FENPYROXIMATE (193)

First draft prepared by Dr Weili Shan, Residues Division, Institute for Control of Agrochemicals, Ministry of Agriculture, Beijing, China

EXPLANATION

Fenpyroximate was evaluated by JMPR in 1995 for the first time and then in 1999. The 1995 JMPR allocated an ADI of 0–0.01 mg/kg bw based on the NOAEL for reduced body weight gain in a 2-year study in rats. In 2004, the JMPR established an ARfD of 0.01 mg/kg bw based on the LOAEL of 2 mg/kg bw per day for the induction of diarrhoea at the beginning of a 13-week study of toxicity in dogs. In 2007, the JMPR re-evaluated a new study of acute toxicity in dog and established an ARfD of 0.02 mg/kg bw based on the NOAEL of 2 mg/kg bw.

The 1999 JMPR concluded that the residue definition for compliance with the MRL and for estimation of dietary intake, both for animal and plant commodities should be fenpyroximate and recommended the maximum residue levels for apples, grapes, hops, oranges, cattle kidney, cattle liver, cattle meat and cattle milk.

Following the establishment of an ARfD of 0.02 mg/kg, the Fortieth-Session of the CCPR decided to advance the MRL for apples to Step 8 and to retain the MRL for grapes at Step 7, pending a review of alternative GAP by JMPR 2010.

The present meeting received information on the residue analysis, storage stability, use pattern, supervised field trial, fate of residues during processing of citrus, grape and tomato. The supervised field trial information included data on citrus, cantaloupe, cucumber, tomato, bell and non-bell pepper, apple and pear and tree nuts.

The residue data of supervised trials on grapes conducted in southern EU is also submitted to support a review of alternative GAP by JMPR 2010.

RESIDUE ANALYSIS

Analytical methods

The Meeting received four multi-residue analytical methods for the determination of residues of fenpyroximate in plant, plant products, food stuff and feeding stuff. The primary methods (Brown 2006 and DFG S19), with minor modifications are briefly summarised below. The DFG method was described in the 1995 evaluation of fenpyroximate. Table 1 provides method validation and concurrent recoveries and LOQs submitted to the present Meeting.

Reference:	Bacher, R. (2005,) A-4062
Commodities	apples, grapes, whole orange and cotton seed
Analytes:	fenpyroximate
LOQ:	0.01 mg/kg
Determination:	LC/MS/MS
Description:	The analytical method was based on the modular multi residue enforcement method L 00.00-34 of the Official Collection of Test Methods (§35 LMBG) (DFG S19) with some modifications. Extraction module E 1 was used for apple and grape. Extraction module E 3 was applied to whole orange. Extraction module E 7 was used for cotton seed with acetonitrile/acetone (225:25 v/v), addition of synthetic calcium silicate (Calflo E). Clean-up used gel permeation chromatography module GPC. The analysis is performed by LC/MS/MS.

Reference: Brown, D. (2006,) A-4064
Commodities Apples, strawberries, peaches, pears, plums, beans, cucumbers, peppers and tomatoes
Analytes: fenpyroximate and its Z-isomer M-1
LOQ: typically 0.01 mg/kg
Determination: LC/MS/MS
Description Homogenised samples were extracted by maceration with ethyl acetate. Following centrifugation of the mixture, an aliquot was taken and transferred to a glass vial together with a drop of octanol to act as a keeper. The solvent was evaporated to dryness in a dri-block at 40 □ using nitrogen. The residue was then redissolved in methanol and quantified using LC-MS-MS.

Reference: Klimmnek, S and Klimmek A. (2007) A-4068
Commodities: Apples
Analytes fenpyroximate and its metabolite M-1
LOQ: 0.005 mg/kg
Determination: LC/MS/MS
Description: The applicability of the DFG Methods S 19 (extended and revised version) for the determination of the residues of fenpyroximate and its metabolite M-1 in apples was tested. Specimen material is extracted with acetone. The evaporation residue of an aliquot of the organic phase is cleaned up by gel permeation chromatography. The purified extract of apple is analysed for residues of fenpyroximate and its metabolite M-1 by LC-MS/MS.

Reference: Hill, J. T. (2009)
Commodities: Apples, citrus, cotton, hops, grapes, peppers and tomato, okra, cantaloupe and cucumber
Analytes: fenpyroximate and its metabolite M-1
LOQ: 0.005 mg/kg
Determination: GC-NPD
Description: The analysis procedure for the extraction and quantitation of fenpyroximate and M-1 was based on DFG Method S19, and optimized for the determination of fenpyroximate and M-1 in the crops listed above using the listed extraction procedures. The samples were extracted with acetone and cleaned using gel permeation chromatography (GPC) followed by silica gel solid phase extraction (SPE). Analysis is by GC-NPD.

Table 1 Summary of the results for the validation of fenpyroximate analytical methods in plant materials

Reference (Author, Year)	Matrix	Fortification level (mg/kg)	Range of recovery (%)	Overall Mean recovery (%)	Overall Standard deviation	RSD %
A-4062 Bacher, R. 2005	Apples	0.025(n = 5)	97-98	98	6	6.1
		0.25(n = 5)	99-99			
	grapes	0.025 (n = 5)	102-102	100	5.5	5.5
		0.25 (n = 5)	99-100			
	Cotton seed	0.025 (n = 5)	93-95	94	6	6.4
		0.25 (n = 5)	92-95			
	oranges	0.01(n = 5)	91-93	92	5.5	6.0
		0.1(n = 5)	91-92			
A-4064 Brown, D. 2006	***Fenpyroximate***					
	Apple	0.01 (n = 5)	91-96	92	3.9	4.2
		0.1 (n = 5)	83-97			
	Strawberry	0.01 (n = 5)	89-97	93	2.5	2.7
		0.1 (n = 5)	91-96			
	Peach	0.01 (n = 5)	100-104	100	4.3	4.3

Reference (Author, Year)	Matrix	Fortification level (mg/kg)	Range of recovery (%)	Overall Mean recovery (%)	Overall Standard deviation	RSD %
		0.1 (n = 5)	93-101			
	Pear	0.01 (n = 5)	92-98	94	2.9	3.1
		0.1 (n = 5)	90-96			
	Plum	0.01 (n = 5)	100-106	100	3.5	3.5
		0.1 (n = 5)	97-98			
	Bean	0.01 (n = 5)	83-85	84	1.3	1.6
		0.1 (n = 5)	84-87			
	Cucumber	0.01 (n = 5)	92-94	92	1.6	1.8
		0.1 (n = 5)	89-91			
	Pepper	0.01 (n = 5)	86-91	90	3.1	3.4
		0.1 (n = 5)	88-93			
	Tomato	0.01 (n = 5)	87-99	92	4.3	4.6
		0.1 (n = 5)	90-95			
	M-1					
	Apple	0.01 (n = 5)	94-100	95	3.3	3.4
		0.1 (n = 5)	88-98			
	Strawberry	0.01 (n = 5)	96-100	94	4.7	5.0
		0.1 (n = 5)	88-93			
	Peach	0.01 (n = 5)	88-90	85	4.8	5.7
		0.1 (n = 5)	77-85			
	Pear	0.01 (n = 5)	92-95	92	3.4	3.7
		0.1 (n = 5)	86-94			
	Plum	0.01 (n = 5)	89-97	89	5.0	5.6
		0.1 (n = 5)	84-86			
	Bean	0.01 (n = 5)	82-89	86	2.3	2.7
		0.1 (n = 5)	84-88			
	Cucumber	0.01 (n = 5)	90-91	89	1.6	1.7
		0.1 (n = 5)	87-88			
	Pepper	0.01 (n = 5)	83-85	86	2.8	3.3
		0.1 (n = 5)	84-90			
	Tomato	0.01 (n = 5)	87-94	88	3.2	3.6
		0.1 (n = 5)	85-87			
A-4068 Klimmek, S. and Klimmek, A. 2007	Fenpyroximate					
	Apples m/z:366	0.005(n = 5)	86-100	102	8.3	8.1
		0.05(n = 5)	93-108			
	Apples m/z:138	0.005(n = 5)	90-126	103	11	11
		0.05(n = 5)	93-110			
	M-1					
	Apples m/z:366	0.005(n = 5)	96-118	107	6.5	6.1
		0.05(n = 5)	101-115			
	Apples m/z:138	0.005(n = 5)	90-110	104	7.2	6.9
		0.05(n = 5)	105-113			
Hill, J. T. 2009	fenpyroximate					
	hops	LOQ:0.05		114		
	grapes	LOQ:0.05		85		
	peppers	LOQ:0.05		110		
	cantaloupe	LOQ:0.05		117		
	M-1					
	hops	LOQ:0.05		80		
	grapes	LOQ:0.05		90		
	peppers	LOQ:0.05		110		
	cantaloupe	LOQ:0.05		106		

Samples of plant origin

The present meeting also received the analytical methods of fenpyroximate and M-1 in citrus, cantaloupes, tomatoes, peppers, pears, grapes, almond and mint in the corresponding supervised residue trial study. The results are summarised below, including the commodities, for which the

methods were validated, analytes and their limit of quantitation (LOQ), determination technique and a brief description of the method. Recoveries are shown in Table 2.

Reference:	Barney, W.P., 2003 (R-4156)
Commodities:	Orange RAC, orange Juice, orange dry pulp, orange oil
Analyte:	Fenpyroximate and M-1
LOQ:	0.02
Determination:	GC/NPD
Description:	Water and acetone was added into sample, which was homogenised with tissumizer. After adding ethyl acetate/cyclohexane (1:1), the top organic layer was decanted. The extract was purified using silica SPE cartridge.

Reference:	Carringer, S.J., 1997 (R-4107)
Commodities:	Orange RAC, orange oil, orange dry pulp
Analyte:	Fenpyroximate and M-1
LOQ:	0.02
Determination:	GC/NPD
Description:	The method was based on DFG Method S19 and validated for analysis of whole fruit, orange oil, and dried pulp by adding known concentrations to control samples and analysing for fenpyroximate and its metabolite M-1 within an analytical set.

Reference:	Brown, D., 2002
Commodities:	Cucumbers
Analyte:	Fenpyroximate and M-1
LOQ:	0.01
Determination:	GC-MS
Description:	Extracted by acetone and purified by liquid-liquid partition, evaporated to dryness and then re-dissolved in cyclohexane/ethyl acetate.

Reference:	Bullock, S., 2003
Commodities:	Cucumbers
Analyte:	Fenpyroximate and M-1
LOQ:	0.01
Determination:	LC-MS/MS
Description:	Extracted by ethyl acetate followed by centrifugation. The extract was then evaporated to dryness and re-dissolved in methanol.

Reference:	Barney, W.P., 2007 (R-4195)
Commodities:	Cantaloupes
Analyte:	Fenpyroximate
LOQ:	0.05
Determination:	GC/NPD
Description:	Extracted from samples using acetone/water, and then rotary evaporated. The flask was rinsed with 5% sodium chloride, then partitioned twice with dichloromethane. The sample was cleaned up on activated Florisil followed by a carbon SPE Column.

Reference:	Barney, W.P., 2008 (R-4196)
Commodities:	Tomato fruit, tomato paste, tomato puree
Analyte:	fenpyroximate and M-1
LOQ:	0.05
Determination:	LC-MS/MS
Description:	Fenpyroximate and M-1 residues were extracted from samples using acetone/water (4:1, v/v). The volume of the final extract was adjusted so as to

be within the calibration range for instrument analysis.

Reference: Barney, W.P., 2007 (R-4194)
Commodities: Peppers
Analyte: Fenpyroximate
LOQ: 0.05
Determination: GC/NPD
Description: Fenpyroximate residues are extracted from samples using acetone/water, and then rotary evaporated. The flask was rinsed with 5% sodium chloride, then partitioned twice with dichloromethane. Dichloromethane was evaporated to dryness. The sample was cleaned up on activated Florisil followed by a carbon SPE Column.

Reference: Willard, T.R., 2002 (R-4154) and Stewart, E. R., 2006 (R-4201)
Commodities: Pears
Analyte: Fenpyroximate and M-1
LOQ: 0.05
Determination: GC-NPD
Description: Fenpyroximate and M-1 residues were extracted from pears by blending with acetone. An aliquot of the ethyl acetate: cyclohexane extract was subjected to a cleanup step incorporating a silica gel minicolumn cleanup.

Reference: Willard, T.R., 2002 (R-4155)
Commodities: Grapes
Analyte: Fenpyroximate and M-1
LOQ: 0.01
Determination: LC-MS/MS.
Description: The method involves extraction in ethyl acetate in the presence of anhydrous sodium sulphate. An aliquot is taken, evaporated to near dryness and redissolved in methanol prior to quantitation by LC-MS/MS.

Reference: Willard, T.R., 2002 (R-4155)
Commodities: Almond
Analyte: Fenpyroximate and M-1
LOQ: 0.05
Determination: GC/NPD
Description: Fenpyroximate and M-1 residues were extracted from nutmeats and hulls by blending with acetone.

The results of above methods validation were summarised in Table 2.

Table 2 Recoveries of fenpyroximate and M-1 in fortified plant materials and the processed commodities

Reference (Author, Year)	Matrix	Fortification level (mg/kg)	Range of recovery (%)	Overall Mean recovery (%)	Overall Standard deviation	RSD %
R-4156 Barney,W.P. 2003	M-1 plus fenpyroximate					
	Orange RAC	0.02 (n=3)	107-110	105.2	4.4	4.1
		0.2 (n=3)	101-102			
	Orange Juice	0.02 (n=3)	79.5-84.5	77.7	8.3	10.7
		0.2 (n=3)	61.1-80.9			
	Orange Dry Pulp	0.02 (n=3)	79.5-114	95.7	13.3	13.9
		0.2 (n=3)	84.9-108			
	Orange Oil	0.02 (n=3)	79.5-114	85.7	17.1	20.0
		0.2 (n=3)	68.0-81.8			

Reference (Author, Year)	Matrix	Fortification level (mg/kg)	Range of recovery (%)	Overall Mean recovery (%)	Overall Standard deviation	RSD %
R-4107 Carringer,S.J. 1997	Fenpyroximate					
	Orange RAC	0.05 (n=3)	83-100	110.4	16.5	14.9
		0.25 (n=3)	108-120			
		0.5 (n=3)	104-135			
	Orange dried pulp	0.05 (n=3)	114-144	125.2	18.5	14.8
		0.25 (n=3)	96-153			
		0.5 (n=3)	104-135			
	Orange oil	0.05 (n=3)	94-138	122.2	20.4	16.7
		0.25 (n=3)	127-154			
		0.5 (n=3)	101-125			
	M-1					
	Orange RAC	0.05 (n=3)	80-88	85.3	5.2	6.1
		0.25 (n=3)	76-88			
		0.5 (n=3)	88-92			
	Orange dried pulp	0.05 (n=3)	48-65	76.2	22.4	29.4
		0.25 (n=3)	65-117			
		0.5 (n=3)	73-100			
	Orange oil	0.05 (n=3)	112-132	96.1	20.0	20.8
		0.25 (n=3)	81-94			
		0.5 (n=3)	70-86			
Bullock, S., 2003	Fenpyroximate					
	cucumber	0.01 (n=2)	77-101	92.0	12.7	13.8
		0.05 (n=1)	86			
		0.1 (n=1)	104			
	M1					
	cucumber	0.01 (n=2)	81-85	86.0	9.0	10.5
		0.05 (n=1)	79			
		0.1 (n=1)	99			
R-4195 Barney, W.P. 2007	Fenpyroximate (with MV, CR, SSCR)					
	cantaloupe	0.05 (n=14)	96-133	111.8	13.1	11.7
		0.50 (n=6)	95-108			
		5.00 (n=3)	93-106			
R-4196 Barney, W.P. 2008	Fenpyroximate (with MV, CR, SSCR)					
	Tomato Fruit	0.05 (n=26)	92-121	106.1	5.7	5.4
		0.50 (n=4)	103-106			
		5.00 (n=3)	109-111			
	Tomato Paste	0.05 (n=7)	85-107	104.1	7.8	7.5
		0.50 (n=4)	102-109			
		5.00 (n=3)	112-114			
	Tomato Puree	0.05 (n=7)	97-111	106.1	4.2	4.0
		0.50 (n=4)	102-106			
		5.00 (n=3)	106-111			
	M-1 (with MV, CR, SSCR)					
	Tomato Fruit	0.05 (n=26)	77-114	98.8	7.4	7.5
		0.50 (n=4)	95-100			
		5.00 (n=3)	103-104			
	Tomato Paste	0.05 (n=7)	79-102	96.0	8.5	8.8
		0.50 (n=4)	93-96			
		5.00 (n=3)	106-106			
	Tomato Puree	0.05 (n=7)	87-105	98.8	5.7	5.8
		0.50 (n=4)	94-97			
		5.00 (n=3)	103-106			
R-4194 Barney,W.P. 2007	Fenpyroximate (with MV, CR, SSCR)					
	Pepper	0.05 (n=10)	108-125	113.7	9.3	8.1
		0.10 (n=12)	94-141			
		0.50 (n=6)	100-119			
		5.00 (n=3)	98108			

Reference (Author, Year)	Matrix	Fortification level (mg/kg)	Range of recovery (%)	Overall Mean recovery (%)	Overall Standard deviation	RSD %
R-4154 Willard, T.R. 2002	Fenpyroximate					
	Pear	0.05 (n=4)	105-117	98.6	18.2	18.5
		0.5 (n=4)	59-103			
		5.0 (n=4)	95-108			
	M-1					
	Pear	0.05 (n=4)	81-93	82.0	20.8	25.4
		0.5 (n=4)	29-93			
		5.0 (n=4)	88-104			
R-4201 Stewart, E.R. 2006	Fenpyroximate					
	Pear	0.05 (n=3)	104-122	104.5	11.8	11.3
		5.0 (n=3)	88-104			
	M-1					
	Pear	0.05 (n=3)	92-98	94.5	4.7	5.0
		5.0 (n=3)	87-99			
R-4155 Willard,T.R. 2002	Fenpyroximate					
	Almond Nutmeat	0.05(n=4)	86-97	87.5	9.2	10.5
		0.5 (n=4)	76-98			
		5.0 (n=4)	77-99			
	Almond Hulls	0.05(n=4)	95-112	103.9	8.0	7.7
		0.5 (n=4)	98-109			
		5.0 (n=4)	103-120			
	M-1					
	Almond Nutmeat	0.05(n=4)	74-81	83.3	9.0	10.7
		0.5 (n=4)	75-91			
		5.0 (n=4)	78-103			
	Almond Hulls	0.05(n=4)	72-73	85.9	13.4	15.6
		0.5 (n=4)	78-88			
		5.0 (n=4)	95-113			
	Fenpyroximate (fortified control samples analysed with each field sample analytical)					
	Almond Nutmeat	0.05(n=7)	88-93	93.3	6.8	7.3
		2.5 (n=1)	98			
		5.0 (n=4)	86-108			
	Almond Hulls	0.05(n=2)	109-109	105.5	8.5	8.1
		0.5 (n=2)	109-114			
		5.0 (n=2)	95-97			
	M-1 (fortified control samples analysed with each field sample analytical)					
	Almond Nutmeat	0.05(n=7)	79-91	88.5	7.5	8.5
		2.5 (n=1)	91			
		5.0 (n=4)	83-105			
	Almond Hulls	0.05(n=2)	73-74	82.8	11.5	13.9
		0.5 (n=2)	74-95			
		5.0 (n=2)	88-93			
R-4155 Willard, T.R. 2002	Fenpyroximate					
	Grape	0.01 (n=2)	83-110	96.8	13.3	13.7
		0.5 (n=2)	88-106			
	M-1					
	Grape	0.01 (n=2)	76-109	95.0	17.1	18.0
		0.5 (n=2)	85-110			

Storage stability tests

The Meeting received the new data of fenpyroximate storage stability in citrus, cantaloupe, tomato, pepper, pear, grape in the corresponding supervised residue trial study. All of the storage stability trial results summarised in table 3.

Concurrent recoveries for orange RAC, juice, dry pulp and oil were 88.3–99.6%, 51.8–82.3%, 66.6–106%, 66.3–79.9%, respectively indicated that the fenpyroximate is stable under frozen storage

in orange RAC for up to 167 days, in orange juice for up to 221 days, in orange dry pulp for up to 202 days and in orange oil for up to 203 days.

Concurrent recoveries for fenpyroximate and M-1 were 102 and 86%, respectively. Recovery data for fenpyroximate and M-1 were 108–109% and 96–99%. The result indicated that fenpyroximate and M-1 are stable for up to 100 days in stored pear samples.

The residues were found to be stable under frozen storage in grape RAC for up to 268 days, raisins for up to 195 days and raisin waste for up to 195 days. The wet and dry pomace demonstrated some degradation of the fenpyroximate/M-1 residues over the 177 days of frozen storage. Fenpyroximate and M-1 were found to be instable in grape juice over the period of 165 days frozen storage, with only 16% of the residues recovered.

The results of 95–108% concurrent recoveries and 101–110% recoveries indicated that fenpyroximate is stable for up to 12 months in cantaloupe.

The result of 109 ± 9% concurrent recoveries and 110 ± 4% recoveries indicated that fenpyroximate is stable for up to 403 days in pepper fruit.

The result of 95–109% concurrent recoveries and 90–96% recoveries indicated that fenpyroximate is stable under frozen storage in tomato whole fruit for up to 567 days, in tomato paste for up to 529 days and in tomato puree for up to 532 days.

Table 3 Summary of storage stability of total residue recovery in plant

Matrix	Storage Interval (days)	Fortification Level (mg/kg)	Residue Found (mg/kg)	Procedural (Concurrent) Recovery	Reference
Orange RAC	0	0.20	0.169	--	R4156
	95	0.20	0.161	96.6	
	167	0.20	0.171	88.7	
Orange Juice	0	0.20	0.212	--	
	95	0.20	0.136	69.4	
	221	0.20	0.168	66.8	
Orange dry pulp	0	0.20	0.143	--	
	61	0.20	0.188	103	
	202	0.20	0.125	74.3	
Orange oil	0	0.20	0.145	--	
	61	0.20	0.158	78.8	
	203	0.20	0.125	70.1	
Cantaloupe	364	0.50	0.530	103	R4195
Grape RAC	0	0.10	0.088	--	R4121
	31	0.10	0.089	89	
	91	0.10	0.097	103	
	268	0.10	0.060	72	
Grape Juice	0	0.10	0.082	--	R4122
	165	0.10	0.011	68	
Grape Dry pomace	0	0.10	0.081	--	
	177	0.10	0.057	81	
Grape Wet pomace	0	0.10	0.079	--	
	177	0.10	0.073	97	
Grape Raisins	0	0.10	0.075	--	
	195	0.10	0.092	114	
Grape Raisin Waste	0	0.10	0.090	--	
	195	0.10	0.103	101	
Pepper	403	0.50	0.55	109	R4194
Pear	0	0.50	0.51	--	R4154
	100	0.50	0.54	114	
Tomato whole fruit	567	0.50	0.53	103	R4196
Tomato paste	529	0.50	0.51	109	
Tomato puree	532	0.50	0.54	106	

USE PATTERN

Fenpyroximate is a non-systemic selective acaricide for the control of immature and adult stages of spider mites. It is registered in many countries around the world, mainly for the control of European red mites (*Panonychus ulmi*) and two-spotted mite (*Tetranychus urticae*) in citrus fruits, pome fruits, grapes, cucurbits, tomatoes, peppers, tree nuts and hops.

Information of registration on approved uses of fenpyroximate for citrus, pome fruits, grapes, cucurbits, fruiting vegetable other than cucurbits and tree nuts is shown in Table 4.

Table 4 Approved uses of fenpyroximate on citrus and other fruits, vegetables and tree nuts

Crop	Country	Form.	Application				PHI, days
			Method	Rate kg ai/ha	Spray conc., kg ai/hL	Number	
Citrus	USA	EC	Foliar spray	0.11-0.22, max 0.45	0.024	1-4	14
Citrus	Greece	SC	Foliar spray	0.080-0.160		1	14
Citrus	Italy	SC	Foliar spray		0.0051	1	30
Citrus	Portugal	SC	Foliar spray	0.053-0.08	0.0053-0.008	1	14
Orange Grapefruit Mandarin Lemon Limes	Spain	SC	Foliar spray	0.1-0.2	0.005-0.01	1	14
Citrus	Japan	SC	Foliar spray	0.05-0.35	0.0025-0.005	1	14
Cucumber	USA	EC	Foliar spray	max 0.112	0.03	1-2(G)	7
Cucumber	Germany	SC	Foliar spray	0.046	0.008	1	3
Cucumber	Italy	SC	Foliar spray		0.008-0.0103	1	14
Cucumber	Poland	SC	Foliar spray	0.015-0.1		2(G)	7
Cucumber	Japan	SC	Foliar spray	0.0375-0.075	0.0025	1	1
Melon	USA	EC	Foliar spray	0.117, max 0.22	< 0.156	1-2	3
Melon Watermelon	Japan	SC	Foliar spray	0.0375-0.15	0.0025-0.005	1	1
Fruiting vegetable, other than Cucurbit	USA	EC	Foliar spray	0.11, max 0.22	< 0.156	1-2(F/G)	1
Tomato	Italy	SC	Foliar spray		0.008-0.0103	1(F/G)	14
Tomato	Poland	SC	Foliar spray	0.015-0.1		2(G)	7
Tomato	Romania	SC	Foliar spray	0.05		1	1
Tomato	Spain	SC	Foliar spray	0.01-0.2	0.005-0.01	1(F/G)	3
Tomato	Japan	SC	Foliar spray	0.02-0.12	0.002-0.004	1	1
Pepper	Italy	SC	Foliar spray		0.008-0.0103	1(F/G)	14
Pepper	Romania	SC	Foliar spray	0.05		1	1
Sweet pepper	Japan	SC	Foliar spray	0.0375-0.075	0.0025	1	1
Pome fruits	USA	EC	Foliar spray	0.056-0.11, max 0.117	0.03	1-2	14
Pome fruits	Austria	SC	Foliar spray	0.051		1	21
Pome fruits	Czech	SC	Foliar spray	0.025	0.0025	1	21
Pome fruits	Hungary	SC	Foliar spray	0.035-0.05		1	4
Pome fruits	Spain	SC	Foliar spray	0.1-0.2		1	7
Apple	Belgium	SC	Foliar spray	0.04-0.075		1	7
Apple	Denmark	SC	Foliar spray	0.107		1	14
Apple	France	SC	Foliar spray	0.08-0.12		1	21
Apple	Germany	SC	Foliar spray	0.0384	0.008	1	21
Apple	Greece	SC	Foliar spray	0.075-0.1		1	7
Apple	Italy	SC	Foliar spray		0.005-0.007	1	28
Apple	Poland	SC	Foliar spray	0.05 0.063-0.075		2 2	30 7
Apple	Portugal	SC	Foliar spray	0.053-0.08	0.0053-0.008	1	14
Apple	Slovakia	SC	Foliar spray	0.05-0.064		1	14

Crop	Country	Form.	Application				PHI, days
			Method	Rate kg ai/ha	Spray conc., kg ai/hL	Number	
Apple	UK	SC	Foliar spray	0.103	0.005-0.010	1	14
Apple	Japan	SC	Foliar spray	0.05-0.35	0.0025-0.005	1	14
Pear	Belgium	SC	Foliar spray	0.05		1	7
Pear	Denmark	SC	Foliar spray	0.107		1	14
Pear	Germany	SC	Foliar spray	0.0384	0.008	1	21
Pear	Hungary	SC	Foliar spray	0.035-0.05		1	4
Pear	Italy	SC	Foliar spray		0.005-0.0067	1	14
Pear	Poland	SC	Foliar spray	0.05		2	7
Pear	Portugal	SC	Foliar spray	0.053-0.08	0.0053-0.008	1	14
Pear	Japan	SC	Foliar spray	0.05-0.35	0.0025-0.005	1	7
Tree nuts Incl. almond and pistachios	USA	EC	Foliar spray	0.088-0.234, max 0.45	< 0.06	1-2	14
Grapes					< 0.06		
Grapes	USA	EC	Foliar spray	0.058-0.117, max 0.117		1-2	14
Grapes	Italy	SC	Foliar spray		0.0051	1	28
Grapes	Hungary	SC	Foliar spray	0.05		1	14
Grapes	Slovakia	SC	Foliar spray	0.05	0.005	2	21
Grapes	Romania	SC	Foliar spray	0.025		1	14
Grapes	Germany	SC	Foliar spray	0.03-0.123	0.008	1	35
Grapes	Portugal	SC	Foliar spray	0.053-0.08	0.0053-0.008	1	14
Grapes	Spain	SC	Foliar spray	0.1-0.2	0.005-0.01	1	14
Grapes	Japan	SC	Foliar spray	0.05-0.35	0.0025-0.005	1	14

G: glasshouse use

Max: Do not apply more than the rate (kg ai/ha) per growing season.

RESIDUES RESULTING FROM SUPERVISED TRIALS ON CROPS

Relevant data from supervised trials on oranges, apples, grapes and hops evaluated by the 1995 and 1999 JMPR, were interpreted in the light of current GAP and the Meeting received new supervised residue trials data for fenpyroximate in table 5 which represented citrus fruits, pears, grapes, fruiting vegetables other than cucurbits, fruiting vegetables, cucurbits, tree nuts and almond hulls.

Table 5 Fenpyroximate- supervised residue trials

Group	Crop	Table No
Citrus fruits	Oranges	6
	Lemons	7
	Grapefruit	8
Pome fruits	Pears	9
Berries and other small fruit	Grapes	10
Fruiting vegetables, Cucurbits	Cucumbers	11
	Cantaloupe	12
Fruiting vegetables, other than Cucurbits	Tomatoes	13
	Peppers	14
Tree nuts	Almonds, walnuts and pecans	15
	Almond hulls	16

Trials were generally well documented with laboratory and field reports. Most trial designs used non-replicated plots and field reports provided information on the sprayers used, plot sizes, field sample sizes and sampling dates. Laboratory reports included method validations with procedural recoveries from spiking at residue concentrations similar to those occurring in samples from supervised trials. Dates of analyses or duration of residue sample storage were also provided. Although trials included control plots, no control data are recorded in the tables except where residues in control samples exceeded the LOQ.

Application rates were reported as fenpyroximate. Residue concentrations were reported for fenpyroximate and in some cases included its isomer, Z-fenpyroximate (M-1). Unquantifiable residues are shown as < LOQ. Residues below 1 mg/kg, application rates below 1 kg ai/ha and spray concentrations have been rounded to two significant figures. Residue concentrations are recorded unadjusted for recoveries or for residue values in control samples. Where replicate samples were taken from a single plot, individual results are reported, among which the highest result is used for estimation of maximum residue level. Where results from separate plots with distinct characteristics such as different varieties or treatment schedule were reported, results are listed for each plot. Where replicate analyses were conducted, the individual values are not reported and the mean of the values is shown.

Residues from the trials conducted according to maximum GAP have been used for the estimation of maximum residue levels and they are underlined.

Citrus fruits

The Meeting received two new residue reports on citrus. A total of 21 field trials were conducted in US. Ten trials were conducted on oranges in 1994 and 2001, five trials on lemons and 6trials on grapefruits. All 21 trials involved two applications at 14 days intervals of the EC or SC formulation containing 50 g/L fenpyroximate at a rate of 0.22–0.025 kg g ai/ha. Replicate samples were taken from a treated plot of a minimum of 4 trees. Storage intervals ranged from 79 to 132 days for the fruit RACs and were 210 days for juice, 196 days for orange pulp and 191 days for orange oil in Trial R-4156. Storage intervals ranged from 447 to 541 days for whole fruit; 442 to 455 days for juice; 454 or 470 days for dried pulp and 454 or 469 days for orange oil.

Two analytical methods were validated with analyses by spiking control samples with fenpyroximate at fortification levels ranging from 0.02 to 0.2 mg/kg and from 0.05 to 0.5. The limit of quantification (LOQ) was 0.02 mg/kg. In Trial R-1456, recoveries of fenpyroximate in whole orange ranged from 101 to 110%; in juice from 61 to 84%; in dry pulp from 85 to 108% and in orange oil from 68 to 114%. In Trial Report R-4107, recoveries in whole fruit ranged from 70 to 116%; in juice were 78 and 120%; in dry pulp were 91% and in orange oil were 96 and 98%.

Table 6 Fenpyroximate residues in oranges from supervised trials in the USA

ORANGE	Form	Application					Residues, mg/kg			Reference
Location year (variety)		kg ai/ha	kg ai/hL	Water L/ha	No	PHI days	Fenpyr.	Z-isomer	Matrix/sample	
US GAP		0.22			1-2	14				
		Not exceeding 0.47kg ai/ha per growing season								
US/FL 2001 (Navel)	EC	0.45	0.087 0.087	1689	1	0 7 14 21	0.15, 0.13 0.12, 0.14 0.12, 0.08 0.09, 0.09	0.006,0.004 0.03, 0.02 0.03, 0.03 0.07, 0.07		R-4156 (01-418-01) Replicate samples
US/FL 2001	EC	0.45	0.12 0.12	2250	1	14	0.13, 0.10	0.02, 0.01		R-4156 (01-418-02)

ORANGE Location year (variety)	Form	Application kg ai/ha	kg ai/hL	Water L/ha	No	PHI days	Residues, mg/kg Fenpyr.	Z-isomer	Matrix/sample	Reference
(Pineapple)		0.89	0.23 0.23	2254	1	14	0.148, 0.168 < 0.02, < 0.02 0.96, 1.22 0.84, 0.92	0.017, 0.027 < 0.02, < 0.02 0.27, 0.26 0.20, 0.22	RAC Juice Dry pulp Oil	
US/FL 2001 (Navel)	EC	0.44	0.11 0.11	2167	1	14	0.08, 0.14	0.01, 0.02		R-4156 (01-418-03)
US/FL 2001 (Hamlin)	EC	0.45	0.072 0.072	1412	1	14	0.24, 0.24	0.07, 0.09		R-4156 (01-418-04)
US/FL 2001 (Hamlin)	EC	0.45	0.066 0.066	1290	1	14	0.22, 0.24	0.06, 0.07		R-4156 (01-418-05)
US/TX 2001 (N-33)	EC	0.45	0.12 0.12	2365	1	14	0.07, 0.05	0.02, 0.02		R-4156 (01-418-06)
US/FL 1994 (Hamlin)	SC	0.25 0.26	0.130 0.144	4692 4722	2	14	0.04, 0.07	< 0.008(2)		R-4107 (AA940422. FL1)
		0.25 0.26	0.130 0.144	4754 4999	2	14	< 0.008(2)	< 0.008(2)	Juice	
US/FL2 1994 (Hamlin)	SC	0.22 0.25	0.114 0.130	4466 4616	2	14	0.07, 0.18	< 0.008(2)		R-4107 (AA940422. FL2)
		0.50 0.50	0.280 0.274	4860 4752	2	14	0.246, 0.467 < 0.008 0.009 4.67 1.69	0.018, 0.022 < 0.008 < 0.008 0.220 0.146	Fruit Juice Molasses Oil Dry pulp	
US/CA3 1994 (Atwoods)	SC	0.25 0.25	0.136 0.133	4820 4728	2	14	0.08, 0.11	< 0.008(2)		R-4107 (AA940422. CA3)
		0.25 0.26	0.130 0.144	4754 4999	2	14	< 0.008(2)	< 0.008(2)	Juice	
US/CA4 1995 (Navel)	SC	0.25 0.25	0.133 0.133	4647 4756	2	14	0.25, 0.28	< 0.008(2)		R-4107 (AA940422. CA4)
		0.50 0.49	0.273 0.269	4738 4764	2	14	0.452, 0.387 < 0.008 0.032 30.9 2.22	< 0.008(2) < 0.008 < 0.008 < 0.008 0.046	RAC Juice Molasses Oil Dry pulp	

LOQ for fenpyroximate = 0.02 mg/kg; for Z-isomer = 0.008 mg/kg.

Table 7 Fenpyroximate residues in lemons from supervised trials in the USA

LEMONS Location year (variety)	Form	Application kg ai/ha	kg ai/hL	Water L/ha	No	PHI days	Residues, mg/kg Fenpyroximate	M-1	Reference
US GAP		0.22			1-2	14			
		Not exceeding 0.45kg ai/ha per growing season							
US/CA 2001 (Prior)	EC	0.45	0.11 0.11	2091	1	14	0.08, 0.09	0.01, 0.01	R-4156 (01-418-07)
US/FL 2001 (Bearss)	EC	0.45	0.076 0.076	1474	1	14	0.11, 0.09	0.03, 0.02	R-4156 (01-418-08)
US/AZ 1994 (Limonera)	SC	0.23 0.25	0.120 0.133	4440 4709	2	14	0.17, 0.13	< 0.008, < 0.008	R-4107 (AA940422.AZ)

LEMONS	Form	Application					Residues, mg/kg		Reference
Location year (variety)		kg ai/ha	kg ai/hL	Water L/ha	No	PHI days	Fenpyroximate	M-1	
US/CA 1994 (Pryor)	SC	0.25 0.26	0.135 0.145	4793 4913	2	14	0.12, 0.23	＜0.008, < 0.008	R-4107 (AA940422.CA1)
US/CA 1994 (Lisbon)	SC	0.25 0.26	0.131 0.139	4654 4799	2	14	0.14, 0.21	＜0.008, < 0.008	R-4107 (AA940422. CA2)

LOQ for fenpyroximate = 0.02 mg/kg; for Z-isomer = 0.008 mg/kg.

Table 8 Fenpyroximate residues in grapefruits from supervised trials in the USA

GRAPEFRUITS	Form	Application				PHI, days	Residues, mg/kg		Reference
Location, year (variety)		kg ai/ha	kg ai/hL	Water, L/ha	No.		Fenpyroximate	M-1	
US GAP (max)		0.22			1-2	14			
		Not exceeding 0.45kg ai/ha per growing season							
US/FL 2001 (White Marsh)	EC	0.45	0.067 0.067	1297	1	14	0.14, 0.15	0.03, 0.03	R-4156 (01-418-09)
US/FL 2001 (Ruby Red)	EC	0.45	0.12 0.12	2254	1	14	0.07, 0.10	0.01, 0.02	R-4156 (01-418-10)
US/AZ 2001 (Rio Red)	EC	0.46	0.066 0.066	1256	1	14	0.04, 0.03	0.02, 0.02	R-4156 (01-418-11)
US/TX1 1994 (Rio Red)	SC	0.25 0.25	0.133 0.133	4719 4704	2	14	0.04, 0.04	＜0.008, < 0.008	R-4107 (AA940422. TX1)
US/CA5 1994 (Mello Gold)	SC	0.25 0.25	0.133 0.133	4692 4722	2	14	0.06, 0.09	＜0.008, < 0.008	R-4107 (AA940422. CA5)
US/FL3 1994 (White Marsh)	SC	0.25 0.25	0.130 0.130	4621 4621	2	14	0.02, 0.02	＜0.008, < 0.008	R-4107 (AA940422. FL3)

LOQ for fenpyroximate = 0.02 mg/kg; for Z-isomer = 0.008 mg/kg.

Pome fruits

The Meeting received residue trials on apples and pears.

EU trials for apples were conducted in Southern France, Italy, Spain, Germany, Greece and the UK. The LOQ is 0.01 mg/kg for fenpyroximate and it's Z-isomer, with recoveries ranging from 90 to 100% with fortification at 0.01, 0.1 and 0.2 mg/kg.

Three field trials of EC formulation containing 50 g/L fenpyroximate for pears were conducted in US. Two trials of SC formulation containing 50 g/L fenpyroximate were conducted in France. All five trials conducted in one application at 14 days intervals at a rate of 0.11 kg g ai/ha.

The analytical method was validated with analyses by spiking control samples with fenpyroximate at fortification levels ranging from 0.05 to 0.5 mg/kg, with recoveries ranging from 95 to 117%. The limit of quantification (LOQ) was 0.05 mg/kg for fenpyroximate as well as Z-isomer. Samples were stored between 41 to 96 days.

Table 9 Fenpyroximate residues in apples from supervised field trials in the EU

Apple	Form.	Application				Sample	PHI	Residues (mg/kg		Reference
Trial Site, year (variety		kg ai/ha	g ai/100L	Volume L/ha	No.			Fenpyroximate	Z-isomer	R-4161
EU GAP for apples: 8 g ai/100L (France) 21 days; 5 to 7 g ai/100L (Italy) 28 days; 5 to 10 g ai/100L (UK) 14 days.										
France, 2001 (Granny Smith)	5 SC		5	1480	1	Apple	0	0.05	< 0.01	AF/6100/NN/1
							3	0.05	< 0.01	
							7	0.04	< 0.01	
							10	0.04	< 0.01	
							14	0.02	< 0.01	
Italy, 2001 (Fuji)	5 SC		5	1447	1	Apple	0	0.04	< 0.01	AF/6100/NN/3
							3	0.02	< 0.01	
							7	0.02	< 0.01	
							10	0.01	< 0.01	
							14	< 0.01	< 0.01	
Italy, 2001 (Double red)	5 SC		5	1401	1	Apple	10	0.01	< 0.01	AF/6100/NN/4
							14	0.02	< 0.01	
France, 2006 (Canada)	5 SC		12.1	1035	1	Apple	42*	0.02	< 0.01	R-4185 AF/11088/NN/1
							56	0.01	< 0.01	
France, 2006 (Golden)	5 SC		12.05	993	1	Apple	0	0.04	< 0.01	AF/11088/NN/2
							14	0.05	< 0.01	
							21	0.04	< 0.01	
							42	0.03	< 0.01	
							56	0.02	< 0.01	
Germany 2006 (Elstar)	5 SC		8.03	1490	1	Apple	42*	0.01	< 0.01	AF/11088/NN/4
							56	0.01	< 0.01	
Germany 2006 (Gloser)	5 SC		8.03	1487	1	Apple	0	0.09	< 0.01	AF/11088/NN/5
							14	0.09	< 0.01	
							21	0.03	< 0.01	
							42*	0.04	< 0.01	
							56	0.04	< 0.01	

* Normal commercial harvest

Table 10 Fenpyroximate residues in pears from supervised trials in the US and France

PEAR	Form	Application				PHI, days	Residues, mg/kg		Reference
Location, year (variety)		kg ai/ha	kg ai/hL	Water, L/ha	No.		Fenpyroximate	M-1	
US GAP (max)		0.056-0.11			1-2	14			
		Not exceeding 0.11 kg ai/ha per growing season							
US/CA 2005 (Asian)	EC	0.11	0.012	886	1	4 9 14 19 24	0.111, 0.084 0.064, 0.044 0.029, 0.026 0.032, 0.052 0.026, 0.043	< 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05	R-4201 (CA-17A1)
	EC	0.11	0.012	886	1	14	< 0.05, < 0.05	< 0.05, < 0.05	
	EC	0.45	0.046	883	1	14	0.195, 0.250	0.095, 0.113	
US/CA 2005 (Bartlett)	EC	0.11	0.012	893	1	14	0.070, 0.101	< 0.05, < 0.05	R-4201 (CA-17A2)
	EC	0.45	0.048	897	1	14	0.345, 0.265	0.05, < 0.05	

PEAR Location, year (variety)	Form	Application kg ai/ha	kg ai/hL	Water, L/ha	No.	PHI, days	Residues, mg/kg Fenpyroximate	M-1	Reference
US/WA 2005 (Concord)	EC	0.11	0.012	894	1	14	0.052, < 0.05	< 0.05, 0.032	R-4201 (WA-17A)
	EC	0.45	0.048	895	1	14	0.249, 0.155	0.146, 0.092	
US/CA 2001 (Shinko)	EC	0.45	0.049	944	1	14	0.082, 0.064	< 0.05, < 0.05	R-4154 (CA1)
	SC	0.45	0.049	948	1	14	0.073, 0.071	< 0.05, < 0.05	
US/CA 2001 (Bosc)	EC	0. 45	0.047	675	1	14	0.131, 0.119	< 0.05, < 0.05	R-4154 (CA2)
US/NY 2001 (Bartlett)	EC	0.45	0.048	938	1	14	0.319, 0.232	0.074, 0.069	R-4154 (NY1)
US/OR 2001, (Red Anjou)	EC	0.45	0.049	949	1	14	0.185, 0.149	< 0.05, < 0.05	R-4154 (OR1)
	SC	0.45	0.049	949	1	14	0.173, 0.185	< 0.05, < 0.05	
US/OR 2001 (Cascade)	EC	0.45	0.049	933	1	0 7 14 21 28	0.356, 0.387 0.212, 0.214 0.152, 0.175 0.134, 0.127 0.148, 0.150	< 0.05, < 0.05 0.062, 0.069 0.054, 0.053 0.056, < 0.05 < 0.05, 0.053	R-4154 (OR2)
US/WA 2001 (Bartlett)	EC	0.45	0.049	964	1	14	0.245, 0.199	< 0.05, 0.064	R-4154 (WA1)
	SC	0.45	0.049	966	1	14	0.252, 0.273	< 0.05, < 0.05	
France 2006 (Crassane)	SC	0.048	0.096	1493	1	0 14 21 42 56	0.08 0.04 0.04 0.02 0.02	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01	R-4185 (AF/11088/NN/3)
France, 2001 (Comice)	SC		0.05	1476	1	10	0.03	< 0.01	R-4161 (AF/6100/NN/2)
						14	0.02	< 0.01	

Grapes

The Meeting received new residue trials on grapes. Eight field trials of SC formulation containing 50 g/L fenpyroximate were conducted in EU. All eight trials involved a single application at 28 days intervals at a spray concentration of 5 g ai/100L.

The analytical method was validated with analyses by spiking control samples with fenpyroximate at fortification levels ranging from 0.01 to 0.5 mg/kg, with recoveries of fenpyroximate ranging 83 to 110%. Samples were stored between 186 and 234 days in trial R-4205 and between 12 and 50 days in trial R-4219. The limit of quantification (LOQ) was 0.01 mg/kg.

Table 11 Fenpyroximate residues in grapes from supervised trials in Italy, France and Spain,

GRAPES Location, year (variety)	Form	Application kg ai/ha	kg ai/hL	Water, L/ha	No.	PHI days	Residues, mg/kg Fenpyroximate	M-1	Reference
Italy GAP (max)			0.0051		1	28			
Italy 2008 (Barbera)	SC	0.0512	0.0051	1004	1	28	< 0.01	< 0.01	R-4205 (S08-02423)
France	SC	0.0522	0.0051	1024	1	0	0.08	< 0.01	R-4205

GRAPES Location, year (variety)	Form	Application kg ai/ha	kg ai/hL	Water, L/ha	No.	PHI days	Residues, mg/kg Fenpyroximate	M-1	Reference
2008 (Meriot)						7	0.04	< 0.01	(S08-02423-02)
						14	0.07	< 0.01	
						21	0.04	< 0.01	
						28	0.05	< 0.01	
Spain 2008 (Garrido Fino)	SC	0.0515	0.0051	1009	1	28	< 0.01	< 0.01	R-4205 (S08-02423-03)
Spain 2008 (Garnacha)	SC	0.0511	0.0051	1002	1	0	0.08	< 0.01	R-4205 (S08-02423-05)
						7	0.08	< 0.01	
						14	0.05	< 0.01	
						21	0.05	< 0.01	
						28	0.03	< 0.01	
Italy 2009 (Sangiovese)	SC	0.05	0.0051	981.2	1	28	0.01	< 0.01	R-4219 (S09-02663-01)
France 2009 (Tammat)	SC	0.0544	0.0051	1067	1	0	0.12	< 0.01	R-4219 (S09-02663-02)
						7	0.11	< 0.01	
						14	0.11	< 0.01	
						21	0.07	< 0.01	
						28	0.05	< 0.01	
Sinarcas, Valencia, Spain, 2009 (Bobal)	SC	0.0538	0.0051	1055	1	28	0.02	< 0.01	R-4219 (S09-02663-03)
Spain 2009 (Monastrell)	SC	0.0544	0.0051	1067	1	0	0.03	< 0.01	R-4219 (S09-02663-04)
						7	0.05	< 0.01	
						14	0.03	< 0.01	
						21	0.02	< 0.01	
						28	0.02	< 0.01	
						29	0.02	< 0.01	

Cucumbers

The Meeting received nine residue trials on cucumbers conducted in EU on protected crops or crops under cover.

The analytical method for cucumbers was validated with analyses by spiking control samples with fenpyroximate at fortification levels ranging from 0.01 to 0.2 mg/kg. The LOQ was 0.01 mg/kg, with recoveries ranging from 74 to 104%.

Table 12 Fenpyroximate residues in cucumbers from supervised trials in EU

CUCUMBER Location, year (variety)	Form	Application kg ai/ha	kg ai/hL	Water, L/ha	No.	PHI, days	Residues, mg/kg Fenpyroximate	M-1	Reference
GAP (max)		0.11			1-2	7			Greenhouse
		Not exceeding 0.11 kg ai/ha per growing season							
Cucumber for fresh consumption									
France, 2001 (Defence)	SC	0.109	0.0102	1059	1	0 3 7 10	0.03 0.02 0.02 < 0.01	< 0.01 < 0.01 < 0.01 < 0.01	R-4202 (AF/6097/NN/2) Protected crop
France, 2001 (1976 Bruisma)	SC	0.103	0.0102	1004	1	7 10	0.02 < 0.01	< 0.01 < 0.01	R-4202 (AF/6097/NN/3) Protected crop
Italy, 2001, (Dorina)	SC	0.107	0.0102	1047	1	7 10	< 0.01 < 0.01	< 0.01 < 0.01	R-4202 (AF/6097/NN/4) Protected crop
Spain, 2002 (N/D)	SC	0.104	0.0102	1010	1	0 3 7	0.04 0.01 < 0.01	< 0.01 < 0.01 < 0.01	R-4203 (AF/6779/NN/1) Protected crop

CUCUMBER Location, year (variety)	Form	Application kg ai/ha	 kg ai/hL	 Water, L/ha	 No.	PHI, days	Residues, mg/kg Fenpyroximate	 M-1	Reference
						10	< 0.01	< 0.01	
UK, 2002 (Amaada)	SC	0.105	0.0102	1025	1	0 3 7 10	0.03 0.02 < 0.01 < 0.01	< 0.01 < 0.01 < 0.01 < 0.01	R-4203 (AF/6779/NN/2) Protected crop
UK, 2002 (Aviance)	SC	0.110	0.0101	1069	1	0 3 7 10	0.04 0.03 0.02 < 0.01	< 0.01 < 0.01 < 0.01 < 0.01	R-4203 (AF/6779/NN/3) Protected crop
UK, 2002 (Korinda)	SC	0.090	0.0102	881	1	7 10	< 0.01 < 0.01	< 0.01 < 0.01	R-4203 (AF/6779/NN/4) Protected crop
Spain, 2002 (Dona)	SC	0.103	0.0102	1000	1	7 10	< 0.01 < 0.01	< 0.01 < 0.01	R-4203 (AF/6779/NN/5) Protected crop
France, 2002 (Beluga)	SC	0.103	0.0102	1008	1	7 10	0.01 < 0.01	< 0.01 < 0.01	R-4203 (AF/6779/NN/6) Protected crop

Eight trials on melons were conducted in the US in accordance with the US GAP of two applications at 2–4 days intervals at a rate of 0.117 kg ai/ha and not exceeding 0.22 kg g ai/ha per growing season.

The analytical method for melons was validated with analysed by spiking control samples with fenpyroximate at fortification levels ranging from 0.05 to 5 mg/kg and recoveries ranging from 93 to 133% (mean recovery of 112%). The LOQ was 0.05mg/kg.

Table 13 Fenpyroximate residues in melons from supervised trials in the USA

MELON Location, year (variety)	Form	Application kg ai/ha	 kg ai/hL	 Water, L/ha	 No.	PHI, days	Residues, mg/kg Fenpyroximate	Reference
US GAP (max)		0.11			1-2	3		
		Not exceeding 0.22 kg ai/ha per growing season						
US/OH 2005 (Aphrodite)	EC	0.11 0.11	0.006 0.006	475 465	2	3	< 0.05, < 0.05	R-4195 (-OH*06)
US/GA 2005 (Hale's Best Jumbo)	EC	0.11 0.11	0.004 0.004	287 287	2	2	< 0.05, < 0.05	R-4195 (-GA*06)
US/TX 2005 (Mission)	EC	0.11 0.11	0.004 0.004	292 310	2	3	< 0.05, < 0.05	R-4195 (-TX*12)
US/TX 2005 (Cruiser)	EC	0.11 0.11	0.004 0.004	329 301	2	4	< 0.05, < 0.05	R-4195 (-TX*13)
US/CA 2005 (Laredo)	EC	0.11 0.11	0.004 0.004	267 270	2	1 3 7 13 21	< 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05	R-4195 (-CA41)
US/NM 2005 (Topmark SR)	EC	0.11 0.11	0.005 0.005	369 361	2	3	< 0.05, < 0.05	R-4195 (-NM08)

MELON Location, year (variety)	Form	Application kg ai/ha	 kg ai/hL	 Water, L/ha	 No.	PHI, days	Residues, mg/kg Fenpyroximate	Reference
US/NM 2005 (Hymark)	EC	0.11 0.11	0.004 0.004	283 281	2	2	< 0.05, < 0.05	R-4195 (-CA42)
US/CA 2005 (Tomark)	EC	0.11 0.11	0.005 0.005	361 353	2	2	< 0.05, < 0.05	R-4195 (-CA43)

Tomatoes

The Meeting received 19 residue trials on tomatoes conducted in the US in accordance with the US GAP of two applications at a rate of 0.11 kg ai/ha and a PHI of 1 day for greenhouse tomatoes, nine residue trials on tomatoes conducted in EU in accordance with the Spain GAP of one treatment at a application rate of 0.2 kg ai/ha with a PHI of 3 days.

The analytical method for tomatoes was validated with analyses by spiking control samples with fenpyroximate at fortification levels ranging from 0.05 to 5 mg/kg and recoveries ranging from 92 to 121% for whole fruit; 85 to 114% in tomato paste; 97 to 111% in tomato puree. The LOQ was 0.05 mg/kg. Samples of whole fruit, paste and puree were stored for periods up to 626, 547 and 546 days, respectively.

Table 14 Fenpyroximate residues in tomatoes from supervised trials in the USA

TOMATO Location year (variety)	Form	Application kg ai/ha	 kg ai/hL	 Water, L/ha	 No.	PHI, days	Residues, mg/kg Fenpyroximate	 M-1	Reference
US GAP (max)		0.11			1-2	1			
		Not exceeding 0.22 kg ai/ha per growing season							
Field trials									
US/NY 2005 (Mariana)	EC	0.11 0.11	0.002 0.003	182 191	2	1	< 0.05, < 0.05	< 0.05, < 0.05	R-4196 (NY03)
	EC	0.22 0.23	0.005 0.005	355 373	2	1	0.13 0.09 0.05	- - -	Fruit Paste Puree
US/FL 2005 (Solarsett)	EC	0.11 0.12	0.004 0.004	272 280	2	1 3 7 14 21	0.07, 0.07 < 0.05, < 0.05 < 0.05, < 0.05 < 0.05, 0.05 < 0.05, < 0.05	< 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05	R-4196 (FL11)
TUS/GA 2005 (Amelia)	EC	0.11 0.11	0.006 0.006	433 429	2	1	0.11, 0.06	< 0.05, < 0.05	R-4196 (GA*05)
US/FL 2005 (FL47)	EC	0.12 0.11	0.004 0.004	277 272	2	1	0.09, 0.08	< 0.05, < 0.05	R-4196 (FL12)
US/NM 2005 (Celebrity VFN)	EC	0.11 0.11	0.003 0.003	222 218	2	0 1 3 7 13	0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05	< 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05	R-4196 (NM06)
US/CA 2005 (Ace 55 VF)	EC	0.11 0.11	0.004 0.004	267 267	2	1	< 0.05, < 0.05	< 0.05, < 0.05	R-4196 (CA30)
US/ NM 2005 (Cal-Ace)	EC	0.14 0.14	0.010 0.010	610 610	2	1	0.06, 0.05	< 0.05, < 0.05	R-4196 (NM07)
US/CA	EC	0.11	0.005	360	2	1	0.05, 0.05	< 0.05, < 0.05	R-4196

TOMATO	Form	Application				PHI,	Residues, mg/kg		Reference
Location year (variety)		kg ai/ha	kg ai/hL	Water, L/ha	No.	days	Fenpyroximate	M-1	
2005 (Boscat)		0.11	0.005	360					(CA31)
US/CA 2005 (Boscat)	EC	0.11 0.11	0.005 0.005	357 364	2	1	<u>< 0.05</u>, < 0.05	< 0.05, < 0.05	R-4196 (CA32)
US/CA 2005 (#9997)	EC	0.11 0.11	0.003 0.003	247 249	2	1	<u>0.08</u>, 0.08	< 0.05, < 0.05	R-4196 (CA33)
US/CA 2005 (#9997)	EC	0.11 0.11	0.003 0.003	240 245	2	1	<u>0.07</u>, < 0.05	< 0.05, < 0.05	R-4196 (CA34)
US/CA 2005 (Shady Lady)	EC	0.11 0.11	0.003 0.003	266 274	2	1	<u>< 0.05</u>, < 0.05	< 0.05, < 0.05	R-4196 (CA35)
US/CA 2005 (AB-2)	EC	0.11 0.11	0.004 0.004	266 266	2	1	<u>0.05</u>, < 0.05	< 0.05, < 0.05	R-4196 (CA36)
	EC	0.22 0.23	0.007 0.007	536 544	2	1	0.09 0.04 0.04	- - -	Fruit Paste Puree
US/CA 2005 (Quality 21)	EC	0.11 0.12	0.003 0.003	229 237	2	1	<u>< 0.05</u>, < 0.05	< 0.05, < 0.05	R-4196 (CA38)
Greenhouse trials									
US/FL 2005 (FL47)	EC	0.11 0.11	0.003 0.003	263 260	2	1	<u>0.14</u>, 0.07	< 0.05, < 0.05	R-4196 (FL13)
US/TX 2005 (Mariachi RZ)	EC	0.11 0.11	0.006 0.006	414 414	2	1	<u>0.08</u>, 0.07	< 0.05, < 0.05	R-4196 (TX08)
US/CO 2005 (Trust F1)	EC	0.12 0.11	0.004 0.004	281 271	2	1	<u>0.08</u>, 0.07	< 0.05, < 0.05	R-4196 (CO07)
Small Fruited trials									
US/OH 2005 (Cupid)	EC	0.11 0.11 0.11	0.006 0.006 0.006	426 459 445	3	1	<u>< 0.05</u>, < 0.05	< 0.05, < 0.05	R-4196 (OH*04)
US/CA 2005 (Cherry Grande)	EC	0.11 0.11	0.005 0.005	353 367	2	1	<u>0.12</u>, 0.11	0.06, < 0.05	R-4196 (CA37)

Table 15 Fenpyroximate residues in tomato from supervised trials in EU

TOMATO	Form	Application				PHI,	Residues, mg/kg		Reference
Location, year (variety)		kg ai/ha	kg ai/hL	Water, L/ha	No.	days	Fenpyroximate	M-1	
Spain GAP (max)		0.1-0.2			1	3			
Field trials									
Greece 2001 (Titano)	SC	0.103	0.0102	1004	1	0 3 7 10	0.01 <u>0.02</u> 0.02 0.02	< 0.01 < 0.01 < 0.01 < 0.01	R-4178 AF/6094/NN/1
Greece 2001 (Volcano)	SC	0.101	0.0103	980	1	7 10	0.02 0.02	< 0.01 < 0.01	R-4178 AF/6094/NN/2
Spain 2001 (Malpica)	SC	0.103	0.0102	1006	1	0 3 7 10	0.08 <u>0.04</u> 0.04 0.04	< 0.01 < 0.01 < 0.01 < 0.01	R-4178 AF/6094/NN/3

TOMATO Location, year (variety)	Form	Application kg ai/ha	kg ai/hL	Water, L/ha	No.	PHI, days	Residues, mg/kg Fenpyroximate	M-1	Reference
Spain 2001 (Avalon)	SC	0.107	0.0102	1048	1	7 10	0.05 0.05	< 0.01 < 0.01	R-4178 AF/6094/NN/4
Spain 2002 (Mina)	SC	0.1025	0.0102	1000	1	0 3 7 10 14	0.01 0.02 < 0.01 < 0.01 0.01	< 0.01 < 0.01 < 0.01 < 0.01	R-4181 AF/6782/NN/1
Spain 2002 (H-9036 DG)	SC	0.1025	0.0103	995	1	0 3 7 10 14	0.07 0.04 0.05 0.03 0.04	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01	R-4181 AF/6782/NN/3
Spain 2002 (H-9036)	SC	0.1025	0.0103	997	1	7 10	0.04 0.03	< 0.01 < 0.01	R-4181 AF/6782/NN/4
France 2002 (Rio Crande)	SC	0.1025	0.0102	1003	1	7 10	0.02 0.01	< 0.01 < 0.01	R-4181 AF/6782/NN/5
Greenhouse trials									
Spain 1990 (Alex)	SC	0.103	0.005	2000	1	0 3 7 14	0.04 0.03 0.03 0.02	< 0.01 < 0.01 < 0.01 < 0.01	R-4038
	SC	0.1545	0.008	2000	1	0 3 7 14	0.04 0.04 0.02 0.02	< 0.01 < 0.01 < 0.01 < 0.01	R-4039
UK 2001 (Solution)	SC	0.104	0.0102	1016	1	0 3 7 10	0.03 0.04 0.02 0.03	< 0.01 < 0.01 < 0.01 < 0.01	R-4179 AF/6095/NN/1
UK 2001 (Cussack)	SC	0.102	0.0102	998	1	7 10	0.10 0.08	< 0.01 < 0.01	R-4179 AF/6095/NN/2
France 2001 (Petula)	SC	0.102	0.0103	993	1	0 3 7 10	0.02 0.04 0.06 0.03	< 0.01 < 0.01 < 0.01 < 0.01	R-4179 AF/6095/NN/3
France 2001 (Cecilia)	SC	0.102	0.0102	998	1	7 10	0.02 0.04	< 0.01 < 0.01	R-4179 AF/6095/NN/4
Italy 2001 (Incas)	SC	0.105	0.0102	1027	1	7 10	0.08 0.09	< 0.01 < 0.01	R-4179 AF/6095/NN/4
UK 2002 (Solution)	SC	0.097	0.0102	950	1	0 3 7 10	0.06 0.04 0.03 0.03	< 0.01 < 0.01 < 0.01 < 0.01	R-4180 AF/6781/NN/1
Spain 2002 (Josefina)	SC	0.105	0.0103	1023	1	0 3 7 10	< 0.01 0.09 0.06 0.07	< 0.01 < 0.01 < 0.01 < 0.01	R-4180 AF/6781/NN/2
UK 2002 (Shirley)	SC	0.095	0.0103	926	1	7 10	0.06 0.07	< 0.01 < 0.01	R-4180 AF/6781/NN/3
Spain,2002 (Josefina)	SC	0.112	0.0103	1090	1	7 10	0.08 0.11	< 0.01 < 0.01	R-4180 AF/6781/NN/4

Peppers

The Meeting received 16 residue trials on peppers conducted in US in accordance with the US GAP of two applications at 1 day intervals at a rate of 0.11 kg ai/ha and a PHI of 1 day.

The analytical method for peppers was validated with analyses by spiking control samples with fenpyroximate at fortification levels ranging from 0.05, 0.1, 0.5 to 5 mg/kg, with recoveries ranging from 94 to 110%. The LOQ was 0.05 mg/kg. Samples of peppers were stored for up to 396 days.

Table 16 Fenpyroximate residues in peppers from supervised trials in the USA

PEPPER	Form	Application				PHI,	Residues, mg/kg	Reference
Location, year (variety)		kg ai/ha	kg ai/hL	Water, L/ha	No.	days	Fenpyroximate	
US GAP (max)		0.11			1-2	1		
		Not exceeding 0.22 kg ai/ha per growing season						
Field trials								
US/WI 2005 (Bell pepper: Bellboy)	EC	0.12 0.11	0.006 0.006	421 413	2	1	< 0.05, < 0.05	R-4194 (WI04)
US/FL 2005 (Bell pepper: Capistrano)	EC	0.11 0.12	0.005 0.006	396 412	2	1	< 0.05, 0.058	R-4194 (FL15)
US/TX 2005 (Bell pepper: Capistrano)	EC	0.11 0.12	0.005 0.005	373 379	2	1	0.056, 0.075	R-4194 (TX11)
US/NC 2005 (Bell pepper: Heritage)	EC	0.11 0.11 0.11	0.005 0.005 0.005	384 377 384	3	0 1 3 7 12	0.093, 0.095 0.133, 0.120 0.098, 0.110 0.099, 0.096 0.094, 0.070	R-4194 (NC04)
US/TN 2005 (Bell pepper: California Wonder Sweet)	EC	0.12 0.11 0.12	0.005 0.005 0.006	383 383 391	3	1	< 0.05, 0.05	R-4194 (TN05)
US/FL 2005 (Bell pepper: Capistrano)	EC	0.12 0.11	0.006 0.005	416 396	2	1	0.074, 0.067	R-4194 (FL16)
US/CA 2005 (Bell pepper: Wizard)	EC	0.11 0.11	0.007 0.007	525 510	2	1	< 0.05, < 0.05	R-4194 (CA39)
US/CA 2005 (Bell pepper: Indria)	EC	0.11 0.11	0.005 0.006	405 407	2	1	< 0.05, < 0.05	R-4194 (CA40)
US/OH 2005 (Non-Bell pepper: Sahuaro)	EC	0.11 0.11	0.006 0.006	438 438	2	1	< 0.05, < 0.05	R-4194 (OH05)
US/TX 2005 (Non-Bell pepper: Tam Veracruz)	EC	0.11 0.12	0.005 0.005	379 385	2	1	< 0.05, < 0.05	R-4194 (TX09)
US/FL 2005 (Non-Bell pepper: Mitla)	EC	0.11 0.12	0.006 0.006	408 416	2	1	0.11, 0.12	R-4194 (FL14)
US/NC 2005 (Non-Bell pepper:	EC	0.11 0.11	0.005 0.005	384 388	2	1	0.057, 0.050	R-4194 (NC05)

PEPPER Location, year (variety)	Form	Application kg ai/ha	kg ai/hL	Water, L/ha	No.	PHI, days	Residues, mg/kg Fenpyroximate	Reference
Aruba)								
US/NM 2005 (Non-Bell pepper: Joe E. Parker)	EC	0.11 0.11	0.006 0.006	447 447	2	1 3 7 14	< 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05	R-4194 (NM09)
Greenhouse trials								
US/NJ 2005 (Bell pepper: King Arthur)	EC	0.11 0.12	0.009 0.010	683 710	2	1	0.068, 0.069	R-4194 (NJ09)
US/TX 2005 (Bell pepper: Capistrano)	EC	0.11 0.12	0.006 0.006	418 422	2	1	< 0.05, < 0.05	R-4194 (TX10)
US/CO 2005 (Non-Bell pepper: DRH 7118F1)	EC	0.11 0.11	0.006 0.006	448 457	2	1	0.056, 0.052	R-4194 (CO08)

Tree nuts

The Meeting received five residue trials on almonds, three trials on walnuts and five trials on pecans conducted in US at 2× the US GAP rate.

The analytical method for tree nuts was validated with analyses by spiking control samples with fenpyroximate at fortification levels ranging from 0.05, 0.5 to 5 mg/kg, with recoveries ranging 86 to 108% for nutmeat. The LOQ was 0.05 mg/kg for nutmeat and hulls. Samples of nutmeat were stored up to 230 days.

Table 17 Fenpyroximate residues in nutmeat of almonds, walnuts and pecans from supervised trials in the USA

Tree nuts (nutmeat) Location, year (variety)	Form	Application kg ai/ha	kg ai/hL	Water, L/ha	No.	PHI, days	Residues, mg/kg Fenpyroximate	M-1	Reference
US GAP (max)		0.084-0.22			1-2	14			
		Not exceeding 0.45 kg ai/ha per growing season							
Almonds									
US/CA 2001 (Mission)	EC	0.45	0.05	944	1	14	< 0.05, < 0.05	< 0.05, < 0.05	R-4155 (CA1)
US/CA 2001 (Carmel)	EC	0.45	0.05	935	1	14	< 0.05, < 0.05	< 0.05, < 0.05	R-4155 (CA2)
US/CA 2001 (Carmel)	EC	0.45	0.05	926	1	14	< 0.05, < 0.05	< 0.05, < 0.05	R-4155 (CA3)
US/CA 2001 (Mission)	EC	0.45	0.05	926	1	14	< 0.05, < 0.05	< 0.05, < 0.05	R-4155 (CA4)
US/CA 2001 (Prices)	EC	0.45	0.05	935	1	0 7 14 21 28	< 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05	< 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05 < 0.05, < 0.05	R-4155 (CA5)
Walnuts									
US/CA 2001	EC	0.45	0.05	926	1	14	< 0.05, < 0.05	< 0.05, < 0.05	R-4155 (CA6)

Tree nuts (nutmeat)	Form	Application				PHI, days	Residues, mg/kg		Reference
Location, year (variety)		kg ai/ha	kg ai/hL	Water, L/ha	No.		Fenpyroximate	M-1	
(Serr)									
US/CA 2001 (Tulare)	EC	0.44	0.05	944	1	14	< 0.05, < 0.05	< 0.05, < 0.05	R-4155 (CA7)
US/CA 2001 (Chandler)	EC	0.45	0.05	954	1	14	< 0.05, < 0.05	< 0.05, < 0.05	R-4155 (CA8)
Pecans									
US/FL 2001 (Stuart)	EC	0.45	0.05	916	1	14	< 0.05, < 0.05	< 0.05, < 0.05	R-4155 (FL1)
US/GA 2001 (Sumner)	EC	0.45	0.05	935	1	14	< 0.05, < 0.05	< 0.05, < 0.05	R-4155 (GA1)
US/GA 2001 (Stuart)	EC	0.45	0.05	954	1	14	< 0.05, < 0.05	< 0.05, < 0.05	R-4155 (GA2)
US/LA 2001 (Melrose)	EC	0.46	0.05	972	1	14	< 0.05, < 0.05	< 0.05, < 0.05	R-4155 (LA1)
US/TX 2001 (Stuart)	EC	0.45	0.05	916	1	14	< 0.05, < 0.05	< 0.05, < 0.05	R-4155 (TX1)

Animal feed commodities

Almond hulls

The Meeting received 5 residue data on almond hulls from trials conducted on almonds in US at 2 times US GAP

The analytical method for almond hulls was validated with analyses by spiking control samples with fenpyroximate at fortification levels ranging from 0.05, 0.5 to 5 mg/kg and recoveries ranging from 94 to 114% for almond hulls. Samples were stored for up to 146 days. The LOQ was 0.05 mg/kg.

Table 18 Fenpyroximate residues in almond hulls from supervised trials in the USA

ALMOND (hull)	Form	Application				PHI, days	Residues, mg/kg		Reference
Location year (variety)		kg ai/ha	kg ai/hL	Water, L/ha	No.		Fenpyroximate	M-1	
US GAP (max)		0.084-0.22			1-2	14			
		Not exceeding 0.45 kg ai/ha per growing season							
US/CA 2001 (Mission)	EC	0.45	0.05	944	1	14	0.547, 0.559	0.215, 0.191	R-4155 (CA1)
US/CA 2001 (unknown)	EC	0.45	0.05	935	1	14	0.998, 1.13	0.277, 0.312	R-4155 (CA2)
US/CA 2001 (unknown)	EC	0.45	0.05	926	1	14	0.871, 1.14	0.178, 0.224	R-4155 (CA3)
US/CA 2001 (unknown)	EC	0.45	0.05	926	1	14	0.871, 1.14	0.256, 0.285	R-4155 (CA4)
US/CA 2001 (unknown)	EC	0.45	0.05	935	1	0 7 14 21	1.12, 1.10 1.16, 0.961 0.355, 0.305 0.642, 0.740	0.090, 0.079 0.286, 0.247 0.129, 0.118 0.232, 0.225	R-4155 (CA5)

ALMOND (hull)	Form	Application				PHI, days	Residues, mg/kg		Reference
Location year (variety)		kg ai/ha	kg ai/hL	Water, L/ha	No.		Fenpyroximate	M-1	
						28	0.248, 0.296	0.117, 0.135	

FATE OF RESIDUES IN STORAGE AND PROCESSING

In processing

The Meeting received information on the fate of incurred residues of fenpyroximate during the processing of citrus, grapes, and tomatoes.

Oranges

In three trials in USA, oranges were treated with two applications of EC or SC formulation containing 50 g/L fenpyroximate at a rate of 0.45 for EC and 0.50 kg ai/ha for SC per application. The fruits were harvested 14 days after the last treatment.

In processing two trials were involved. In one trial the harvested samples were processed using the FMC orange processing method. Processed samples were stored frozen at the analytical laboratory until they were processed and then re-frozen until sub-sampling for analysis. All Samples except for orange oil and orange juice were ground using a cutter/mixer with dry ice. Orange oil and juice sample were not processed and stored frozen for up to 7 months before analysed.

In another trial, the harvested samples were processed using the Brown processing method. Processing began one to four days after receipt of the samples at each processing facility. Whole fruit were processed into the following fractions: oil, juice, dried pulp, and molasses. Processing samples were frozen at -12 to -2 ºF on the day of collection. Orange oil and juice sample were not processed and stored frozen for up to 16 months before analysed.

Table 19 Fenpyroximate residues in orange and its processed commodities from supervised trials in the USA

ORANGE		Application					Residues mg/kg	Commodities	PF	Reference
Location year (variety)	Form	kg ai/ha	kg ai/hL	Water L/ha	No.	PHI days				
Myakka city FL, 2001 (Pineapple)	EC	0.45 0.45	0.23 0.23	1116 1116	2	14	0.158 < 0.02 1.09 0.88	RAC Orange juice Dry pulp Orange oil	 < 0.13 6.9 5.1	R-4156
Palm Beach FL, 1994 (Hamlin)	SC	0.50 0.50	0.280 0.274	4954 4822	2	14	0.356 < 0.008 0.009 1.69 4.67	RAC Orange juice Molasses Dry pulp Orange oil	 < 0.022 0.025 4.7 13.1	R-4107
Tulare CA 1995 (Navel)	SC	0.50 0.49	0.273 0.269	4773 4749	2	14	0.420 < 0.008 0.032 2.22 30.9	RAC Orange juice Molasses Dry pulp Orange oil	 < 0.019 0.076 5.3 73.6	R-4107

Grape

In one trial in USA, grapes were treated with one applications of EC formulation containing 50 g/L fenpyroximate at a rate of 1.12 kg ai/ha. The grapes were harvested 14 days after treatment. A portion of grapes was dried to yield raisins and raisin waste.

Processing was conducted using typical commercial methods. Processed samples were stored frozen at the analytical laboratory for up to 195 days before analysis by GC/NPD. The processed fraction of grape was extracted with a mixture of acetone and water adding Celite as a filter aide. The resultant extract was vacuum filtered and the filtrate was partitioned with dichloromethane. The organic extract was then dried over sodium sulfate and concentrated to near dryness. The residue was partitioned with ethyl acetate twice and the ethyl acetate residue was purified by GPC, followed by silica gel chromatography.

Table 20 Fenpyroximate residues in grapes and its processed commodities from supervised trials in the USA

GRAPE		Application					Residues mg/kg	Commodities	PF	Reference
Location year (variety)	Form	kg ai/ha	kg ai/hL	Water L/ha	No.	PHI days				
W. Dakota CA 1999 (Mariana)	EC	1.12	0.005 0.005	355 373	1	14	0.446 < 0.05 1.251 4.266 1.212 1.580	Grapes Juice Wet pomace Dry pomace Raisins Raisin waste	 < 0.11 2.8 9.6 2.7 3.5	R-4196

Tomato

In two trials in USA, tomatoes were treated with two applications of EC formulation containing 50 g/L fenpyroximate at a rate of 0.22 kg ai/ha. The tomatoes were harvested 1day after treatment. Samples were delivered ambient to the processing facility. Chopped product (pulp) is pumped through a heat exchanger at 200–206 ºC. Hot break pulp is fed through a pulp press. The pulp press is then fitted with a screen and collected juice. Juice is concentrated by vacuum evaporation into puree and paste.

In three trials conducted in South Europe, tomatoes were treated with one applications of SC formulation containing 50 g/L fenpyroximate at a rate of 0.1025 kg ai/ha. The tomatoes were harvested 7day after treatment.

Hardly any fenpyroximate residues in processing commodities were higher than LOQ. The Meeting didn't consider such data for processing factor estimation for tomato.

Table 21 Fenpyroximate residues in tomato and its processed commodities from supervised trials in the USA

TOMATO		Application					Residues mg/kg	Commodities	PF	Reference
Location year (variety)	Form	kg ai/ha	kg ai/hL	Water L/ha	No.	PHI days				
Freeville, NY 2005 (Mariana)	EC	0.22 0.23	0.005 0.005	355 373	2	1	0.13 0.09 0.05	Fruit Paste Puree	 0.69 0.38	R-4196
Davis, CA 2005 (AB-2)	EC	0.22 0.23	0.007 0.007	536 544	2	1	0.09 0.04 0.04	Fruit Paste Puree	 0.44 0.44	R-4196

The resulting processing factors are summarised in Table 22.

Table 22 Processing factors and STMR-Ps for oranges, grapes, tomatoes and their processed commodities

Commodity	Processed fraction	Calculated processing factor	Processing factor (mean)
Orange	RAC		
	Juice	< 0.13, < 0.021, < 0.019	0.13
	Dry pulp	5.1, 4.7, 5.3	5.1
Grape	RAC		
	Juice	< 0.11	< 0.11
	Wet pomace	2.8	2.8
	Dry pomace	9.6	9.6
	Raisins	2.7	2.7
Tomato	Paste	0.69, 0.44	0.56
	Puree	0.38, 0.44	0.41

APPRAISAL

Fenpyroximate was evaluated by JMPR in 1995 for the first time and then again in 1999. The 1995 JMPR allocated an ADI of 0–0.01 mg/kg bw. The 2007 JMPR established an ARfD of 0.02 mg/kg.

The 1999 JMPR concluded that the residue definition for compliance with the MRL and for estimation of dietary intake, both for animal and plant commodities should be fenpyroximate and recommended the maximum residue levels for apples, grapes, hops, oranges, cattle kidney, cattle liver, cattle meat and cattle milk.

Following the establishment of an ARfD of 0.02 mg/kg, the Fortieth CCPR decided to advance the MRL for apples to Step 8. Because of acute intake concern, the MRL for grapes was retained at Step 7.

The Meeting received information on the residue analysis, storage stability, use patterns, supervised field trials and fates of residues during processing of citrus, grapes and tomatoes. The supervised field trial information included data on citrus, apples, pears, grapes, cantaloupes, cucumbers, tomatoes, peppers (bell and non-bell) and tree nuts.

Methods of analysis

The analytical methods for fenpyroximate and its Z-isomer were evaluated both in 1995 and in 1999. GC, HPLC and HLPC-MS were suitable for the residues determination in plant materials. HLPC-MS/MS is suitable for animal products.

The Meeting received information on multi-residue analytical methods based on DFG S19 for the determination of fenpyroximate and it's Z-isomer in a range of commodities, processed fractions and some livestock feeds. The limits of quantification being 0.005 mg/kg (apples, citrus, cotton, hops, grapes, peppers, tomatoes, okra, melons and cucumbers); 0.01 mg/kg (apples, grapes, oranges, cotton seed, strawberries, peaches, pears, plums, beans, cucumbers, peppers and tomatoes); 0.02 mg/kg (oranges, orange juice, dry orange pulp and orange oil); 0.05 mg/kg (melons, tomatoes, tomato paste, tomato puree, peppers, pears, almonds and almond hulls) for fenpyroximate and its Z-isomer. Recoveries were within acceptable limits of 70 to 120%, with the exception of some reported recoveries for fenpyroximate in dry orange pulp and orange oil.

Stability of residues in stored analytical samples

The meeting received information on the frozen storage stability of residues of fenpyroximate and its Z-isomer in citrus, cantaloupes, pears, grapes, tomatoes and peppers in the corresponding supervised residues trials. The storage stability data covered the period of storage of field samples for residue analysis.

Incurred residues of fenpyroximate and its Z-isomer were stable under frozen storage conditions in orange RAC for up to 132 days, in orange juice for up to 210 days, in orange dry pulp for up to 196 days and up to 191 days in orange oil. In melons (cantaloupe), fenpyroximate was shown to be stable for up to 12 months and in apples and pears up to 100 days.

Fenpyroximate and its Z-isomer residues were shown to be stable under frozen storage conditions in grapes up to 268 days, in raisins up to 195 days, in raisin waste up to 195 days, in wet and dry pomace up to 177 days, and in grape juice for up to 165 days.

Fenpyroximate residues fortified in peppers were stable under frozen storage (< –20 °C) up to 403 days.

Incurred fenpyroximate and Z-isomer residues were stable under frozen storage (-29 to -10 °C) in tomato whole fruit for up to 626 days, in tomato paste for up to 547 days and in tomato puree for up to 546 days.

Results of supervised field trials on crops

The Meeting received supervised residue trial data following foliar application of fenpyroximate on citrus fruits, cucumbers, melons (cantaloupes), tomatoes, peppers, apples, pears, grapes, and tree nuts.

Residues of fenpyroximate and its Z-isomer were reported in most studies. However as the Z-isomer is not included in the residue definition, it is not included in the estimation of maximum residue levels and not discussed further in this appraisal. Supervised field trials conducted with different formulations at identical varieties, locations and dates were not considered as independent. The highest result according to the corresponding GAP was selected in these cases. Where multiple samples were taken from a single plot, individual results are reported, amongst which the highest result is used for estimation of maximum residue level. Where results from separate plots with distinct characteristics such as different varieties or treatment schedules were reported, results are listed for each plot.

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 a best estimate of the maximum residue level using expert judgment. Then, the NAFTA calculator was employed. If the statistical calculation spreadsheet suggested a different value from that recommended by the JMPR, a brief explanation of the deviation was 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 fruits

Data were available from supervised trials on oranges, lemons and grapefruits conducted in the USA.

The GAP of fenpyroximate on citrus in the USA is a maximum of two foliar applications at a rate of 0.22 kg ai/ha (not exceeding 0.45 kg ai/ha per growing season), with a PHI of 14 days.

Residues in oranges (whole fruit) from trials in the USA matching critical GAP in rank order were: 0.07, 0.11, 0.18and 0.28 mg/kg.

Residues in lemons (whole fruit) from trials matching critical GAP in the USA in rank order were: 0.17, 0.21 and 0.23 mg/kg.

Residues in grapefruit (whole fruit) from trials matching critical GAP in the USA in rank order were: 0.02, 0.04 and 0.09 mg/kg.

On the basis of the foliar application in the USA, the combined data (whole fruit) in rank order were (n = 10): 0.02, 0.04, 0.07, 0.09, 0.11, 0.17, 0.18, 0.21, 0.23 and 0.28 mg/kg. The Meeting estimated a maximum residue level for the citrus fruit group of 0.5 mg/kg. The previous recommendation of 0.2 mg/kg for fenpyroximate in oranges, sweet and sour, was withdrawn.

The Meeting noted that in trials reported in the evaluation of 1999 JMPR, a reduction factor for residues in whole fruit to pulp of 0.24 can be derived. Taking into account this factor, the Meeting estimated an STMR and HR value of 0.034 and 0.067 mg/kg, respectively.

The maximum residue level estimate derived from use of the NAFTA statistical calculator was 0.45 mg/kg, which, when rounded up, was in agreement with the Meeting's estimation.

Pome fruits

Data were available from supervised trials on apples in the EU and pears in the USA and EU.

For apples, the GAP from France, a single application at 8 g ai/100L PHI 21 days, was considered against the field trials from France and Italy from 2001 and 2006. Only one new trial from Germany matched the GAP, with residues of 0.03 mg/kg.

For pears, the critical GAP in the USA is up to two applications at a maximum application rate of 0.11 kg ai/ha (not exceeding 0.11 kg ai/ha per growing season) with a PHI of 14 days. The new data point for pear trials that matched GAP were in rank order: 0.029, < 0.05, 0.052 and 0.10 mg/kg.

From the EU trials, conducted in France, only one trial matched the GAP from Italy, which is a single application at 7 g ai/100L with a PHI of 14 days. This gave a residue value of 0.04 mg/kg.

In the 1999 evaluation of fenpyroximate, the same GAP from France was used to consider residues in apples from French trials, German trials and one Belgian trial which gave the following data in rank order: 0.03, < 0.05, 0.06, 0.06, 0.08, 0.09, 0.09, 0.09, 0.10, 0.11, 0.12, 0.12, 0.15, 0.16, and 0.16 mg/kg. Including the single value from a 2006 trial gives the following data for apples (n = 16): 0.03, 0.03, < 0.05, 0.06, 0.06, 0.08, 0.09, 0.09, 0.09, 0.10, 0.11, 0.12, 0.12, 0.15, 0.16, and 0.16 mg/kg.

The Meeting considered that the EU data from the 1999 evaluation and the residue of 0.04 mg/kg in pears could be combined to recommend a pome fruit MRL of 0.3 mg/kg, with STMR of 0.09 mg/kg and HR of 0.16 mg/kg for apples, also to be used for pears. Use of the NAFTA calculator gives a maximum residue level of 0.31 mg/kg.

The Meeting recommended a maximum residue level of 0.3 mg/kg for pome fruit to replace the current Codex MRL of 0.3 mg/kg for apples.

Grapes

Data were available from supervised field trials on grapes conducted in Southern regions of the EU to support a review of alternative GAP.

The alternative GAP is from Italy which is a single application at a spray concentration of 0.0051 kg ai/hL with a PHI of 28 days.

Eight trials conducted in Italy, France and Spain matched with the GAP from Italy. Residues found in ranked order were (n = 8): < 0.01, < 0.01, 0.01, 0.02, 0.02, 0.03, 0.05 and 0.05 mg/kg. Including data from the 1995 and 1999 evaluations of fenpyroximate with the current data set, with trials from Italy and France matching the same GAP gives residues in rank order (n = 11): < 0.01, < 0.01, 0.01, < 0.02, 0.02, 0.02, 0.03, 0.04, 0.04, 0.05, and 0.05 mg/kg.

The Meeting considered a value of 0.1 mg/kg to be appropriate as a maximum residue level. Use of the NAFTA calculator resulted in a value of 0.1 mg/kg. The Meeting estimated a maximum residue level of 0.1 mg/kg, an STMR of 0.02 mg/kg and HR of 0.05 mg/kg for fenpyroximate in grapes.

The Meeting agreed to withdraw its previous recommendation of a maximum residue level of 1 mg/kg in grapes.

Fruiting vegetables, Cucurbits

Data were available from supervised trials on cucumbers grown under protected cover in the EU and melons (cantaloupes), grown in the field in the USA.

Cucumber

The GAP of fenpyroximate on greenhouse cucumbers in the USA is a single foliar application at maximum rate of 0.11 kg ai/ha with a PHI of 7 days (not exceeding 0.11 kg ai/ha per growing season).

Residues on greenhouse cucumbers in Europe matching representative GAP in the USA were in ranked order: (n = 9): < 0.01, < 0.01, < 0.01, < 0.01, ≤ 0.01, 0.01, 0.02, 0.02 and 0.02 mg/kg.

The Meeting recommended 0.03 mg/kg as a maximum residue level for cucumbers. Using the NAFTA calculator gave an estimate of 0.03 mg/kg. The corresponding STMR is 0.01 mg/kg and HR value is 0.02 mg/kg.

Melons

The GAP of fenpyroximate on melons in the USA is up to two foliar applications at a maximum rate of 0.11 kg ai/ha with a PHI of 3 days (not exceeding 0.22 kg ai/ha per growing season).

Data from eight residue trials on melons in the USA matched this GAP giving residues in rank order: (n = 8): < 0.05, < 0.05, < 0.05, ≤ 0.05, ≤ 0.05, < 0.05, < 0.05 and < 0.05 mg/kg.

The Meeting agreed to recommend a maximum residue level of 0.05(*) mg/kg for melons. The corresponding STMR and HR values are 0.05 (*) mg/kg.

The NAFTA calculator was not used to derive an estimate as all residue values were below the LOQ, making its application unsuitable.

Fruiting vegetables, other than Cucurbits

Data were available from supervised trials (field and greenhouse) on tomatoes conducted in the USA, Spain, Greece, the UK and France and on peppers in the USA.

Tomatoes

The critical GAP in the USA is up to two sprays at an application rate of 0.11 kg ai/ha (not exceeding 0.22 kg ai/ha per growing season) with a PHI of 1 day for both field and greenhouse tomatoes.

Nineteen trials (16 fields including two cherry tomatoes and three greenhouses) were conducted in the USA which matched USA GAP. Residues from fields in rank order were: < 0.05(7), 0.05, 0.05, 0.06, 0.07, 0.07, 0.08, 0.09, 0.11 and 0.12 mg/kg. Residues from greenhouses were: 0.08, 0.08 and 0.14 mg/kg. This combined data set was used for maximum residue level estimation.

Nine trials (four fields and five greenhouses) were conducted in EU (Greece—one, Spain—five, the UK and France—one) matched Spain GAP. Residues from fields were: 0.02, 0.02, 0.04 and 0.04 mg/kg. Residues from greenhouses were: 0.03, 0.04, 0.04, 0.04 and 0.09 mg/kg.

The Meeting recommended 0.2 mg/kg as a maximum residue level using USA data. Using the NAFTA calculator gives an estimate of 0.15 mg/kg using the USA data. The corresponding STMR is 0.06 mg/kg and HR value is 0.14 mg/kg.

Peppers

The critical GAP in the USA is up to two applications at a rate of 0.11 kg ai/ha (not exceeding 0.22 kg ai/ha per growing season) with a PHI of 1 day.

Matching the USA GAP, residues for 13 field trials in rank order were (n = 13): < 0.05(7), 0.057, 0.058, 0.074, 0.075, 0.12 and 0.13 mg/kg, and residues for three greenhouses in rank order were < 0.05, 0.056 and 0.069 mg/kg. This data set was used for maximum residue level estimation.

The Meeting considered a value of 0.2 mg/kg as a maximum residue level. Use of the NAFTA calculator yielded a value of 0.14 mg/kg. The corresponding STMR is 0.053 mg/kg and HR value is 0.13 mg/kg.

On the basis of the STMR and HR for peppers and the default dehydration factor of 7, an STMR and HR for chilli peppers (dry) were calculated to be 0.37 and 0.9 mg/kg respectively. Based on the HR, the Meeting recommended a maximum residue level for chilli peppers (dry) at 1 mg/kg.

On the basis of estimations on tomatoes and peppers, The Meeting agreed to recommend the group MRL 0.2 mg/kg for fruiting vegetables other than cucurbits, except sweet corn and mushroom.

Tree nuts

Data were available from the supervised field trials conducted in the US.

The critical GAP in the USA is two spray applications at a rate of 0.22 kg ai/ha with a PHI of 14 days.

None of the trials matched the GAP as they were conducted at twice the maximum rate. However, all residues (five on almonds, three on walnuts and five on pecans) in nut meat were less than 0.05 mg/kg.

Based on the US residue data for almonds, walnuts and pecans, the Meeting estimated a maximum residue level of 0.05(*) mg/kg, and a STMR value and HR value of 0.05(*) mg/kg for fenpyroximate in tree nuts.

The NAFTA calculator was not used to derive an estimate as all residue values were below the LOQ, making its application unsuitable.

Animal feed commodities

Almond hulls

As the residue data for tree nuts did not match the USA GAP, the data for hulls were not considered appropriate for estimation of a maximum residue level. The Meeting did not make a recommendation for almond hulls.

Fate of residues in processing

The Meeting received information on the fate of incurred residues of fenpyroximate during the processing of citrus, grapes and tomatoes. The processing factors and STMR-P are summarised in Table 1.

Orange dry pulp, apple wet pomace, grape wet/dry pomace and raisins are expected to contain higher residues than respective raw agricultural commodities. The Meeting estimated processing factors of 0.13 for orange juice and 5.3 for orange dry pulp, giving STMR-P values of 0.018 and 0.74 mg/kg for orange juice and dry pulp, respectively. Using the highest residue value of 0.28 mg/kg for oranges and the PF of 5.3 gives a highest value (P) of 1.5 mg/kg.

Multiplying the HR of grapes found in the supervised trials 0.05 mg/kg by the processing factor of 2.7 resulted in an HR-P and proposed MRL estimate of 0.14 and 0.3 mg/kg for dried grapes. The Meeting estimated processing factors of 0.11, 2.8, 9.6 and 2.7 for grape juice, wet pomace, dry pomace and raisins, respectively. Using the HR of 0.05 mg/kg and the PF of 9.6 for dry pomace gives an HR-P of 0.48.

The Meeting estimated processing factors of 0.54 and 0.44 for tomato paste and puree, respectively.

Table 23 Summary of calculated processing factors

Commodity	Processed fraction	Calculated processing factor	Processing factor	STMR/ STMR-P, mg/kg
Orange [a]	RAC			0.14
	Juice	< 0.13, < 0.02, < 0.02	0.13	0.018
	Dry pulp	6.9, 4.75, 5.3	5.3	0.74
Grape	RAC			0.02
	Juice	< 0.11	0.11	0.0022
	Wet pomace	2.8	2.8	0.056
	Dry pomace	9.6	9.6	0.19
	Raisin	2.7	2.7	0.054
Tomato/US	RAC			0.06
	Paste	0.69, 0.38	0.54	0.032
	Puree	0.44, 0.44	0.44	0.026

[a] Based on whole fruit data

Residues of animal commodities

Farm animal studies on dairy cattle were considered by the 1999 JMPR.

The dietary burden of fenpyroximate residues in farm animals was estimated from the diets listed in OECD Feedstuff derived from field crops. Among commodities reviewed by the 1999 JMPR and 2010 JMPR, apple wet pomace (STMR-P, 0.05 mg/kg), citrus pulp, dry (STMR-P, 0.64 mg/kg), grape pomace, wet (STMR-P, 0.06 mg/kg) and tomato pomace, wet (STMR-P, 0.03 mg/kg) can be fed to beef and dairy cattle. Poultry were not exposed to fenpyroximate through treated feed items.

The maximum dietary burden of beef cattle and dairy cattle was estimated using apple pomace, wet and citrus pulp, dry, and provided in Annex table 1 and 2 of the present meeting report. The summary of livestock dietary burdens of fenpyroximate is shown in Table 2.

As reported in 1999 JMPR, the animal feeding study was conducted at a level equivalent to 1, 3 or 10 ppm in the feed. The maximum and mean dietary burdens in beef cattle and dairy cattle are 0.24 and 0.24 ppm of dry matter diet, which is below the lowest feeding level in the animal feeding study. So the maximum residue levels and STMR values for relevant animal commodities are estimated by applying the transfer factor at the lowest feeding level to the dietary burden. The results are summarised in Table 3.

Table 24 Summary of livestock dietary burdens (ppm of dry matter diet)

	US/CAN		EU		Australia		Japan	
	max	mean	max	mean	max	mean	max	mean
Beef cattle	0.08	0.08	0.06	0.06	0.24[a]	0.24[a]	-	-
Dairy cattle	0.08	0.08	0.16	0.16	0.24[b]	0.24[b]	-	-

[a] suitable for estimating maximum residue levels and STMRs for meat and edible offal.

[b] suitable for estimating a maximum residue level and STMRs for milk.

Table 25 Summary of residues corresponding to the estimated dietary burden

Dietary burden (ppm) Feeding level[ppm]	Milk	Muscle	Liver	Kidney	Fat
MRL					
	mean	highest	highest	highest	highest
MRL beef or dairy cattle					
(0.24)	0.005*F	0.01*	0.01*	0.01*	0.004
[0, 1] for other than milk [0, 3] for milk	[0, 0.011]	[0, < 0.01]	[0, < 0.003]	[0, < 0.003]	[0, 0.018]
STMR					
	mean	mean	mean	mean	mean
STMR beef or dairy cattle					

Dietary burden (ppm) Feeding level[ppm]	Milk	Muscle	Liver	Kidney	Fat
(0.24)	0.001	0	0	0	0.006
[0, 1] for other than milk [0, 3] for milk	[0, 0.011]	[0, < 0.01]	[0, < 0.003]	[0, < 0.003]	[0, 0.015]

The Meeting confirmed the current CXL 0.01 (*) mg/kg for cattle kidney, 0.01(*) mg/kg for cattle liver, 0.02 mg/kg for cattle liver and 0.005(*) mg/kg for cattle milk.

RECOMMENDATIONS

On the basis of the data from supervised trials, the Meeting concluded that the residue levels listed below are suitable for establishing maximum residue limits and for dietary intake assessment.

Definition of the residue for compliance with the MRL and for estimation of dietary intake and for plant and animal commodities: *fenpyroximate.*

Commodity		Recommended MRL mg/kg		STMR or STMR-P	HR or HR-P
CCN	Name	New	Previous		
FP0226	Apple	W [b]	0.3		
FC0001	Citrus fruit	0.5		0.034	0.067
VC0424	Cucumber	0.03		0.01	0.02
DF0269	Dried grapes (= Currants, Raisins and Sultanas)	0.3		0.06	0.14
FB0269	Grapes	0.1	1	0.02	0.05
VO0440	Fruiting Vegetable, other than cucurbits (except sweet corn and mushroom)	0.2		0.06	0.14
VC4199	Melon (except watermelon)	0.05*		0.05*	0.05*
FC0004	Oranges, Sweet, Sour (including Orange-like hybrids)	W [a]	0.02		
HS0444	Peppers, Chili, dried	1		0.37	0.9
FP0009	Pome fruit	0.3		0.09	0.16
TN0085	Tree nuts	0.05*		0.05*	0.05*

*: at or about the limit of quantification

[a] The recommendation for orange is withdrawn, to be replaced by a recommendation for Citrus fruits.

[b] The recommendation for apple is withdrawn, to be replaced by a recommendation for Pome fruit.

DIETARY RISK ASSESSMENT

Long-term intake

The acceptable daily intake (ADI) of 0–0.01 mg/kg bw/day based on the NOAEL for reduced body weight gain in a 2-year study in rats was allocated by 1995 JMPR.

International Estimated Daily Intake (IEDI) was calculated for commodities of human consumption for which STMRs for fenpyroximate were estimated. Results are presented in Annex 3 of the 2010 JMPR Report. The IEDI for the 13 GEMS/Food cluster diets were 6% or less of the maximum ADI. The intake of residues of fenpyroximate resulting from its proposed uses is unlikely to present a public health concern.

Short-term intake

The acute reference dose (ARfD) of 0.02 mg/kg bw was established by the 2007 JMPR.

International Estimates of Short-term Intake (IESTI) have been calculated for the general population (Annex 4) and for children aged 1 to 6 years (Annex 4 of the 2010 JMPR Report). The

results compared to the proposed ARfD of 0.02 mg/kg bw/day show short-term intakes of 20% and 60% for the general population and for children, respectively. The results indicate that short-term intake of fenpyroximate resulting from proposed uses is unlikely to present a public health concern.

REFERENCES

Author	Year	Title	Ref. No
Anonymous	1992	Report on Plant Protection Residue Trial, A-48130, Rep. No,: ER90ESP005000102, Hoechst AG, Germany.	R-4038
Anonymous	1992	Report on Plant Protection Residue Trial, A-48131, Rep. No,: ER90ESP006000102, Hoechst AG, Germany.	R-4039
Anonymous	1992	Report on Plant Protection Residue Trial, A-48130, Rep. No,: ER90ESP005000102, Hoechst AG, Germany.	R-4038
Anonymous	1992	Report on Plant Protection Residue Trial, A-48131, Rep. No,: ER90ESP006000102, Hoechst AG, Germany.	R-4039
Bacher, R.	2005	Fenpyroximate: Validation of an Analytical Residue Method for the Determination of Fenpyroximate in Plant Materials, PTRL Europe, Germany	A-4062
Bacher, R.	2005	Fenpyroximate: Validation of an Analytical Residue Method for the Determination of Fenpyroximate in Plant Materials, PTRL Europe, Germany	A-4062
Barney, W.P.		Fenpyroximate (FujiMite™ 5%EC) Residue Study in Citrus, Grayson Research, LLC., North Carolina, USA.	R-4156
Barney, W.P.	2003	Fenpyroximate (FujiMite™ 5%EC) Residue Study in Citrus, Grayson Research, LLC, North Carolina, USA.	R-4156
Barney, W.P.	2007	Volume 3 Fenpyroximate: Magnitude of the Residue on Cantaloupe, IR-4 Project Headquarters Rutgers, NJ, USA.	R-4195
Barney, W.P.	2008	Volume 4 Fenpyroximate: Magnitude of the Residue on Tomato (Field and Greenhouse), IR-4 Project Headquarters Rutgers, NJ, USA.	R-4196
Barney, W.P.	2007	Volume 2 Fenpyroximate: Magnitude of the Residue on Pepper (Bell & Non Bell, Field and Greenhouse), IR-4 Project Headquarters Rutgers, NJ, USA.	R-4194
Barney, W.P.		Fenpyroximate (FujiMite™ 5%EC) Residue Study in Citrus, Grayson Research, LLC., North Carolina, USA.	R-4156
Barney, W.P.	2008	Volume 4 Fenpyroximate: Magnitude of the Residue on Tomato (Field and Greenhouse), IR-4 Project Headquarters, NJ, USA.	R-4196
Barney, W.P.	2008	Petition Proposing Tolerances for Fenpyroximate Use in the Production of Tomato, Pepper, Eggplant, Okra, Cantaloupe and Greenhouse Cucumbers., New Jersey Agricultural Experiment Station Publication No. A-27200-03-08, IR-4, NJ, USA.	-
Barney, W.P.	2003	Fenpyroximate (FujiMite™ 5%EC) Residue Study in Citrus, Grayson Research, LLC, North Carolina, USA.	R-4156
Barney, W.P.	2007	Volume 3 Fenpyroximate: Magnitude of the Residue on Cantaloupe, IR-4 Project Headquarters Rutgers, NJ, USA.	R-4195
Barney, W.P.	2008	Volume 4 Fenpyroximate: Magnitude of the Residue on Tomato (Field and Greenhouse), IR-4 Project Headquarters Rutgers, NJ, USA.	R-4196
Barney, W.P.	2007	Volume 2 Fenpyroximate: Magnitude of the Residue on Pepper (Bell & Non Bell, Field and Greenhouse), IR-4 Project Headquarters Rutgers, NJ, USA.	R-4194
Barney, W.P.	2008	Volume 4 Fenpyroximate: Magnitude of the Residue on Tomato (Field and Greenhouse), IR-4 Project Headquarters, NJ, USA.	R-4196
Barney, W.P.	2008	Petition Proposing Tolerances for Fenpyroximate Use in the Production of Tomato, Pepper, Eggplant, Okra, Cantaloupe and Greenhouse Cucumbers., New Jersey Agricultural Experiment Station Publication No. A-27200-03-08, IR-4, NJ, USA.	-
Brown, D.	2006	Final Report on Project AD/8929/NN; To conduct validation of an LC-MS/MS analytical method for determination of residues of fenpyroximate and its M-1 metabolite in apples, strawberries, peaches, pears, plums, beans, cucumbers, peppers and tomatoes (2005-2006), Agrisearch, UK.	A-4064
Brown, D.	2006	Final Report on Project AD/8929/NN; To conduct validation of an LC-MS/MS analytical method for determination of residues of fenpyroximate and its M-1 metabolite in apples, strawberries,	A-4 064

Author	Year	Title	Ref. No
		peaches, pears, plums, beans, cucumbers, peppers and tomatoes (2005-2006), Agrisearch, UK.	
Carringer, S.J.	1997	Magnitude of the Residue of Fenpyroximate in Citrus Raw Agricultural and Processed Commodities, American Agricultural Services, Inc., North Carolina, USA.	R-4107
Carringer, S.J.	1997	Magnitude of the Residue of Fenpyroximate in Citrus Raw Agricultural and Processed Commodities, American Agricultural Services, Inc., NC, USA.	R-4107
Carringer, S.J.	1997	Magnitude of the Residue of Fenpyroximate in Citrus Raw Agricultural and Processed Commodities, American Agricultural Services, Inc., North Carolina, USA.	R-4107
Carringer, S.J.	1997	Magnitude of the Residue of Fenpyroximate in Citrus Raw Agricultural and Processed Commodities, American Agricultural Services, Inc., NC, USA.	R-4107
Ellis, C.	2009	Determination of residues of Fenpyroximate after one application of Fenpyroximate 5SC in grapevines at 4 sites in Southern Europe, 2008, Eurofins Agroscience Services, UK.	R-4205
Ellis, C.	2009	Determination of residues of Fenpyroximate after one application of Fenpyroximate 5SC in grapevines at 4 sites in Southern Europe, 2009, Eurofins Agroscience Services, UK.	R-4219
Ellis, C.	2009	Determination of residues of Fenpyroximate after one application of Fenpyroximate 5SC in grapevines at 4 sites in Southern Europe, 2008, Eurofins Agroscience Services, UK.	R-4205
Ellis, C.	2009	Determination of residues of Fenpyroximate after one application of Fenpyroximate 5SC in grapevines at 4 sites in Southern Europe, 2009, Eurofins Agroscience Services, UK.	R-4219
Gills, N.	2004	Volume 6 IR-4 Minor Use Submission in Support of Tolerances for Fenpyroximate in or on Greenhouse Cucumbers (Study title: Final Report on Project AF/6779/NN To determine the magnitude of fenpyroximate residues at intervals and at harvest in the raw agricultural commodity cucumber (protected) resulting from a single directed application of Fenpyroximate 5 SC, in the UK, Southern France and Spain during 2002), Agrisearch, UK.	R-4203
Gills, N.	2004	Volume 6 IR-4 Minor Use Submission in Support of Tolerances for Fenpyroximate in or on Greenhouse Cucumbers (Study title: Final Report on Project AF/6779/NN To determine the magnitude of fenpyroximate residues at intervals and at harvest in the raw agricultural commodity cucumber (protected) resulting from a single directed application of Fenpyroximate 5 SC, in the UK, Southern France and Spain during 2002), Agrisearch, UK.	R-4203
Hill, J. T.	2009	Revision 1 to Quantitation of fenpyroximate residues in raw agricultural and processed commodities: Analytical Protocol, SRS International Corporation, Washington, DE, USA	-
Hill, J. T.	2009	Revision 1 to Quantitation of fenpyroximate residues in raw agricultural and processed commodities: Analytical Protocol, SRS International Corporation, Washington, DE, USA	-
Klimmek, S. and Klimmek, A	2007	Validation of DFG Method S19 (Extended and Revised Version) for the Determination of Residues of Fenpyroximate and its Metabolite M-1 in Matrix with High Water Content (Apple), Eurofins Analytik GmbH, Germany.	A-4068
Klimmek, S. And Klimmek, A.	2007	Validation of DFG Method S19 (Extended and Revised Version) for the Determination of Residues of Fenpyroximate and its Metabolite M-1 in Matrix with High Water Content (Apple), Eurofins Analytik GmbH, Germany.	A-4068
Kramer, G.F.	2003	Memorandum: Fenpyroximate in/on Pome Fruit, Cotton& Grapes, PP#s 0F06437 & 0E06519. Summary of Analytical Chemistry and Residue Data., US/EPA	Ref-1
Kramer, G.F.	2003	Memorandum: Fenpyroximate in/on Pome Fruit, Cotton& Grapes, PP#s 0F06437 & 0E06519. Summary of Analytical Chemistry and Residue Data., US/EPA	Ref-1
Martin, C.	2004	Final Report of Project AF/6782/NN: To determine the magnitude of fenpyroximate residues at intervals and harvest in the raw agricultural commodity tomato (field) and the processed fraction resulting from a single application of Fenpyroximate 5 SC, in Southern France, Northern Spain and Southern Spain, in 2002, Agrisearch, UK.	R-4181
Martin, C.	2004	Final Report on Project AF/6782/NN: To determine the magnitude of	R-4181

Author	Year	Title	Ref. No
		fenpyroximate residues at intervals and harvest in the raw agricultural commodity tomato (field) and the processed fraction resulting from a single application of Fenpyroximate 5SC, in Southern France, Northern Spain and Southern Spain, in 2002, Agrisearch, UK.	
Martin, C.	2004	Final Report of Project AF/6782/NN: To determine the magnitude of fenpyroximate residues at intervals and harvest in the raw agricultural commodity tomato (field) and the processed fraction resulting from a single application of Fenpyroximate 5 SC, in Southern France, Northern Spain and Southern Spain, in 2002, Agrisearch, UK.	R-4181
Martin, C.	2004	Final Report on Project AF/6782/NN: To determine the magnitude of fenpyroximate residues at intervals and harvest in the raw agricultural commodity tomato (field) and the processed fraction resulting from a single application of Fenpyroximate 5SC, in Southern France, Northern Spain and Southern Spain, in 2002, Agrisearch, UK.	R-4181
Oxspring, S.	2005	Volume 5 IR-4 Minor Use Submission in Support of Tolerances for Fenpyroximate in or on Greenhouse Cucumbers (Study title: Final Report on Project AF/6097/NN To determine the magnitude of fenpyroximate residues at intervals and harvest in the raw agricultural commodity protected cucumber resulting from one directed application of Fenpyroximate 5 SC, in the UK, Southern France and Italy, in 2001), Agrisearch, UK.	R-4202
Oxspring, S.	2005	Volume 5 IR-4 Minor Use Submission in Support of Tolerances for Fenpyroximate in or on Greenhouse Cucumbers (Study title: Final Report on Project AF/6097/NN To determine the magnitude of fenpyroximate residues at intervals and harvest in the raw agricultural commodity protected cucumber resulting from one directed application of Fenpyroximate 5 SC, in the UK, Southern France and Italy, in 2001), Agrisearch, UK.	R-4202
Oxspring, S.	2004	Final Report of Project AF/6094/NN: To determine the magnitude of fenpyroximate residues at intervals and harvest in the raw agricultural commodity outdoor tomato resulting from one directed application of Fenpyroximate 5 SC, in Spain and Greece, in 2001, Agrisearch, UK.	R-4178
Oxspring, S.	2005	Final Report of Project AF/6095/NN: To determine the magnitude of fenpyroximate residues at intervals and harvest in the raw agricultural commodity protected tomato resulting from one directed application of Fenpyroximate 5 SC, in the UK, Southern France and Italy, in 2001, Agrisearch, UK.	R-4179
Oxspring, S.	2005	Final Report of Project AF/6781/NN: To determine the magnitude of fenpyroximate residues at intervals and at harvest in the raw agricultural commodity tomato (protected) resulting from a single directed application of Fenpyroximate 5 SC, in the UK and Spain during 2002, Agrisearch, UK.	R-4180
Oxspring, S.	2003	Final Report on Project AF/6100/NN: To determine the magnitude of fenpyroximate residues at intervals and harvest in the raw agricultural commodity apple and pear resulting from a single directed application of Fenpyroximate 5 SC, in Southern France and Italy (2001-2002), Agrisearch, UK.	R-4161
Oxspring, S.	2007	Final Report on Project AF/11088/NN: To determine the magnitude of fenpyroximate and its metabolite M-1 residues at intervals and harvest in the raw agricultural commodity Apple and Pear resulting from a single application of either Kiron 5%SC or Fenpyroximate 5 SC, in Northern France and Germany in 2006, Agrisearch, UK.	R-4185
Oxspring, S.	2003	Final Report on Project AF/6100/NN: To determine the magnitude of fenpyroximate residues at intervals and harvest in the raw agricultural commodity apple and pear resulting from a single directed application of Fenpyroximate 5 SC, in Southern France and Italy (2001-2002), Agrisearch, UK.	R-4161
Oxspring, S.	2007	Final Report on Project AF/11088/NN: To determine the magnitude of fenpyroximate and its metabolite M-1 residues at intervals and harvest in the raw agricultural commodity Apple and Pear resulting from a single application of either Kiron 5%SC or Fenpyroximate 5 SC, in Northern France and Germany in 2006, Agrisearch, UK.	R-4185
Oxspring, S.	2004	Final Report of Project AF/6094/NN: To determine the magnitude of fenpyroximate residues at intervals and harvest in the raw agricultural commodity outdoor tomato resulting from one directed application of Fenpyroximate 5 SC, in Spain and Greece, in 2001, Agrisearch, UK.	R-4178

Author	Year	Title	Ref. No
Oxspring, S.	2005	Final Report of Project AF/6095/NN: To determine the magnitude of fenpyroximate residues at intervals and harvest in the raw agricultural commodity protected tomato resulting from one directed application of Fenpyroximate 5 SC, in the UK, Southern France and Italy, in 2001, Agrisearch, UK.	R-4179
Oxspring, S.	2005	Final Report of Project AF/6781/NN: To determine the magnitude of fenpyroximate residues at intervals and at harvest in the raw agricultural commodity tomato (protected) resulting from a single directed application of Fenpyroximate 5 SC, in the UK and Spain during 2002, Agrisearch, UK.	R-4180
Rose, J.E.	2001	Magnitude of the Residue of Fenpyroximate in/on Processed Fractions Grape Raw Agricultural Commodities, PTRL West, Inc., California, USA.	R-4122
Rose, J.E.	2001	Magnitude of the Residue of Fenpyroximate in/on Processed Fractions Grape Raw Agricultural Commodities, PTRL West, Inc., California, USA.	R-4122
Stewart, E.R.	2006	Fenpyroximate and M-1 Metabolite: Residue Levels on Pear and Cotton from Trials Conducted in the United States During 2005, Stewart Agricultural Research Services, Inc., Missouri, USA.	R-4201
Stewart, E.R.	2006	Fenpyroximate and M-1 Metabolite: Residue Levels on Pear and Cotton from Trials Conducted in the United States During 2005, Stewart Agricultural Research Services, Inc., Missouri, USA.	R-4201
Willard, T.R.	2002	Magnitude of the Residue of Fenpyroximate in/on Pears Following Application of FujiMite 5%EC or FujiMite 5%SC, American Agricultural Services, Inc., NC, USA.	R-4154
Willard, T.R.	2002	Magnitude of the Residue of Fenpyroximate in/on Tree Nuts Following Application of FujiMite 5%EC, American Agricultural Services, Inc., NC, USA.	R-4155
Willard, T.R.	2002	Magnitude of the Residue of Fenpyroximate in/on Pears Following Application of FujiMite 5%EC or FujiMite 5%SC, American Agricultural Services, Inc., NC, USA.	R-4154
Willard, T.R.	2002	Magnitude of the Residue of Fenpyroximate in/on Tree Nuts Following Application of FujiMite 5%EC, American Agricultural Services, Inc., NC, USA.	R-4155