Seven field trials were conducted in the USA according to maximum US GAP (0.28 kg ai/ha, with a 14 day PHI). The residues measured were < 0.05, 0.057, 0.084, 0.13, 0.14, 0.16, and 0.31 mg/kg.

The Meeting estimated a maximum residues level of 0.5 mg/kg, median residue of 0.13 mg/kg and an HR of 0.31 mg/kg. The value derived from use of the NAFTA calculator was 0.5 mg/kg which was in agreement with the maximum residue level estimated by the present Meeting.

Radish

Five field trials were conducted in USA according to maximum US GAP (2 × 0.28 kg ai/ha, at 14 days, with a PHI of 14 days). The residues in radish were: < 0.05, <0.05, 0.08, 0.10 and 0.12 mg/kg

The Meeting estimated a maximum residues level of 0.4 mg/kg, median residue of 0.08 mg/kg and an HR of 0.12 mg/kg for radish. The value derived from use of the NAFTA calculator was 0.35 mg/kg which was comparable with the maximum residue level estimated by the present Meeting.

The residues in radish tops with leaves were: 0.33, 0.34, 0.75, 1.8, and 4.0 mg/kg.

The Meeting estimated a maximum residues level of 7 mg/kg, median residue of 0.75 mg/kg and an HR of 4.0 mg/kg for radish leaves including tops. The value derived from use of the NAFTA calculator was 7 mg/kg which was in agreement with the maximum residue level of 7 mg/kg estimated by the present Meeting.

Sugar beet

Eleven field trials were conducted in the USA according to maximum US GAP (0.28 kg ai/ha with a PHI of 7 days). The residues measured in roots were: < 0.05(3), 0.066, 0.092, 0.11, 0.13, 0.14, 0.14, 0.17, and 0.18 mg/kg.

The Meeting estimated a maximum residues level of 0.3 mg/kg, median residue of 0.11 mg/kg and an HR of 0.18 mg/kg. The value derived from use of the NAFTA calculator was 0.3 mg/kg which agreed with the maximum residue level of 0.3 mg/kg estimated by the current Meeting.

Sweet potato

Nine field trials were conducted in the USA according to maximum US GAP (3 × 0.18 kg ai/ha at 14 days, 7 days PHI). The residues measured in roots were < 0.01 (8) and 0.012 mg/kg.

The Meeting estimated a maximum residues level of 0.02 mg/kg, median residue of 0.01 mg/kg and an HR of 0.012 mg/kg for sweet potato. The NAFTA calculator was not used due to the large proportion of values below LOQ.

Peanut

Supervised field trials on peanut were conducted in Maryland, Colorado, Georgia (four trials at the same site), North Carolina (four trials at the same site), and Texas (two trials at the same site) according to maximum US GAP (3 × 0.10-0.18 at 7-day intervals, PHI of 7 days). The varieties were also the same in the trials in Texas. The residues were below the LOQ in all trials except one where 0.011 and 0.016 mg/kg were measured in replicate samples of peanut meat.

The Meeting estimated a maximum residues level of 0.03 mg/kg, median residue of 0.01 mg/kg and an HR of 0.016 mg/kg. The NAFTA calculator was not used due to the large proportion of values below LOQ.

Fate of residues during processing

The fate of methoxyfenozide residues during processing was examined in oranges, peanut and sugar beet in processing studies simulating the industrial processing as far as possible. The marmalade was prepared according to household practice. Estimated processing factors and STMR-Ps are summarised below.

Raw agricultural commodity (RAC)	Processed commodity	Calculated processing factors	PF (Mean, median or best estimate)	RAC-STMR (mg/kg)	STMR-P (mg/kg)
Orange	Orange peel	2.884, 4.201, 4.0	4.0		
	Orange pulp dry	< 0.253, < 0.223, < 0.385, 1.098	1.1	0.2	0.22
	Marmalade	0.505, 1.067, 0.769	0.77		
	Orange juice	0.253, 0.223	0.22	0.05	0.011
	Orange oil	42.5	42.5		
Peanuts	Peanut oil	2.89	2.89	0.01	0.0289
Sugar beet	Sugar beet molasses	1.143	1.14	0.11	0.126
	Refined sugar	0.071	0.071		

Based on the processing factors, the Meeting estimated STMR values of 0.22 mg/kg for dry orange pulp (based on median residue of 0.2 mg/kg in whole fruits), 0.011 mg/kg for citrus juice, 0.0289 for refined peanut oil, and 0.126 mg/kg for sugar beet molasses.

On processing peanuts, methoxyfenozide concentrated in the oil. The Meeting decided to estimate a maximum residue level for peanut oil refined of 0.1 mg/kg based on a highest residue for peanuts of 0.016 mg/kg and a processing factor of 2.89 (0.016 mg/kg × 2.89 = 0.05 mg/kg).

Residues in animal feed

The residues in animal feed were measured in crops derived from supervised trials conducted according to maximum US GAPs which are reported above under individual commodities.

Residues in/on bean foliage treated with methoxyfenozide at maximum GAP were: 3.4, 4.6, 5.3, 6.6, 16, and 32 mg/kg.

The Meeting estimated a highest residue of 32 mg/kg and a median residue of 5.95 mg/kg.

Residues in sugar beet tops were: 0.85, 0.85, 1.9, 2.6, 3.3, 3.6, 3.8, 4.7, 4.9, 9.5 and 10 mg/kg.

The Meeting estimated a highest residue of 10 mg/kg and a median residue of 3.8 mg/kg.

Residues in peanut hay were: 0.22, 0.3, 0.46, 1.1, 9.0, 13, 14, 17, 27, 29, 33, and 51 mg/kg

The Meeting estimated, respectively maximum, highest and median residue levels of 80mg/kg, 60 mg/kg and 16 mg/kg based on dry weight basis (85% dry matter) corresponding to 70 mg/kg on peanut hay, highest residue of 51 mg/kg and a median residue of 13.5 mg/kg for peanut fodder as received. (NAFTA calculator indicates 50 mg/kg maximum residue for commodity as received. However, it was considered too low as previously evaluated data sets indicate that 4 times the median value would cover only less than about 60% of the residues derived from trials performed with various pesticides at maximum GAP in commodities belonging to the Codex commodity group of Legume animal feeds (AL)).

Residues were reported in soya bean forage and hay. As the application conditions did not match GAP, the residues were recorded in the monograph but not evaluated.

Residues in animal commodities

Estimated maximum and mean dietary burdens of farm animals

Dietary burden calculations for beef cattle, dairy cattle are provided in Annex 6.

		Animal dietary burden, methoxyfenozide [ppm] in dry matter diet		
		US-Canada	EU	Australia
Beef cattle	max	47.92	44.65	78.86
	mean	12.30	10.62	16.55
Dairy cattle	max	30.41	40.76	82.00[a]
	mean	9.61	9.74	16.66[b]

[a] Highest maximum beef or dairy cattle dietary burden suitable for MRL estimates for mammalian meat and milk.

[b] Highest mean beef or dairy cattle dietary burden suitable for STMR estimates for mammalian meat and milk.

The 2003 JMPR estimated maximum dietary burdens of methoxyfenozide for beef cattle, dairy cattle, and poultry of 26 ppm, 31 ppm, and 0.07 ppm, and median dietary burdens of 7.5 ppm, 7.8 ppm, and 0.07 ppm, respectively. The maximum and mean dietary burdens for beef and dairy cattle based on the new OECD feed consumption figures and the residue levels estimated by the present Meeting are 82 ppm and 16.66 ppm, respectively.

Farm animal feeding studies

The 2003 JMPR reported feeding studies on cows, where three cows at each level were dosed orally with the equivalent of 16, 54, or 180 ppm in the diet for 28 consecutive days. Milk was collected daily and analysed on days 1, 2, 4, 7, 10, 14, 17, 21, 24, and 28. The cows were slaughtered within 24 h of the last dose, and tissues were collected and analysed for methoxyfenozide and the glucuronide conjugate of the A-ring phenol.

The residues [mg/kg] detected in various tissues at feeding levels given are summarised below:

Tissue	Residue level	16 ppm	54 ppm	180 ppm
Milk	Max	< 0.01	< 0.01	0.1
	Average	< 0.01	< 0.01	0.028
Muscle	Max	< 0.003	< 0.003	0.1
	Average	< 0.003	0.028	0.073
Fat	Max	0.011	0.082	0.44
	Average	< 0.01	0.041	0.28
Liver	Max	< 0.003	0.03	0.15
	Average		0.028	0.13
Kidney	Max	< 0.01	< 0.01	0.034
	Average	< 0.01	< 0.01	0.026

The Meeting interpolated the residues measured following feeding with 54 ppm and 180 ppm methoxyfenozide in the diet. The calculated maximum and average (in brackets) residues were: milk: 0.03 mg/kg, (0.014 mg/kg), muscle: 0.025 mg/kg (0.019 mg/kg), fat: 0.162 mg/kg (0.094 mg/kg), liver: 0.057 mg/kg (0.051 mg/kg), and kidney: 0.015 mg/kg (0.014 mg/kg)

The Meeting estimated a maximum residue level, HR and median residue, respectively, 0.1 mg/kg, 0.057 mg/kg, 0.051 mg/kg for edible offal; of 0.2 mg/kg, 0.162 mg/kg, 0.094 mg/kg for meat from mammals other than marine mammals (based on fat) and maximum residue level and median residues of 0.05 mg/kg, 0.03 mg/kg for whole milk. .

The new maximum or median level recommendations do not affect the dietary burden of poultry. The residue levels estimated by the 2003 JMPR remain the same.

RECOMMENDATIONS

On the basis of data from supervised trials, the Meeting concluded that the residue levels listed in Table below are suitable for establishing MRLs and for dietary risk assessment.

Definition of the residue for compliance with MRLs and for estimation of dietary intake: *methoxyfenozide*

The residue is fat-soluble, but is not classed as fat-soluble with respect to its distribution in milk.

Commodity		MRL, mg/kg	STMR or STMR-P	HR or HR-P
CCN	Name	New	mg/kg	mg/kg
FI0326	Avocado	0.7	0.13	0.41
VP0061	Beans except broad bean and soya bean	2	0.065	0.99
VP0062	Beans, shelled	0.3	0.05	0.18
VD0071	Beans (dry)	0.5	0.05	
FB0020	Blueberry	4	1.25	2
VR0577	Carrot	0.5	0.13	0.31
FC0001	Citrus fruit	0.7	0.05	0.05
JF0001	Citrus juice		0.011	
VD0527	Cowpea (dry)	5	0.56	
MO0105	Edible offal (mammalian)	0.1	0.051	0.057
MM0095	Meat (from mammals other than marine mammals)	0.2 (fat)	Fat:0.094 Meat: 0.019	Fat:0.162 Meat: 0.025
ML0106	Milks	0.05	0.030	
	Orange pulp, dry		0.22	
FI0350	Papaya	1	0.31	0.33
SO0697	Peanut	0.03	0.01	0.016
AL0697	Peanut fodder, dry	80	13.5	51
OR0697	Peanut oil, refined	0.1	0.029	
VP0064	Peas shelled, (succulent seeds)	0.3	0.05	0.18
VR0494	Radish	0.4	0.08	0.1
VL0494	Radish leaves (including radish tops)	7	0.75	4.0
FB0275	Strawberry	2	0.24	1.2
VR0596	Sugar beet	0.3	0.11	0.18
	Sugar beet molasses		0.126	
VR0508	Sweet potato	0.02	0.01	0.012

DIETARY RISK ASSESSMENT

Long-term intake

The International Estimated Daily Intakes (IEDI) for methoxyfenozide was calculated from recommendations for STMRs for raw commodities in combination with consumption data for corresponding food commodities. The results are shown in Annex 3 of the 2009 JMPR Report.

The International Estimated Daily Intakes (IEDI) of methoxyfenozide in the 13 GEMS/Food Consumption Cluster Diets, based on the STMRs estimated by the 2003 and 2009 JMPR were in the range 0–8% of the maximum ADI of 0.1 mg/kg bw. The Meeting concluded that the long-term intake of residues of methoxyfenozide from uses considered by the Meeting is unlikely to present a public health concern.

Short-term intake

The International Estimated Short Term Intake (IESTI) for methoxyfenozide was calculated for the food commodities for which STMRs or HRs were estimated by the present Meeting and for which consumption data were available. The results are shown in Annex 4 of the 2009 JMPR Report.

The International Estimated Short Term Intake (IESTI) varied from 0–2% of the ARfD (0.9 mg/kg bw) for the general population. The IESTI varied from 0–6% of the ARfD for children 6 years and below. The Meeting concluded that the short-term intake of residues of methoxyfenozide from uses considered by the present Meeting is unlikely to present a public health concern.

REFERENCES

Code	Author	Year	Title, Institute, Report reference
	FAO	2004	Pesticide Residue in Food—2003, Plant Protection and Production Paper 177, 632-635.
34-99-01	Seym, M	1998	Determination of Residues ofRH-2485 240 SC in/on Orange in the Field in Italy, Spain (Marmalade and Juice) (ER). Study Nos: 703745, 705195
34-99-02	Seym, M and Deissler, A	1998	Determination of Residues ofRH-2485 240 SC in/on Orange in the Field in Italy, Spain and Portugal (ER). Study Nos: 703745, 703753, 705195, 705209, 705217
34-99-133	Walz-Tylla, B	1999	Determination of Residues ofRH-2485 240 SC in/on Orange in the Field in Italy, Spain and Portugal (ER). Study Nos: 810533, 810541, 814857, 814865
34-99-134	Walz-Tylla, B	1999	Determination of Residues ofRH-2485 240 SC on Orange (Fruit, Peel, Pulp, Marmalade) Following Spray Application in The Field in Spain, Study No: 810533
34-99-137	Walz-Tylla, B	1999	Determination of Residues of RH-2485 240 SC on Mandarin Following Spray Application in the Field in Italy, Spain. Greece and Portugal, Study Nos:810568, 814903, 814911, 814938
34P-01-07	Kuldas, RS	2003	RH-2485 Magnitude of the Residue, Residue Decline, Processing and Formulation Bridging Study in Soya bean
Ca 9a-52	AOCS	2009	Refining Loss
GRM: 02.25	Byrne, DL and Hastings MJ	2002	Determination of residues of methoxyfenozide in high moisture crops by liquid chromatography with tandem mass spectrometry detection, Dow AgroSciences LLC.
IR-4 PR No 09376	Dorschner, KW	2008	Methoxyfenozide: Magnitude of residues on citrus, Rutgers, The Stet University of New Jersey, Field id. Nos: 05-CA114, 05-CA115, 05-CA116, 05-CA117, 05-CA118, 05-CA142, 05_TX30
IR-4 PR No. 08115	Barney, WP		Methoxyfenozide: Magnitude of residue on peanut, Field id. Nos. 08115.03-MD05, 08115.03-CO10, 08115.03-GA*06, 08115.03-GA*07, 08115.03-GA*08, 08115.03-GA*09, 08115.03-NC03, 08115.03-NC04, 08115.03-NC05, 08115.03-NC06, 08115.03-TX11, 08115.03-TX12
IR-4 PR No07671	Samoil, KS	2008	Methoxyfenozide: Magnitude of residue on blueberry, Field id. Nos. 07671.03-ME01, 07671.03-NJ09, 07671.03-NJ10, 07671.03-MI11, 07671.03-MI12, 07671.03-MI13, 07671.03-NC02, 07671.03-OR03
IR-4 Study No. 07016	Dorschner, KW	2008	Methoxyfenozide: Magnitude of residue on cucumber Field id. Nos. 07016.99-MD02, 07016.99-GA*18, 07016.99-SC*04, 07016.99-FL24, 07016.99-TX15, 07016.99-OH*14, 07016.99-WI12, 07016.99-CA47
IR-4 Study No. 07018	Dorschner, KW	2008	Methoxyfenozide: Magnitude of residue on black eyed pea, Field id. Nos. 07018.99-TN04, 07018.99-TN05, 07018.99-GA*16, 07018.99-SC*06, 07018.99-NC08, 07018.99-CA50
IR-4 Study No. 07194	Dorschner, KW	2008	Methoxyfenozide: Magnitude of residue on squash Field id. Nos. 07194.99-NJ15, 07194.99-SC*03, 07194.99-GA*09, 07194.99-FL23, 07194.99-OH*08, 07194.99-CA46
IR-4 Study No. 07195	Dorschner, KW	2008	Methoxyfenozide: Magnitude of residue on cantaloupe Field id. Nos. 07195.99-GA*17, 07195.99-SC*05, 07195.99-TX16, 07195.99-OH*13, 07195.99-CA48, 07195.99-CA49, 07195.99-CA124

Code	Author	Year	Title, Institute, Report reference
IR-4 Study No. 07355	Dorschner, KW.	2008	Methoxyfenozide: Magnitude of residue on cranberry, Field id. Nos. 07355.99-MA01, 07355.99-NJ14, 07355.99-WI09, 07355.99-WI10, 07355.99-OR13, 07355.99-BC04
IR-4 Study No. 07531	Dorschner, KW.	2008	Methoxyfenozide: Magnitude of residue on bean (succulent shelled) Field id. Nos. 07531.00-GA*18, 07531.00-OH*15, 07531.00-CA162, 07531.01-MD12, 07531.01-MD13, 07531.01-NC16, 07531.01-ID12
IR-4 Study No. 07532	Dorschner, KW.	2008	Methoxyfenozide: Magnitude of residue on bean (edible podded) Field id. Nos. 07532.00-GA*17, 07532.00-OH*14, 07532.00-WA*15, 07532.00-CA141, 07532.01-NY18, 07532.01-FL33, 07532.01-WI13, 07532.01-IN01
IR-4 Study No. 075520	Dorschner, KW.	2008	Methoxyfenozide: Magnitude of residue on carrot Field id. Nos. 07520.00-GA*08, 07520.00-TX*22, 07520.00-OH*07, 07520.00-CA82, 07520.00-OR22, 07520.00-FL74, 07520.01-CA118
IR-4 Study No. 075521	Dorschner, KW.	2008	Methoxyfenozide: Magnitude of residue on carrot Field id. Nos. 07521.00-NY16, 07521.00-FL46, 07521.00-FL47, 07521.00-OH*13, 07521.00-CA88
IR-4 Study No. 075522	Dorschner, KW	2008	Methoxyfenozide: Magnitude of residue on sugar beat Field id. Nos. 07522.00-ND05, 07522.00-ND06, 07522.00-WI07, 07522.00-CA106, 07522.01-ND08, 07522.01-ND09, 07522.01-WI16, 07522.01-OH*18, 07522.01-CA*62, 07522.01-WA*27, 07522.01-CO13
IR-4 Study No. 075528	Dorschner, KW.	2008	Methoxyfenozide: Magnitude of residue on peas (succulent shelled) Field id. Nos. 07528.00-NJ23, 07528.00-WA*18, 07528.00-CA128, 07528.01-WI14, 07528.01-WI15, 07528.01-OH*16, 07528.01-OH*17, 07528.01-WA*26
IR-4 Study No. 075530	Dorschner, KW	2008	Methoxyfenozide: Magnitude of residue on bean (dry) Field id. Nos. 07530.02-NY23, 07530.02-NE01, 07530.02-NE02, 07530.02-NE03, 07530.02-ND12, 07530.02-ND13, 07530.02-CO13, 07530.02-CO14, 07530.02-WA*41, 07530.02-CA*115, 07530.02-ND19, 07530.02-ND20, 07530.02-ND21
IR-4 Study No. 08505	Dorschner, KW.	2008	Methoxyfenozide: Magnitude of residue on sweet potato Field id. Nos. 08505.03-MD14, 08505.03-NJ31, 08505.03-FL53, 08505.03-NC25, 08505.03-TX*36, 08505.03-TN07, 08505.03-NC26, 08505.03-SC*07, 08505.03-CA113
IR-4 Study No.06768	Dorschner, KW.	2008	Methoxyfenozide: Magnitude of residue on strawberry, Field id. Nos. 06768.00-CA*02, 06768.00-GA*02, 06768.00-FL04, 06768.00-NJ02, 06768.00-OR23, 06768.00-CA130, 06768.00-CA131, 06768.01-OH*01
IR-4 Study No.07060	Dorschner, KW	2008	Methoxyfenozide: Magnitude of residue on avocado Field id. Nos. 07060.04-TX*26, 07060.04-FL29, 07060.04-CA81, 07060.04-CA82, 07060.04-CA83, 07060.04-CA84
IR-4 Study No.07063	Dorschner, KW	2008	Methoxyfenozide: Magnitude of residue on papaya Field id. Nos. 07063.01-FL30, 07063.01-FL31, 07063.01-FL32, 7063.01-HI09
RA-2148/97	Seym, M	1999	Determination of Residues of RH-2485 240 SC on Mandarin Following Spray Application in the Field in Italy, Spain. Greece and Portugal, Study Nos:703761, 703788, 705284, 705292, 705306
TR-34-98-87	Stein R and Wu, S	1998	Tolerance enforcement method for parent RH-2485 in pome fruit Rohm and Haas Company,
Tr-36-96-88	Wu, S, Desai, TB and Hofman, CK	1996	Tolerance enforcement residue analytical method for RH-2485 in whole cottonseed and its processed fractions (meal, hull, refined oil and gin trash), Rohm and Haas Company,