SPIROTETRAMAT (234)

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EXPLANATION

The compound was evaluated by the JMPR for the first time in 2008. The Meeting established an ADI of 0–0.05 mg/kg bw per day and an ARfD of 1 mg/kg/bw and defined the residues as follow:

Residue for enforcement plant commodities: spirotetramat plus spirotetramat enol, expressed as spirotetramat.

Residue for dietary intake plant commodities: *spirotetramat plus the metabolites enol, ketohydroxy, enol glucoside, and monohydroxy, expressed as spirotetramat*.

Residue for enforcement and dietary intake animal commodities: *spirotetramat enol, expressed as spirotetramat*.

The residue is not fat soluble.

The Meeting estimated residue levels for a number of commodities. Additional residue data were evaluated by the 2011 Meeting. Subsequently, the recommendations, including several animal feed commodities, were adopted as Codex MRLs except those for strawberry, avocado and guava.

The manufacturer provided new supervised trial data in avocado, guava and sweet corn and corresponding labels for the evaluation by the 2015 JMPR.

METHODS OF RESIDUE ANALYSIS

Several analytical methods were developed for the residue analysis of spirotetramat in different matrices.

The analytical method 00857 used to measure residues of spirotetramat (STM) and its metabolites, STM-enol, STM-ketohydroxy, STM-mono-hydroxy and STM-enol-Glc was evaluated by the JMPR in 2008. This method was applied with minor modifications for determination of residues in guava, avocado and sweet corn on cob husk removed, sweet corn forage and fodder. The residues were extracted with an acidic acetonitrile/water mixture (4/1,v/v) filtered and quantitated by high performance liquid chromatography/triple stage quadrupole mass spectrometry (LC/MS/MS) using stable isotopically labelled internal standards. The individual analyte derived residues were converted to spirotetramat equivalents and summed up to yield the total residue of BYI08330 calc.1. Additionally the sum of spirotetramat and STM cis-enol was calculated. The limit of quantitation (LOQ) for each analyte was 0.01 mg/kg (expressed as parent equivalents), the LOQ for the total residue was 0.05 mg/kg and was 0.02 mg/kg for the sum of spirotetramat and BYI08330 enol.

The recoveries obtained during the validation of the method and analysis of supervised trial samples are summarized in Tables 1-6.

Table 1 Recoveries for STM, STM-enol, STM-ketohydroxy, STM-mono-hydroxy and STM-enol-Glc in/on guava fruit

Study Trial No. Year	STM, metabolite	n	Spike level (mg/kg)	Recovery (%)				
				Individual recoveries	Min	Max	Mean	RSD
RAFNP042 FN075-07BA-B FN075-07BA-A1 FN075-07BA-A2 FN076-07HA-A1 FN076-07HA-A2 2007/2008	STM	3	0.01	103; 102; 93	93	103	99	5.5
		3	1.0	95; 111; 110	95	111	105	8.5
		6	overall		93	111	102	7.3
	STM cis-enol	3	0.01	102; 104; 98	98	104	101	3.0
		3	1.0	112; 80; 85	80	112	92	18.6
		6	overall		80	112	97	12.5
	STM cis-keto-hydroxy	3	0.01	104; 90; 94	90	104	96	7.5
		3	1.0	105; 115; 113	105	115	111	4.8

Study Trial No. Year	STM, metabolite	n	Spike level (mg/kg)	Recovery (%)				
				Individual recoveries	Min	Max	Mean	RSD
		6	overall		90	115	104	9.6
	STM mono-hydroxy	3	0.01	94; 112; 96	94	112	101	9.8
		3	1.0	103; 110; 110	103	110	108	3.8
		6	overall		94	112	104	7.4
	STM enol-glucoside	3	0.01	78; 74; 75	74	78	76	2.8
		3	1.0	72; 88; 87	72	88	82	10.9
		6	overall		72	88	79	8.7
RAFNL058 FN002-11DB-A FN002-11DB-B FN002-11DB-C FN002-11DB-D FN003-11DA-A FN003-11DA-B FN003-11DA-C FN003-11DA-D 2011	STM	10	0.01	102; 99; 97; 97; 101; 102; 101; 79; 80; 73	73	102	93	12.0
		5	4.0	85; 97; 87; 99; 93	85	99	92	6.6
		15	overall		73	102	93	10.3
	STM cis-enol	10	0.01	103; 93; 92; 102; 103; 117; 96; 97; 111; 73	73	117	99	12.1
		5	4.0	86; 97; 71; 71; 71	71	97	79	15.0
		15	overall		71	117	92	16.2
	STM cis-keto-hydroxy	10	0.010	103; 100; 95; 111; 98; 106; 98; 110; 93; 86	86	111	100	7.8
		5	4.0	108; 108; 93; 118; 106	93	118	107	8.4
		15	overall		86	118	102	8.3
	STM mono-hydroxy	10	0.01	105; 99; 102; 101; 113; 101; 108; 106; 74; 94	74	113	100	10.6
		5	4.0	95; 89; 113; 106; 98	89	113	100	9.4
		15	overall		74	113	100	9.9
	STM enol-glucoside	10	0.01	105; 97; 86; 96; 94; 99; 93; 96; 102; 92	86	105	96	5.6
		5	4.0	90; 86; 85; 84; 91	84	91	87	3.6
		15	overall		84	105	93	6.8

STM: spirotetramat

Table 2 Recoveries for STM, STM-enol, STM-ketohydroxy, STM-mono-hydroxy and STM-enol-Glc in/on avocado fruit

Study Trial No. Year	Spirotetramat, metabolite	n	Spike level (mg/kg)	Recovery (%)				
				Individual recoveries	Min	Max	Mean	RSD
RAFNP042 FN070-07BA-A1 FN070-07BA-A2 FN070-07BA-B FN073-07DA-A1 FN071-07DA-A2 FN072-07HA-A1 FN072-07HA-A2 FN073-07BB-A1 FN073-07BB-A2 FN073-07BB-B FN074-07HA-A1 FN074-07HA-A2 2008	STM	10	0.01	110;101;93;97;91;97;98;111;104;109	91	111	101	7.1
		2	0.10	97;88	88	97	93	
		3	0.50	90;97;96	90	97	94	4.0
		15	overall		88	111	99	7.3
	STM cis-enol	10	0.01	79;78;79;88;76;86; 87;86;86;85	76	88	83	5.4
		2	0.10	90;98	90	98	94	
		3	0.50	77;88;88	77	88	84	7.5
		15	overall		76	98	85	7.0
	STM cis-keto-hydroxy	10	0.01	84;80;86;94;88;82; 109;95;84;100	80	109	90	10.2
		2	0.10	107;91	91	107	99	
		3	0.50	105;101;97	97	105	101	4.0
		15	overall		80	109	94	10.1
	STM mono-hydroxy	10	0.01	103;109;97;96;75;72;69;96;96;78	69	109	89	15.9
		2	0.10	101;96	96	101	99	
		3	0.50	92;101;108	92	108	100	8.0
		15	overall		69	109	93	13.9
	STM enol-glucoside	10	0.01	102;94;90;75;92;79; 73;111;88;107	73	111	91	14.3
		2	0.10	90;89	89	90	90	
		3	0.50	91;87;92	87	92	90	2.9
		15	overall		73	111	91	11.6

STM: spirotetramat

Table 3 Recoveries for STM, STM-enol, STM-ketohydroxy, STM-mono-hydroxy and STM-enol-Glc in/on sweet corn ear without husk

Study Trial No. Year	Spirotetramat, metabolite	n	Spike level (mg/kg)	Recovery (%) Individual recoveries	Min	Max	Mean	RSD
AAFC09-027R AAFC09-027R-116 AAFC09-027R-117 AAFC09-027R-118 AAFC09-027R-119 AAFC09-027R-120 AAFC09-027R-121 AAFC09-027R-122 AAFC09-027R-123 2009	STM	4	0.010	87.4; 81.5; 91.2; 81.9	81.5	91.2	85.5	5.4
		1	0.10	94.6	94.6	94.6	94.6	
		1	1.0	106.5	106.5	106.5	106.5	
		6	overall		81.5	106.5	90.5	10.3
	STM cis-enol	4	0.010	102.0; 99.5; 101.5; 99.8	99.5	102.0	100.7	1.2
		1	0.10	105.0	105.0	105.0	105.0	
		1	1.0	108.5	108.5	108.5	108.5	
		6	overall		99.5	108.5	102.7	3.4
	STM cis-keto-hydroxy	4	0.010	98.8; 97.4; 91.8; 104.5	91.8	104.5	98.1	5.3
		1	0.10	95.4	95.4	95.4	95.4	
		1	1.0	115	115.0	115.0	115.0	
		6	overall		91.8	115.0	100.5	8.2
	STM mono-hydroxy	4	0.010	91.2; 83.0; 94.8; 73.9	73.9	94.8	85.7	10.9
		1	0.10	98.4	98.4	98.4	98.4	
		1	1.0	98.7	98.7	98.7	98.7	
		6	overall		73.9	98.7	90.0	10.9
	STM enol-glucoside	4	0.010	97.6; 95.5; 98.5; 95.0	95.0	98.5	96.7	1.7
		1	0.10	98.4	98.4	98.4	98.4	
		1	1.0	108.0	108.0	108.0	108.0	
		6	overall		95.0	108.0	98.8	4.8
AAFC09-027R AAFC09-027R-116 AAFC09-027R-117 AAFC09-027R-118 AAFC09-027R-119 AAFC09-027R-120 AAFC09-027R-121 AAFC09-027R-122 AAFC09-027R-123 GLP: yes 2009	STM	4	0.010	84.1; 84.9; 80.3; 86.4	80.3	86.4	83.9	3.1
		2	0.10	86.0; 84.4	84.4	86.0	85.2	
		1	1.0	92.8	92.8	92.8	92.8	
		7	overall		80.3	92.8	85.6	4.4
	STM cis-enol	4	0.010	97.1; 97.3; 95.5; 93.5	93.5	97.3	95.9	1.8
		2	0.10	99.5; 99.8	99.5	99.8	99.7	
		1	1.0	93.3	93.3	93.3	93.3	
		7	overall		93.3	99.8	96.6	2.7
	STM cis-keto-hydroxy	4	0.010	95.8; 91.3; 91.1; 97.9	91.1	97.9	94.0	3.6
		2	0.10	93.5; 92.9	92.9	93.5	93.2	
		1	1.0	92.0	92.0	92.0	92.0	
		7	overall		91.1	97.9	93.5	2.7
	STM mono-hydroxy	4	0.010	82.5; 73.3; 73.4; 74.9	73.3	82.5	76.0	5.8
		2	0.10	95.4; 75.5	75.5	95.4	85.5	
		1	1.0	88.7	88.7	88.7	88.7	
		7	overall		73.3	95.4	80.5	10.8
	STM enol-glucoside	4	0.010	92.4; 99.0; 101.5; 95.0	92.4	101.5	97.0	4.2
		2	0.10	94.4; 94.7	94.4	94.7	94.6	
		1	1.0	93.2	93.2	93.2	93.2	
		7	overall		92.4	101.5	95.7	3.4
BCS-0272 B000-T2 GLP: yes 2008	STM	3	0.02	81;85;100	81	100	89	11.3
		3	1	87;95;85	85	95	89	5.9
		6	overall		81	100	89	8.1
	STM cis-enol	3	0.024	94;97;97	94	97	96	1.8
		3	1.2	96;96;95	95	96	96	0.6
		6	overall		94	97	96	1.2
	STM cis-keto-hydroxy	3	0.024	120;116;106	106	120	114	6.3
		3	1.2	86;90;88	86	90	88	2.3
		6	overall		86	120	101	14.9
	STM mono-hydroxy	3	0.024	99;92;98	92	99	96	3.9
		3	1.2	87;91;93	87	93	90	3.4
		6	overall		87	99	93	4.8
	STM enol-glucoside	3	0.016	100;89;109	89	109	99	10.1
		3	0.8	102;94;93	93	102	96	5.1

Study Trial No. Year	Spirotetramat, metabolite	n	Spike level (mg/kg)	Recovery (%) Individual recoveries	Min	Max	Mean	RSD
		6	overall		89	109	98	7.4

Table 4 Recoveries for STM, STM-enol, STM-ketohydroxy, STM-mono-hydroxy and STM-enol-Glc in/on sweet corn fodder.

Study Trial No. Year	Spirotetramat, metabolite	n	Spike level (mg/kg)	Recovery (%) Individual recoveries	Min	Max	Mean	RSD
BCS-0272 B000-T2 GLP: yes 2008	STM	3	0.02	92;92;80	80	92	88	7.9
		3	1.0	86;90;89	86	90	88	2.4
		6	overall		80	92	88	5.2
	STM cis-enol	3	0.024	99;100;90	90	100	96	5.7
		3	1.2	90;83;91	83	91	88	5.0
		6	overall		83	100	92	6.9
	STM cis-keto-hydroxy	3	0.024	86;103;102	86	103	97	9.8
		3	1.2	86;77;83	77	86	82	5.6
		6	overall		77	103	90	11.8
	STM mono-hydroxy	3	0.024	83;97;89	83	97	90	7.8
		3	1.2	87;81;85	81	87	84	3.6
		6	overall		81	97	87	6.5
	STM enol-glucoside	3	0.016	102;106;91	91	106	100	7.8
		3	0.8	93;88;95	88	95	92	3.9
		6	overall		88	106	96	7.2
BCS-0319 C457-T2 C458-T2 C459-T2 2009	STM	3	0.02	90;111;94	90	111	98	11.3
		3	1	94;83;88	83	94	88	6.2
		6	overall		83	111	93	10.3
	STM cis-enol	3	0.024	73;75;84	73	84	77	7.6
		3	1.2	88;87;94	87	94	90	4.2
		6	overall		73	94	84	9.7
	STM cis-keto-hydroxy	3	0.024	114;114;108	108	114	112	3.1
		3	1.2	89;88;93	88	93	90	2.9
		6	overall		88	114	101	12.2
	STM mono-hydroxy	3	0.024	93;84;74	74	93	84	11.4
		3	1.2	84;82;84	82	84	83	1.4
		6	overall		74	93	84	7.3
	STM enol-glucoside	3	0.016	109;102;111	102	111	107	4.4
		3	0.8	84;83;85	83	85	84	1.2
		6	overall		83	111	96	13.7
BCS-0322 AUS-BCS-0322-C471-A AUS-BCS-0322-C472-A AUS-BCS-0322-C473-A 2010	STM	3	0.02	84;85;88	84	88	86	2.4
		3	1.0	98;96;88	88	98	94	5.6
		6	overall		84	98	90	6.5
	STM cis-enol	3	0.024	97;87;81	81	97	88	9.2
		3	1.2	97;95;90	90	97	94	3.8
		6	overall		81	97	91	7.0
	STM cis-keto-hydroxy	2	0.024	109;89	89	109	99	
		3	1.2	94;86;87	86	94	89	4.9
		5	overall		86	109	93	10.2
	STM mono-hydroxy	2	0.024	98;77	77	98	88	
		3	1.2	108;99;95	95	108	101	6.6
		5	overall		77	108	95	11.9
	STM enol-glucoside	3	0.016	99;109;81	81	109	96	14.7
		3	0.8	101;103;95	95	103	100	4.2
		6	overall		81	109	98	9.7

Study Trial No. Year	Spirotetramat, metabolite	n	Spike level (mg/kg)	Recovery (%) Individual recoveries	Min	Max	Mean	RSD
BCS-0322 AUS-BCS-0322-C471-A AUS-BCS-0322-C472-A AUS-BCS-0322-C473-A 2010	STM	3	0.02	102;87;74	74	102	88	16.0
		3	1.0	85;88;85	85	88	86	2.0
		6	overall		74	102	87	10.3
	STM cis-enol	3	0.024	99;83;71	71	99	84	16.7
		3	1.2	84;98;86	84	98	89	8.5
		6	overall		71	99	87	12.0
	STM cis-keto-hydroxy	3	0.024	92;106;78	78	106	92	15.2
		3	1.2	81;87;86	81	87	85	3.8
		6	overall		78	106	88	11.2
	STM mono-hydroxy	3	0.024	85;108;93	85	108	95	12.2
		3	1.2	94;103;96	94	103	98	4.8
		6	overall		85	108	97	8.4
	STM enol-glucoside	3	0.016	96;99;79	79	99	91	11.8
		3	0.8	96;100;92	92	100	96	4.2
		6	overall		79	100	94	8.2

STM: Spirotetramat

Table 5 Recoveries for STM, STM-enol, STM-ketohydroxy, STM-mono-hydroxy and STM-enol-Glc in/on sweet corn forage

Study Trial No. Year	Spirotetramat, metabolite	n	Spike level (mg/kg)	Recovery (%) Individual recoveries	Min	Max	Mean	RSD
AAFC09-027R AAFC09-027R-116 AAFC09-027R-117 AAFC09-027R-118 AAFC09-027R-119 AAFC09-027R-120 AAFC09-027R-121 AAFC09-027R-122 AAFC09-027R-123 2009	STM	4	0.010	93.3;90.6;81.1;85.0	81.1	93.3	87.5	6.3
		1	0.10	92.9	92.9	92.9	92.9	
		1	0.50	101.5	101.5	101.5	101.5	
		6	overall		81.1	101.5	90.7	7.8
	STM cis-enol	4	0.010	94.8; 94.0; 94.0; 96.5	94.0	96.5	94.8	1.2
		1	0.10	95.7	95.7	95.7	95.7	
		1	0.50	99.3	99.3	99.3	99.3	
		6	overall		94.0	99.3	95.7	2.1
	STM cis-keto-hydroxy	4	0.010	93.0; 93.3; 93.2; 102.5	93.0	102.5	95.5	4.9
		1	0.10	92.8	92.8	92.8	92.8	
		1	0.50	98.6	98.6	98.6	98.6	
		6	overall		92.8	102.5	95.6	4.2
	STM mono-hydroxy	4	0.010	95.0; 98.9; 83.3; 86.7	83.3	98.9	91.0	7.9
		1	0.10	97.3	97.3	97.3	97.3	
		1	0.50	98.2	98.2	98.2	98.2	
		6	overall		83.3	98.9	93.2	7.1
	STM enol-glucoside	4	0.010	96.0; 95.5; 95.3; 94.1	94.1	96.0	95.2	0.8
		1	0.10	93.5	93.5	93.5	93.5	
		1	0.50	98.7	98.7	98.7	98.7	
		6	overall		93.5	98.7	95.5	1.9

Table 6 Recoveries for STM, STM-enol, STM-ketohydroxy, STM-mono-hydroxy and STM-enol-Glc in/on sweet corn stover

Study Trial No. Year	Spirotetramat, metabolite	n	Spike level mg/kg	Recovery (%) Individual recoveries	Min	Max	Mean	RSD
AAFC09-027R AAFC09-027R-116 AAFC09-027R-117	Spirotetramat,	4	0.010	84.1; 84.9; 80.3; 86.4	80.3	86.4	83.9	3.1
		2	0.10	86.0; 84.4	84.4	86.0	85.2	
		1	1.0	92.8	92.8	92.8	92.8	
		7	overall		80.3	92.8	85.6	4.4
	STM cis-enol	4	0.010	97.1; 97.3; 95.5; 93.5	93.5	97.3	95.9	1.8

Study Trial No. Year	Spirotetramat, metabolite	n	Spike level mg/kg	Recovery (%)				
				Individual recoveries	Min	Max	Mean	RSD
AAFC09-027R-118 AAFC09-027R-119 AAFC09-027R-120 AAFC09-027R-121 AAFC09-027R-122 AAFC09-027R-123 2009		2	0.10	99.5; 99.8	99.5	99.8	99.7	
		1	1.0	93.3	93.3	93.3	93.3	
		7	overall		93.3	99.8	96.6	2.7
	STM cis-keto-hydroxy	4	0.010	95.8; 91.3; 91.1; 97.9	91.1	97.9	94.0	3.6
		2	0.10	93.5; 92.9	92.9	93.5	93.2	
		1	1.0	92.0	92.0	92.0	92.0	
		7	overall		91.1	97.9	93.5	2.7
	STM mono-hydroxy	4	0.010	82.5; 73.3; 73.4; 74.9	73.3	82.5	76.0	5.8
		2	0.10	95.4; 75.5	75.5	95.4	85.5	
		1	1.0	88.7	88.7	88.7	88.7	
		7	overall		73.3	95.4	80.5	10.8
	STM enol-glucoside	4	0.010	92.4; 99.0; 101.5; 95.0	92.4	101.5	97.0	4.2
		2	0.10	94.4; 94.7	94.4	94.7	94.6	
		1	1.0	93.2	93.2	93.2	93.2	
		7	overall		92.4	101.5	95.7	3.4

Stability of residues in stored analytical samples

Individual data on storage stability of spirotetramat and its metabolites were evaluated by the JMPR in 2008. No new information was provided.

The 2008 Meeting concluded that spirotetramat, when determined as the sum of spirotetramat and its enol, was stable (≥ 80% remaining) for 2 years in tomato, potato, lettuce, almond nutmeat, climbing French beans and tomato paste on various commodities stored frozen for intervals typical of storage prior to analysis. Considered alone, however, spirotetramat may show significant loss (to spirotetramat enol). Likewise, the metabolites spirotetramat enol, spirotetramat ketohydroxy, spirotetramat monohydroxy, spirotetramat enol Glc (glucoside) are stable.

No new information was provided.

USE PATTERN

The use patterns relevant for the residue data submitted for evaluation by the present meeting are summarized in Table 7. Spirotetramat 150 OD is an oil dispersible (OD) formulation containing 150 g ai/L; Spirotetramat 240 SC is a suspension concentrate (SC) formulation containing 240 g ai/L.

Table 7 Foliar spray application for spirotetramat on avocado, guava and sweet corn

Crop and/ country	Pests or Group of pests controlled	Formulation Type	Application					PHI (days)	Remarks:
			No. min max	Interval (min)	kg ai/hL min/ max	Water L/ha min/ max	kg ai/ha min/ max		
Avocado USA	Aphids Avocado thrips Mealybugs Scales Whiteflies	240SC	3	14		3000 max	0.146-0.179	1	Max. dose per season is 0.440 kg/ha
Avocado Mexico		150 OD	3	14	-	n.a.	0.14 0.171	not given	
Avocado Chile		100SC	2	not given	0.085-0.10	2000-3000		3	
Guava USA	Aphids. Avocado thrips Mealybugs Scales Whiteflies	150 OD/ 240 SC	3	14		3000 max	0.146-0.179	1	max. dose per season is 0.440 kg/ha

Crop and/ country	Pests or Group of pests controlled	Formu lation Type	Application					PHI (days)	Remarks:
			No. min max	Interval (min)	kg ai/hL min/ max	Water L/ha min/ max	kg ai/ha min/ max		
Sweet corn Australia	Corn aphid	240S C	1-2	min. 7		Min.200	0.048-0.072	7[a]	
Sweet corn Canada	Aphids	240 SC	3		0.0438		0.053-0.088	7/50[c]	/[b]

[a]: Do not graze or cut for stock food for 7 days after application

[b]: Max. annual rate 0.264 kg/ha

[c]: PHI is 50 days if the crop is being harvested for silage

RESIDUES RESULTING FROM SUPERVISED TRIALS ON CROPS

The residue trials were conducted with the two formulations OD 150 (150 g ai/L) and SC 240 (240 g ai/L). Trials were generally well documented with laboratory and field reports. Laboratory reports included method validation with procedural recoveries from spiking at residue levels similar to those occurring in samples from the 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. Unless stated otherwise, residue data are recorded unadjusted for recovery.

Residues have generally been rounded to two significant figures or, for residues near the LOQ, to one significant figure. Residue values from the trials conducted according to GAP have been used for the estimation of maximum residue levels. Those results used for estimation of maximum residue levels and dietary intake calculations are underlined and double underlined, respectively.

Assorted tropical and sub-tropical fruits – edible peel

Guava

Four supervised field residue trials were conducted with spirotetramat on guava in Mexico in the growing seasons 2007/2008 (2) (Hoag, P.E. and Harbin, A.M. 2009) and 2011 (2) (Hoag, R.E., Fain, J. 2013). Each trial included several plots, where the application parameters varied (spray volume, SC or OD formulation, application rate). In total 13 plots were treated.

Three dilute or concentrated airblast applications of spirotetramat 150 OD were made to guava trees at a target rate of 0.15 kg ai/ha or 0.288 kg ai /ha/application. The actual application rates ranged from 0.147-0.153 and 0.274 to 0.309 g ai/ha/application. Side-by-side bridging trials conducted in 2008 and 2011 received three concentrated airblast applications of spirotetramat 240 SC or spirotetramat OD 150 at the same rate to confirm that the formulation type (OD or SC) does not have any effect on residue behaviour. Adjuvant Dyne Amic or Induce was included in all spray mixtures at a rate of 0.25% or 0.5%, respectively.

Samples of guava fruit were taken 1 and 3 days after last treatment in trials conducted during 2008 growing season. From the 2011 trials samples of guava fruit were taken on day 0, 1, 3, 7 and 12 (14) days after the last treatment. The two parallel samples of guava fruit were analysed using method 00857 with minor modifications. The maximum storage period of deep-frozen samples before analysis was 474 days (5.8 months), which is covered by the storage stability studies. Residues of spirotetramat (STM), STM cis-enol, STM cis-keto-hydroxy, BYI08330 monohydroxy, STM enol-glucoside were determined separately and each expressed as the parent compound. The sum of STM and cis-enol, as well as the sum of residues of STM and 4 metabolites were calculated and expressed as STM.

The full dataset on guava (including the two trials already described in 2010) is presented in Table 8.

Assorted tropical and sub-tropical fruits – inedible peel

Avocado

A total of 5 residue trials are available which were conducted with spirotetramat in avocado in the USA (2) (Hoag, P.E. and Harbin, A.M. 2009.), Chile (2) and Mexico (1) following three broadcast foliar spray applications (either diluted or concentrated spray) of spirotetramat. The nominal application rate per treatment was 0.288 kg ai/ha. Actual application rates for all plots ranged from 0.274 to 0.309 g ai/ha.

Side-by-side bridging plots were included that received three concentrated airblast applications of spirotetramat 240 SC at the rate of 0.288 to 0.272 kg ai/ha/application. The concentrated spray applications were made at spray volumes ranging from 364 to 686 L/ha and the dilute spray applications were made at spray volumes ranging from 1943 to 2839 L/ha. The intervals between applications ranged from 12 to 14 days. For all trials, the first application was made between BBCH 47 and 85. Adjuvant Dyne Amic or Induce was included in all spray mixtures at a rate of 0.25% or 0.5% respectively.

Samples of avocado fruit were taken 1 and 3 days after the last treatment. In one decline trial additional samples were taken on day 0, 5 and 7 days after the last application. The samples were analysed for the parent compound spirotetramat (STM) and its metabolites STM cis-enol, STM cis-keto-hydroxy, STM cis-enol-glucoside and STM 8330 cis-mono-hydroxy using method 00857 with the LOQ of 0.01 mg/kg for each analyte.

The maximum storage period of deep-frozen samples before analysis was 211 days which is covered by the storage stability studies reported by the previous Meeting.

Residue results are presented in Table 9.

Fruiting vegetables – other than cucurbits

Sweet corn

Eight trials on sweet corn were conducted in Canada during the 2009 growing season at about the maximum dose specified on the Canadian label (3 × 0.088 kg ai/ha at 7 days PHI and maximum seasonal rate of 0.264 kg ai/ha) (Lonsbary, S. 2011). Actual application rates ranged from 78 to 95 g as/ha/application, with re-treatment intervals of three to eight days and a PHI of 7 ± 1 days.

Seven trials on sweet corn were conducted in Australia during the growing season 2008 (1), 2009 (3) and 2010 (3) according to Australian label (2 × up to 0.072 kg ai/ha at 7 days interval and 7 day PHI) (Radunz, L. 2009. Radunz, L. 2010.). The actual application rates ranged from 0.015 to 0.08 kg ai/ha/application. The spray intervals between applications ranged from 6 to 9 days. A Hasten adjuvant was included in all spray mixtures at a rate of 0.5–1.0 L/ha.

Ear without husk and fodder samples were collected 6 to 9 days after the final application. Stover samples were collected 33 to 85 days after the last application, according to the normal harvest of stover.

Residues of spirotetramat and its four metabolites STM-enol, STM-ketohydroxy, STM-mono-hydroxy and STM-enol-glucoside (Glc) were analysed using method 00857, including minor modifications. For all analytes the limit of quantitation (LOQ) was determined to be 0.01 mg/kg.

The maximum storage period of deep-frozen samples before analysis was 552 days for Canadian trials and 253 days for Australian trials. These storage periods are covered by the previously reported storage stability studies.

The results are summarized in Tables 10 and 11.

Animal feed

Sweet corn forage, fodder and stover

The trial conditions are described under sweet corn. The results are summarized in Tables 12-14.

Table 8 Results of residue trials conducted with SC 240 and OD 150 formulations on guava in Mexico

Study Trial No.	Plot No. Year	Crop Variety	Appl. Rate [b] (kg ai/ha)	DAT (days)	Residues [mg/kg][a] STM	STM cis-enol	STM cis-keto-hydroxy	STM enol-glucoside	STM mono-hydroxy	Sum of STM and cis-enol	Total residue of STM+4
US GAP: max. 3 x 0.179 at 14 days, PHI of 1 day											
RAFNP042 FN075-07BA Mexico Municipio Juarez	FN075-07BA-B 2008	Guava Media China	240SC 3×[c] 0.274-0.291	1	0.312	0.136	0.042	< 0.01	< 0.01	0.448	0.499
				1	0.188	0.118	0.030	< 0.01	< 0.01	0.306	0.344
				3	0.107	0.082	0.033	< 0.01	< 0.01	0.189	0.226
				3	0.207	0.164	0.036	< 0.01	< 0.01	0.371	0.413
	FN075-07BA-A1 2008	Guava Media China	150OD 3×[c] 0.287-0.297	0	0.187	0.199	0.046	< 0.01	< 0.01	0.386	0.446
				0	0.222	0.148	0.041	< 0.01	< 0.01	0.370	0.426
				1	0.065	0.136	0.029	< 0.01	< 0.01	0.201	0.241
				1	0.091	0.158	0.028	< 0.01	< 0.01	0.249	0.291
				3	0.058	0.115	0.029	< 0.01	0.012	0.173	0.219
				3	0.433	0.107	0.029	< 0.01	< 0.01	0.540	0.580
				5	0.049	0.115	0.042	< 0.01	< 0.01	0.204	0.219
				5	0.041	0.100	0.032	< 0.01	0.013	0.141	0.189
				7	0.024	0.102	0.041	< 0.01	< 0.01	0.126	0.177
				7	0.021	0.083	0.035	< 0.01	0.012	0.104	0.155
	FN075-07BA-A2 2008	Guava Media China	150OD 3×[d] 0.284-0.302	1	0.172	0.215	0.029	< 0.01	< 0.01	0.387	0.423
				1	0.209	0.262	0.042	< 0.01	< 0.01	0.471	0.525
				3	0.056	0.132	0.032	< 0.01	< 0.01	0.188	0.228
				3	0.075	0.122	0.037	< 0.01	< 0.01	0.197	0.241
RAFNP042 FN076-07HA Mexico Calvillo	FN076-07HA-A1 2007	Guava China	150OD 3×[c] 0.283-0.309	1	0.351	0.211	0.020	< 0.01	0.011	0.562	0.600
				1	0.347	0.202	0.018	< 0.01	0.010	0.549	0.585
				3	0.427	0.344	0.023	< 0.01	0.016	0.771	0.815
				3	0.431	0.328	0.030	< 0.01	0.016	0.759	0.810
	FN076-07HA-A2 2007	Guava China	150OD 3×[d] 0.181-0.287	1	0.559	0.338	0.026	< 0.01	0.024	0.897	0.954
				1	0.560	0.355	0.026	< 0.01	0.028	0.915	0.976
				3	0.259	0.169	0.018	< 0.01	< 0.01	0.428	0.457
				3	0.264	0.157	0.016	< 0.01	< 0.01	0.421	0.447
RAFNL058 FN002-11DB Mexico Zitacuaro	FN002-11DB-A 2011	Guava Media China	240SC 3×[c] 0.150-0.152	0	0.246	0.136	0.052	< 0.01	< 0.01	0.382	0.609
				0	0.262	0.152	0.069	< 0.01	< 0.01	0.414	0.616
				1	0.209	0.160	0.038	< 0.01	< 0.01	0.369	0.673
				1	0.185	0.098	0.032	< 0.01	< 0.01	0.283	0.658
				3	0.233	0.141	0.059	< 0.01	< 0.01	0.374	0.533
				3	0.177	0.130	0.047	< 0.01	< 0.01	0.307	0.758
				7	0.126	0.155	0.047	< 0.01	< 0.01	0.281	0.398
				7	0.099	0.152	0.041	< 0.01	< 0.01	0.251	0.575
				14	0.074	0.098	0.065	< 0.01	0.01	0.172	0.211
				14	0.066	0.127	0.066	< 0.01	< 0.01	0.193	0.252
	FN002-11DB-B 2011	Guava Media China	240SC 3×[c] 0.288-0.293	0	0.664	0.178	0.058	< 0.01	< 0.01	0.842	0.910
				0	0.712	0.251	0.099	< 0.01	< 0.01	0.963	1.076
				1	0.362	0.150	0.057	< 0.01	< 0.01	0.512	0.579
				1	0.439	0.231	0.079	< 0.01	< 0.01	0.670	0.761
				3	0.473	0.238	0.076	< 0.01	< 0.01	0.675	0.763
				3	0.404	0.150	0.063	< 0.01	< 0.01	0.554	0.629
				7	0.351	0.279	0.090	< 0.01	< 0.01	0.630	0.734
				7	0.345	0.292	0.092	< 0.01	< 0.01	0.637	0.743
				14	0.219	0.151	0.102	< 0.01	0.014	0.370	0.494
				14	0.163	0.149	0.122	< 0.01	0.011	0.312	0.450

Study Trial No.	Plot No. Year	Crop Variety	Appl. Rate [b] (kg ai/ha)	DAT (days)	Residues [mg/kg][a]						
					STM	STM cis-enol	STM cis-keto-hydroxy	STM enol-glucoside	STM mono-hydroxy	Sum of STM and cis-enol	Total residue of STM+4
Cont. RAFNL058 FN002-11DB	FN002-11DB-C 2011	Guava Media China	150OD 3×[c] 0.147-0.151	0	0.340	0.155	0.080	< 0.01	0.010	0.495	0.591
				0	0.326	0.149	0.061	< 0.01	< 0.01	0.475	0.550
				1	0.229	0.176	0.060	< 0.01	0.010	0.405	0.480
				1	0.185	0.140	0.053	< 0.01	< 0.01	0.325	0.390
				3	0.139	0.156	0.043	< 0.01	0.010	0.295	0.354
				3	0.129	0.136	0.044	< 0.01	< 0.01	0.265	0.323
				7	0.098	0.190	0.071	< 0.01	0.010	0.288	0.374
				7	0.085	0.235	0.078	< 0.01	0.013	0.320	0.419
				14	0.043	0.078	0.082	< 0.01	0.012	0.121	0.223
				14	0.071	0.152	0.090	< 0.01	0.020	0.223	0.341
	FN002-11DB-D 2011	Guava Media China	150OD 3×[c] 0.287-0.291	0	0.529	0.219	0.087	< 0.01	0.014	0.748	0.856
				0	0.466	0.187	0.076	< 0.01	0.013	0.653	0.749
				1	0.449	0.296	0.098	< 0.01	0.015	0.745	0.867
				1	0.375	0.209	0.069	< 0.01	0.013	0.584	0.671
				3	0.305	0.286	0.104	0.011	0.015	0.591	0.720
				3	0.437	0.300	0.097	< 0.01	0.018	0.737	0.862
				7	0.192	0.326	0.137	0.012	0.019	0.518	0.685
				7	0.247	0.310	0.129	0.011	0.016	0.557	0.713
				14	0.166	0.252	0.135	0.012	0.028	0.418	0.593
				14	0.133	0.099	0.138	0.011	0.024	0.232	0.405
RAFNL058 FN003-11DA Mexico Zitacuaro	RAFNL058 FN003-11DA FN003-11DA-A 2011	Guava Calvillo	240SC 3×[c] 0.150-0.153	0	0.369	0.196	0.033	< 0.01	< 0.01	0.565	0.609
				0	0.415	0.161	0.028	< 0.01	< 0.01	0.576	0.616
				1	0.429	0.202	0.032	< 0.01	< 0.01	0.631	0.673
				1	0.424	0.198	0.027	< 0.01	< 0.01	0.622	0.658
				3	0.308	0.181	0.034	< 0.01	< 0.01	0.489	0.533
				3	0.434	0.253	0.059	< 0.01	< 0.01	0.687	0.758
				7	0.205	0.148	0.036	< 0.01	< 0.01	0.353	0.398
				7	0.322	0.194	0.047	< 0.01	< 0.01	0.516	0.575
				12	0.085	0.094	0.024	< 0.01	< 0.01	0.179	0.211
				12	0.085	0.124	0.035	< 0.01	< 0.01	0.209	0.220
Cont. RAFNL058 FN003-11DA	FN003-11DA-B 2011	Guava Calvillo	240SC 3×[c] 0.286-0.291	0	1.14	0.342	0.048	< 0.01	< 0.01	1.482	1.542
				0	0.809	0.299	0.040	< 0.01	< 0.01	1.108	1.159
				1	1.08	0.378	0.062	< 0.01	< 0.01	1.458	1.531
				1	0.785	0.357	0.051	< 0.01	< 0.01	1.142	1.206
				3	0.725	0.339	0.053	< 0.01	< 0.01	1.064	1.128
				3	0.815	0.408	0.053	< 0.01	< 0.01	1.223	1.290
				7	0.627	0.445	0.075	< 0.01	< 0.01	1.072	1.162
				7	0.407	0.335	0.055	< 0.01	< 0.01	0.742	0.808
				12	0.348	0.298	0.058	< 0.01	< 0.01	0.646	0.715
				12	0.409	0.302	0.098	< 0.01	< 0.01	0.711	0.822
	FN003-11DA-C 2011	Guava Calvillo	150OD 3×[c] 0.150-0.153	0	0.324	0.214	0.043	< 0.01	< 0.01	0.538	0.595
				0	0.557	0.387	0.090	0.011	0.015	0.944	1.060
				1	0.411	0.385	0.067	< 0.01	0.010	0.796	0.882
				1	0.396	0.264	0.066	< 0.01	0.012	0.660	0.745
				3	0.321	0.296	0.061	< 0.01	< 0.01	0.617	0.695
				3	0.326	0.316	0.064	< 0.01	< 0.01	0.642	0.722
				7	0.226	0.293	0.093	0.012	0.013	0.519	0.637
				7	0.202	0.323	0.099	0.010	0.014	0.525	0.648
				12	0.110	0.194	0.068	< 0.01	0.011	0.304	0.390
				12	0.087	0.157	0.060	< 0.01	0.011	0.244	0.322

Study Trial No.	Plot No. Year	Crop Variety	Appl. Rate [b] (kg ai/ha)	DAT (days)	Residues [mg/kg][a]						
					STM	STM cis-enol	STM cis-keto-hydroxy	STM enol-glucoside	STM mono-hydroxy	Sum of STM and cis-enol	Total residue of STM+4
	FN003-11DA-D 2011	Guava Calvillo	150OD 3×[c] 0.284-0.293	0	0.914	0.494	0.122	0.015	0.014	1.408	1.560
				0	0.895	0.448	0.107	0.016	0.020	1.343	1.485
				1	0.514	0.310	0.072	0.010	0.012	0.824	0.919
				1	0.636	0.360	0.073	< 0.01	0.012	0.996	1.090
				3	0.433	0.362	0.124	0.011	0.019	0.795	0.951
				3	0.602	0.414	0.093	0.012	0.016	1.016	1.137
				7	0.481	0.455	0.115	0.016	0.020	0.936	1.088
				7	0.465	0.469	0.154	0.015	0.021	0.934	1.122
				12	0.168	0.331	0.121	0.013	0.020	0.499	0.652
				12	0.130	0.219	0.085	0.010	0.013	0.349	0.456

Notes: c: concentrated spray; d: diluted spray;

[1]: The residues were measured in guava fruits.

[b]: The applications were made at growth stages between 77-81.

Calc 1: Residues of STM, STM cis-enol, STM cis-keto-hydroxy, BYI08330 monohydroxy, STM enol-glucoside each expressed as STM. Total residue of STM calc.1 and Sum of STM and STM cis-enol expressed as STM**.**

Table 9 Results of residue trials conducted with spirotetramat on avocado

Study Trial No. Plot No. GLP Year	Crop Variety Year	Appl. rate (kg ai/ha)	DALT (days)	Residues [a]						
				STM (mg/kg)	STM cis-enol (mg/kg)	STM cis-keto-hydroxy (mg/kg)	STM enol-glucoside (mg/kg)	STM mono-hydroxy (mg/kg)	Sum of STM and STM cis-enol (mg/kg)	Total residue of STM calc.1 (mg/kg)
Mexico GAO: 3 times 0.29 kg ai/ha at 14 days intervals and PHI of 1 day										
RAFNP042	Avocado	3×0.288	1	0.082	0.064	0.011	< 0.01	< 0.01	0.146	0.161
FN070-07BA	Haas	(conc.) [c]	1	0.083	0.068	0.010	< 0.01	< 0.01	*0.151*	*0.167*
FN070-07BA-A1	2008		3	0.047	0.052	0.016	< 0.01	< 0.01	0.099	0.121
San Luis Obispo, USA, California			3	0.049	0.054	0.015	< 0.01	< 0.01	0.103	0.128
RAFNP042	Avocado	3×0.288	1	0.101	0.099	0.017	< 0.01	< 0.01	0.200	0.226
FN070-07BA	Haas	(diluted) [c]	1	0.101	0.098	0.016	< 0.01	< 0.01	0.199	0.224
FN070-07BA-A2	2008		3	0.120	0.083	0.021	0.013	< 0.01	*0.203*	*0.240*
San Luis Obispo, USA, California			3	0.120	0.080	0.021	0.011	< 0.01	0.200	0.234
RAFNP042	Avocado	3× 0.288	1	0.120	0.080	0.012	< 0.01	< 0.01	*0.200*	*0.217*
FN070-07BA	Haas	(conc.) [b]	1	0.114	0.075	0.011	< 0.01	< 0.01	0.189	0.204
FN070-07BA-B	2008		3	0.049	0.061	0.014	< 0.01	< 0.01	0.110	0.128
San Luis Obispo, USA California			3	0.048	0.061	0.014	< 0.01	< 0.01	0.109	0.127

Study Trial No. Plot No. GLP Year	Crop Variety Year	Appl. rate (kg ai/ha)	DALT (days)	Residues [a]						
				STM (mg/kg)	STM cis-enol (mg/kg)	STM cis-keto-hydroxy (mg/kg)	STM enol-glucoside (mg/kg)	STM mono-hydroxy (mg/kg)	Sum of STM and STM cis-enol (mg/kg)	Total residue of STM calc.1 (mg/kg)
RAFNP042	Avocado	3×0.288	0	0.031	0.061	0.015	< 0.01	< 0.01	0.092	0.111
FN071-07DA	Hass	(conc.) [c]	0	0.023	0.051	0.011	< 0.01	< 0.01	0.074	0.090
FN073-07DA-A1	2008		1	0.042	0.067	0.012	< 0.01	< 0.01	0.109	0.127
Arroyo Grande, USA California			1	0.031	0.057	< 0.01	< 0.01	< 0.01	0.088	0.101
			3	0.030	0.041	< 0.01	< 0.01	< 0.01	0.071	0.083
			3	0.026	0.032	< 0.01	< 0.01	< 0.01	0.058	0.071
			5	0.031	0.034	< 0.01	< 0.01	< 0.01	0.065	0.076
			5	0.039	0.040	< 0.01	< 0.01	< 0.01	0.079	0.089
			7	0.018	0.045	< 0.01	< 0.01	< 0.01	0.063	0.073
			7	0.050	0.081	0.013	< 0.01	< 0.01	*0.131*	*0.152*
RAFNP042	Avocado	3× 0.288	1	0.036	0.083	0.022	< 0.01	< 0.01	*0.119*	*0.145*
FN071-07DA	Haas	(diluted) [c]	1	0.035	0.062	0.013	< 0.01	< 0.01	0.097	0.114
FN071-07DA-A2	2008		3	0.032	0.057	0.015	< 0.01	< 0.01	0.089	0.110
Arroyo Grande, USA California			3	0.037	0.066	0.012	< 0.01	< 0.01	0.103	0.119
RAFNP042	Avocado	3× 0.288	1	< 0.01	0.011	< 0.01	< 0.01	< 0.01	0.021	0.024
FN072-07HA	Haas	(conc.) [c]	1	0.019	0.050	0.012	< 0.01	< 0.01	*0.069*	*0.087*
FN072-07HA-A1	2008		3	< 0.01	0.018	< 0.01	< 0.01	< 0.01	0.028	0.033
Mexico Nuevo Parangaricutiro			3	< 0.01	0.036	< 0.01	< 0.01	< 0.01	0.046	0.062
RAFNP042	Avocado	3× 0.288	1	< 0.01	0.018	< 0.01	< 0.01	< 0.01	0.028	0.034
FN072-07HA	Haas	(diluted) [c]	1	< 0.01	0.017	< 0.01	< 0.01	< 0.01	0.027	0.034
FN072-07HA-A2	2008		3	< 0.01	0.031	< 0.01	< 0.01	< 0.01	*0.041*	*0.058*
Mexico Nuevo Parangaricutiro			3	< 0.01	0.011	< 0.01	< 0.01	< 0.01	0.021	0.021
RAFNP042	Avocado	3× 0.288	1	0.193	0.080	0.013	< 0.01	< 0.01	0.273	0.291
FN073-07BB	Hass	(conc.) [c]	1	0.224	0.070	0.012	< 0.01	< 0.01	*0.294*	*0.309*
FN073-07BB-A1	2008		3	0.197	0.088	0.012	< 0.01	< 0.01	0.285	0.300
Chile Llay Llay, Valparaiso			3	0.145	0.082	0.011	< 0.01	< 0.01	0.227	0.242
RAFNP042	Avocado	3× 0.288	1	0.144	0.058	0.011	< 0.01	< 0.01	0.202	0.217
FN073-07BB	Hass	(diluted) [c]	1	0.186	0.070	0.016	< 0.01	< 0.01	0.256	0.276
FN073-07BB-A2	2008		3	0.166	0.097	0.017	< 0.01	< 0.01	0.263	0.284
Chile Llay Llay, Valparaiso			3	0.186	0.090	0.019	< 0.01	< 0.01	*0.276*	*0.299*
RAFNP042	Avocado	3× 0.288	1	0.160	0.081	0.011	< 0.01	< 0.01	0.241	0.256
FN073-07BB	Hass	(conc.)[b]	1	0.250	0.098	0.014	< 0.01	< 0.01	*0.348*	0.365
FN073-07BB-B	2008		3	0.224	0.119	0.017	< 0.01	< 0.01	*0.343*	*0.365*
Chile Llay Llay, Valparaiso			3	0.128	0.087	0.012	< 0.01	< 0.01	0.215	0.231
RAFNP042	Avocado	3× 0.288	1	0.059	0.075	0.019	< 0.01	< 0.01	0.134	0.157
FN074-07HA	Hass	(conc.) [c]	1	0.068	0.072	0.016	< 0.01	< 0.01	0.140	0.159
FN074-07HA-A1	2008		3	0.066	0.071	0.020	< 0.01	< 0.01	0.137	0.161
Chile Ocoa, Valparaiso			3	0.079	0.097	0.026	< 0.01	< 0.01	*0.176*	*0.207*

Study Trial No. Plot No. GLP Year	Crop Variety Year	Appl. rate (kg ai/ha)	DALT (days)	Residues [a]						
				STM (mg/kg)	STM cis-enol (mg/kg)	STM cis-keto-hydroxy (mg/kg)	STM enol-glucoside (mg/kg)	STM mono-hydroxy (mg/kg)	Sum of STM and STM cis-enol (mg/kg)	Total residue of STM calc.1 (mg/kg)
RAFNP042 FN074-07HA FN074-07HA-A2 Chile Ocoa, Valparaiso	Avocado Hass 2008	3× 0.288 (diluted) [c]	1 1 3 3	0.087 0.080 0.064 0.068	0.083 0.092 0.073 0.076	0.024 0.025 0.022 0.021	< 0.01 < 0.01 < 0.01 < 0.01	< 0.01 < 0.01 < 0.01 < 0.01	0.170 *0.172* 0.137 0.144	0.200 *0.204* 0.163 0.169

[a]: Residues of STM, STM cis-enol, STM cis-keto-hydroxy, STM enol-glucoside each expressed as STM. Total residue of STM calc.1 and Sum of STM and STM cis-enol expressed as STM. The residues were measured in avocado fruits.

[b] 240 EC;

[c] 150 OD; the applications were made at growth stages between BBCH 47-85.

Table 10 Results of residue trials conducted with an SC 240 formulation in/on sweet corn in Canada

Study Trial No. Plot No. Location Year	Variety Dosage	Dosage Kgai/ha	DALT (days)	Residues [a] [mg/kg]						
				STM	STM cis-enol	STM cis-keto-hydroxy	STM enol-glucoside	STM mono-hydroxy	Sum of STM and STM cis-enol	Total residue of STM calc.1
Canadian max GAP 3 x 0.088 kgai/ha at 7 days with PHI of 7 days.										
AAFC09-027R AAFC09-027R-116 Delhi, 2009	Brocade	3× 0.091-0.093	1 1 3 3 **7** 7 9 9	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	0.38 0.46 0.39 0.37 0.61 0.46 0.39 0.56	0.12 0.12 0.18 0.19 0.11 0.16 0.15 0.075	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	0.390 0.470 0.400 0.380 **0.620** 0.470 0.400 0.570	0.53 0.61 0.59 0.58 **0.75** 0.64 0.57 0.66
AAFC09-027R AAFC09-027R-117 Delhi, 2009	Luscious	3× 0.078-0.091	7 **7**	< 0.01 < 0.01	0.40 0.40	0.12 0.14	< 0.01 < 0.01	< 0.01 < 0.01	0.410 0.410	0.56 0.57
AAFC09-027R AAFC09-027R-118 Harrow, 2009	Fantastic	3 x 0.091-0.095	**7** 7	< 0.01 < 0.01	0.034 0.021	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01 < 0.01	0.044 0.031	0.074 0.061
AAFC09-027R AAFC09-027R-119 Harrow, 2009	Awesome	3× 0.089-0.093	6 **6**	< 0.01 < 0.01	0.024 0.035	0.013 < 0.01	< 0.01 < 0.01	< 0.01 < 0.01	0.034 **0.045**	0.067 **0.075**
AAFC09-027R AAFC09-027R-120 L'Arcadie, 2009	114E Fleet	3×0.087-0.091	**6** 6	< 0.01 < 0.01	0.25 0.20	0.048 0.063	< 0.01 < 0.01	< 0.01 < 0.01	**0.260** 0.210	**0.33** 0.29

Study Trial No. Plot No. Location Year	Variety Dosage	Dosage Kgai/ha	DALT (days)	Residues [a] [mg/kg] STM	STM cis-enol	STM cis-keto-hydroxy	STM enol-glucoside	STM mono-hydroxy	Sum of STM and STM cis-enol	Total residue of STM calc.1
AAFC09-027R AAFC09-027R-121, L'Arcadie 2009	Hybrid Trinity	3×0.087-0.91	7 **7**	< 0.01 < 0.01	0.074 0.096	0.060 0.059	< 0.01 < 0.01	< 0.01 < 0.01	0.084 0.106	0.16 0.19
AAFC09-027R AAFC09-027R-122 Taber, 2009	King Cobb	3 x 0.084-0.086	**7** 7	< 0.01 < 0.01	0.053 0.049	0.048 0.039	< 0.01 < 0.01	< 0.01 < 0.01	**0.063** 0.059	**0.13** 0.12
AAFC09-027R AAFC09-027R-123, Agassiz 2009	G118K Luscious	3×0.087-0.09	7 **7**	< 0.01 < 0.01	0.47 0.47	0.070 0.13	< 0.01 < 0.01	< 0.01 < 0.01	0.480 **0.480**	0.57 **0.63**

[a] Residues of STM, STM cis-enol, STM cis-keto-hydroxy, STM enol-glucoside each expressed as STM. Total residue of STM calc.1 and Sum of STM and STM cis-enol expressed as STM.

Trials 116-117 are not considered independent. Same location, soil 1 week difference in application with same/similar equipment.

Trials 118-119 are not considered independent. Same location, dates of application equipment and soil

Trials 120-121 are not considered independent. Same location, dates of application equipment and soil.

Table 11 Results of residue trials conducted with an SC 240 formulation in/on sweet corn in Australia

Study Trial No. Plot No. Location Year	Variety Dosage	Dosage kg ai/ha	DALT (days)	Residues [a] [mg/kg] STM (mg/kg)	STM cis-enol	STM cis-keto-hydroxy	STM enol-glucoside	STM mono-hydroxy	Sum of STM and STM cis-enol	Total residue of STM calc.1
Australian max GAP: 2×0.072 kg ai/ha at 7 days interval with PHI of 7 days.										
BCS-0272 B000 B000-T2 4343 Gatton 2008	Golden sweet improved	2×0.015-0.016	0* 0 1 3 **7**	< 0.02 < 0.02 < 0.02 < 0.02 < 0.02	0.096 0.096 0.14 0.23 0.22	0.036 0.072 < 0.024 0.036 < 0.024	< 0.016 < 0.016 < 0.016 < 0.016 < 0.016	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024	0.12 0.12 0.16 0.25 **0.24**	0.19 0.23 0.23 0.32 **0.30**
BCS-0319 C457 C457-T2 4805 Bowen 2009	Golden Sweet	2×0.071	0* 0 1 4 **7** 11 14	< 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024 0.036 0.036	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024	< 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024	< 0.044 < 0.044 < 0.044 < 0.044 < 0.044 **0.056** 0.056	< 0.11 < 0.11 < 0.11 < 0.11 < 0.11 **0.12** 0.12
BCS-0319 C458 C458-T2 4805 Bowen 2009	Sentinel	2× 0.071	0* 0 1 4 **7** 11 14	< 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02	< 0.024 < 0.024 < 0.024 < 0.024 0.024 0.036 < 0.02	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024	< 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024	< 0.044 < 0.044 < 0.044 < 0.044 0.044 0.056 < 0.044	< 0.11 < 0.11 < 0.11 < 0.11 0.11 0.12 < 0.11

Study Trial No. Plot No. Location Year	Variety Dosage	Dosage kg ai/ha	DALT (days)	Residues [a] [mg/kg]						
				STM (mg/kg)	STM cis-enol	STM cis-keto-hydroxy	STM enol-glucoside	STM mono-hydroxy	Sum of STM and STM cis-enol	Total residue of STM calc.1
BCS-0319 C459 C459-T2 4341 Laidley 2009	H5	2×0.072-0.075	0* 0 1 3 **7** 10 14	< 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02	< 0.024 < 0.024 0.036 0.048 0.036 0.048 0.084	0.036 0.036 0.036 0.060 0.084 0.048 0.036	< 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024	< 0.044 < 0.044 0.056 0.068 0.056 0.068 <u>0.10</u>	0.12 0.12 0.13 0.17 0.18 0.16 <u>0.18</u>
BCS-0322 C471 AUS-BCS-0322-C471-A 3981 Koo Wee Rup 2010	Golden Sweet	2×0.073	0* 0 1 4 **7** 11 14	< 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02	0.17 0.17 0.16 0.43 0.38 0.35 0.37	0.096 0.28 0.096 0.084 0.18 0.18 0.28	< 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024	0.19 0.19 0.18 0.45 <u>0.40</u> 0.37 0.39	0.32 0.50 0.31 0.58 <u>0.62</u> 0.59 *<u>0.71</u>*
BCS-0322 C472 AUS-BCS-0322-C472-A 4380, Stanthorpe 2010	Spaceship	2×0.068-0.070	0* 0 1 3 **7** 10 13	< 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02	0.06 0.06 0.072 0.096 0.096 0.084 0.084	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024	< 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024	0.08 0.08 0.092 0.12 <u>0.12</u> 0.10 0.10	0.14 0.14 0.16 0.18 <u>**0**.18</u> 0.17 0.17
BCS-0322 C473 AUS-BCS-0322-C473-A 7307 Wesley Vale, 2010	Super Sweet	2×0.078-0.080	0* 0 1 3 **7** 10 14	< 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02	0.036 0.036 0.048 0.072 0.096 0.096 0.084	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024	< 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024	0.056 0.056 0.068 0.092 <u>0.12</u> 0.12 0.10	0.12 0.12 0.13 0.16 <u>0.18</u> 0.18 0.17

[a]: Residues of STM, STM cis-enol, STM cis-keto-hydroxy, STM enol-glucoside each expressed as STM. Total residue of STM calc.1 and Sum of STM and STM cis-enol expressed as STM.

Animal feed

Table 12 Results of residue trials conducted with an SC 240 formulation in/on sweet corn forage in Canada

Study Trial No. Plot No. Location Year	Variety	Dosage	DALT (days)	Residues [mg/kg]						
				STM	STM cis-enol	STM cis-keto-hydroxy	STM enol-glucoside	STM mono-hydroxy	Sum of STM and STM cis-enol	Total residue of STM+4 metabolite
Canadian max GAP 3 × 0.088 kg ai/ha at 7 days with PHI of 7 days.										
AAFC09-027R AAFC09-027R-116 Delhi, 2009	Brocade	3× 0.091-0.093	1 1 3 3 **7** 7 9 9	0.59 0.77 0.047 0.031 0.018 0.015 0.014 0.017	0.45 0.42 0.14 0.18 0.17 0.15 0.12 0.12	0.22 0.21 0.14 0.11 0.15 0.093 0.095 0.12	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	1.040 1.190 0.187 0.211 0.188 0.165 0.134 0.137	1.28 1.42 0.34 0.34 0.36 0.27 0.25 0.28
AAFC09-027R AAFC09-027R-117 Delhi, 2009	Luscious	3× 0.078-0.091	**7** 7	0.035 0.021	0.081 0.092	0.15 0.13	< 0.01 < 0.01	< 0.01 < 0.01	0.116 0.113	0.29 0.26
AAFC09-027R AAFC09-027R-118 Harrow, 2009	Fantastic	3× 0.091-0.095	7 **7**	< 0.01 0.010	0.011 0.013	0.011 0.012	< 0.01 < 0.01	< 0.01 < 0.01	0.021 0.023	0.052 0.055
AAFC09-027R AAFC09-027R-119 Harrow, 2009	Awesome	3× 0.089-0.093	6 **6**	0.010 0.010	0.017 0.017	0.013 0.012	< 0.01 < 0.01	< 0.01 < 0.01	0.027 0.027	0.060 0.060
AAFC09-027R AAFC09-027R-120 L'Arcadie 2009	114E Fleet	3× 0.087-0.091	**6** 6	0.097 0.077	0.088 0.091	0.11 0.095	< 0.01 < 0.01	< 0.01 < 0.01	0.185 0.168	0.32 0.28
AAFC09-027R AAFC09-027R-121 L'Arcadie 2009	Hybrid Trinity	3×0.087-0.91	7 **7**	0.14 0.16	0.096 0.096	0.076 0.091	< 0.01 < 0.01	< 0.01 < 0.01	0.236 0.256	0.33 0.37
AAFC09-027R AAFC09-027R-122 Taber, 2009	King Cobb	3× 0.084-0.086	7 **7**	1.3 1.7	0.29 0.29	0.14 0.11	< 0.01 < 0.01	< 0.01 < 0.01	1.590 1.990	1.7 2.1
AAFC09-027R AAFC09-027R-123 Agassiz, 2009	G118K Luscious	3× 0.087-0.09	**7** 7	0.050 0.022	0.12 0.17	0.12 0.066	< 0.01 < 0.01	< 0.01 < 0.01	0.170 0.192	0.31 0.27

Table 13.Results of residue trials conducted with an SC 240 formulation in/on sweet corn stover in Canada

Study Trial No. Plot No.GLP Year	Variety	Dosage	DALT (days)	Residues [mg/kg]						
				STM	STM cis-enol	STM cis-keto-hydroxy	STM enol-glucoside	STM mono-hydroxy	Sum of STM and STM cis-enol	Total residue of STM calc.1
Canadian max GAP 3 x 0.088 kg ai/ha at 7 days with PHI of 7 days.										
AAFC09-027R AAFC09-027R-116 Canada, Delhi 2009	Brocade	3× 0.091-0.093	50 50 **56** 56 64 64 69 69	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	< 0.01 < 0.01 0.014 0.012 0.011 0.011 0.010 < 0.01	0.027 0.043 0.028 0.043 0.039 0.037 0.065 < 0.01	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	< 0.02 < 0.02 0.024 0.022 0.021 0.021 0.020 < 0.02	0.067 0.083 0.071 0.085 0.079 0.078 0.11 < 0.05

Study Trial No. Plot No.GLP Year	Variety	Dosage	DALT (days)	Residues [mg/kg]						
				STM	STM cis-enol	STM cis-keto-hydroxy	STM enol-glucoside	STM mono-hydroxy	Sum of STM and STM cis-enol	Total residue of STM calc.1
AAFC09-027R AAFC09-027R-117 Canada, Delhi 2009	Luscious	3× 0.078-0.091	**56** 56	< 0.01 < 0.01	0.017 < 0.01	0.036 0.036	< 0.01 < 0.01	< 0.01 < 0.01	0.027 < 0.02	0.083 0.076
AAFC09-027R AAFC09-027R-118 Canada , Harrow 2009	Fantastic	3× 0.091-0.095	85 **85**	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01 < 0.01	< 0.02 < 0.02	< 0.05 < 0.05
AAFC09-027R AAFC09-027R-119 Canada, Harrow 2009	Awesome	3× 0.089-0.093	55 **55**	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01 < 0.01	< 0.02 < 0.02	< 0.05 < 0.05
AAFC09-027R AAFC09-027R-120 Canada L'Arcadie 2009	114E Fleet	3×0.087-0.091	**55** 55	0.010 0.020	0.020 < 0.01	0.062 0.056	< 0.01 < 0.01	< 0.01 < 0.01	0.030 0.030	0.11 0.11
AAFC09-027R AAFC09-027R-121 Canada L'Arcadie 2009	Hybrid Trinity	3×0.087-0.91	47 **47**	0.021 0.026	0.011 0.16	0.037 0.082	< 0.01 < 0.01	< 0.01 < 0.01	0.032 0.186	0.089 0.14
AAFC09-027R AAFC09-027R-122 Canada, Taber 2009	King Cobb	3 x 0.084-0.086	**47** 47	0.40 0.32	0.059 0.050	0.16 0.13	< 0.01 < 0.01	< 0.01 < 0.01	0.459 0.370	0.64 0.52
AAFC09-027R AAFC09-027R-123 Canada Agassiz 2009	G118K Luscious	3×0.087-0.09	85 **85**	0.020 0.040	< 0.01 0.022	0.022 0.051	< 0.01 < 0.01	< 0.01 < 0.01	0.030 0.062	0.072 0.13

Table 14 Results of residue trials conducted with an SC 240 formulation in/on sweet corn fodder in Australia

Study Trial No. Plot No. Year	Variety	Dosage	DALT (days)	Residues[1] [mg/kg] STM (mg/kg)	STM cis-enol	STM cis-keto-hydroxy	STM enol-glucoside	STM mono-hydroxy	Sum of STM and STM cis-enol	Total residue of STM calc.1
Australian max GAP: 2×0.072 kgai/ha at 7 days interval with PHI of 50 days for stover.										
BCS-0272 B000 B000-T2 Australia 4343 Gatton 2008	Golden sweet improved	2×0.015 -0.016	0* 0 1 3 **7**	0.05 1.94 2.00 0.94 0.10	0.04 1.2 0.70 0.36 0.096	0.11 0.20 0.22 0.29 0.16	< 0.016 < 0.016 < 0.016 < 0.016 < 0.016	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024	0.086 3.14 2.70 1.30 0.20	0.23 3.38 2.95 1.63 0.39
BCS-0319 C457 C457-T2 Australia 4805 Bowen 2009	Golden Sweet	2×0.071	0* 0 1 4 **7** 14	0.30 1.55 1.49 1.31 0.21 0.11	0.096 0.74 0.26 0.46 0.096 0.036	0.096 0.17 0.19 0.58 0.23 0.12	< 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024	0.40 2.29 1.75 1.77 0.31 0.15	0.53 2.50 1.99 2.38 0.57 0.31
BCS-0319 C458 C458-T2 Australia 4805 Bowen 2009	Sentinel	2× 0.071	0* 0 1 4 **7** 14	0.34 1.41 1.35 0.83 0.38 0.15	0.096 0.65 0.24 0.26 0.20 0.060	0.11 0.17 0.20 0.31 0.37 0.22	< 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024	0.44 2.06 1.59 1.09 0.58 0.21	0.58 2.27 1.83 1.45 1.00 0.47
BCS-0319 C459 C459-T2 Australia 4341 Laidley 2009	H5	2×0.072 -0.075	0* 0 1 3 **7** 14	0.05 1.80 0.28 0.27 0.16 0.04	0.036 0.91 0.38 0.16 0.12 < 0.024	0.060 0.18 0.17 0.22 0.31 0.096	< 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024	0.086 2.71 0.66 0.43 **0**.28 0.064	0.19 2.93 0.87 0.68 0.63 0.20
BCS-0322 C471 AUS- BCS- 0322- C471-A 3981 Koo Wee Rup 2010	Golden Sweet	2×0.073	0* 0 1 4 **7** 11 14	0.40 1.16 1.11 0.47 0.25 0.11 0.16	0.14 0.72 0.35 0.26 0.084 0.048 0.072	0.19 0.18 0.22 0.23 0.17 0.12 0.22	< 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024	0.54 1.88 1.46 0.73 0.33 0.16 0.23	0.78 2.10 1.71 1.00 0.54 0.32 0.49
BCS-0322 C472 AUS- BCS- 0322- C472-A Australia 4380 Stanthorpe 2010	Spaceship	2×0.068- 0.070	0* 0 1 3 **7** 10 13	0.59 1.91 1.26 0.47 0.34 0.18 0.12	0.17 0.17 0.18 0.16 0.16 0.11 0.072	0.60 0.36 0.37 0.38 0.83 0.68 0.55	< 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016 < 0.016	< 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024 < 0.024	0.76 2.08 1.44 0.63 0.50 0.29 0.19	1.40 2.48 1.85 1.05 1.36 1.01 0.78

Study Trial No. Plot No. Year	Variety	Dosage	DALT (days)	Residues[1] [mg/kg] STM (mg/kg)	STM cis-enol	STM cis-keto-hydroxy	STM enol-glucoside	STM mono-hydroxy	Sum of STM and STM cis-enol	Total residue of STM calc.1
BCS-0322 C473 AUS-BCS-0322-C473-A Australia 7307 Wesley Vale 2010	Super Sweet	2×0.078 -0.080	0*	0.40	0.24	0.55	< 0.016	< 0.024	0.64	1.23
			0	1.46	0.52	0.48	< 0.016	< 0.024	1.98	2.50
			1	0.39	0.31	0.42	< 0.016	< 0.024	0.70	1.16
			3	0.16	0.12	0.23	< 0.016	< 0.024	0.28	0.55
			7	0.08	0.036	0.096	< 0.016	< 0.024	0.12	0.25
			10	0.11	0.072	0.25	< 0.016	< 0.024	0.18	0.47
			14	0.06	0.048	0.17	< 0.016	< 0.024	0.11	0.32

FATE OF RESIDUES IN STORAGE AND PROCESSING

In storage

No data are available from the storage under warehouse conditions.

In processing

The effect of processing on spirotetramat residues have already been evaluated by JMPR in 2008. The meeting concluded that spirotetramat-enol was resistant to hydrolysis under all test conditions. Processing factors have been established for cooked bean (0.46), canned tomato (0.58) and canned cherries (0.47). In all these commodities the reduction of residues was observed. Similarly, it is expected that the residues will not concentrate in sweet corn.

RESIDUES IN ANIMAL COMMODITIES

Farm animal feeding studies

Based on a dairy cattle feeding study and poultry metabolism study the 2008 JMR estimated residue levels in animal commodities. No new information was provided.

APPRAISAL

The compound was evaluated by the JMPR for the first time in 2008. The Meeting established an ADI of 0–0.05 mg/kg bw per day and an ARfD of 1 mg/kg/bw and defined the residues as follow:

Residue for enforcement plant commodities: spirotetramat plus spirotetramat enol, expressed as spirotetramat.

Residue for dietary intake plant commodities: *spirotetramat plus the metabolites enol, ketohydroxy, enol glucoside, and monohydroxy, expressed as spirotetramat*.

Residue for enforcement and dietary intake animal commodities: *spirotetramat enol, expressed as spirotetramat*.

The residue is not fat soluble.

Additional residue data were evaluated by the 2011 JMPR.

Spirotetramat was listed by the Forty-sixth Session of CCPR (2014) for the evaluation by the 2015 JMPR for additional MRLs. Supervised trials data were submitted for evaluation on avocado, guava and sweet corn for the evaluation by the 2015 JMPR.

Analytical methods

Analytical methods were evaluated by the 2008 and 2011 Meetings. Recovery data obtained from the analysis of avocado, guava and sweet corn and sweet corn fodder. The limit of quantification was 0.01 mg/kg for individual residues. The residues of individual analyte were expressed as spirotetramat equivalents and summed up to yield the total residue of spirotetramat plus enol (LOQ 0.02 mg/kg) and spirotetramat plus 4 metabolites (LOQ 0.05 mg/kg). The recoveries for individual residue components in the matrices tested 0.01 and 0.1 mg/kg or 1.0 and 10 mg/kg spike level and their relative standard deviations were within acceptable range.

Stability of analytes

Individual data on storage stability of spirotetramat and its metabolites were evaluated by the JMPR in 2008. The Meeting concluded that spirotetramat including its enol metabolite was stable (≥ 80% remaining) for about 2 years in tomato, potato, lettuce, almond nutmeat, climbing French beans and tomato paste. No new information was provided.

Residues resulting from supervised trials in crops

Results of new trials and some of the previously submitted ones on guava, avocado and sweet corn were evaluated by the present meeting. The sum of respective residues was expressed in spirotetramat equivalent.

Assorted tropical and sub-tropical fruits – edible peel

Guava

In 2008 and 2011, four residue trials in guava were conducted (including 13 plots) in Mexico. The trials were performed either with the OD 150 or the SC 240 formulation. The trials were conducted at two different application rates: 3× 0.288 kg ai/ha or 3× 150 kg ai/ha at spray intervals of 14 days. The US GAP permits 3 applications at 0.179 kg ai/ha rate at 14 days intervals with a PHI of 1 day. The results of supervised trials conducted in Mexico are evaluated against the US GAP.

The results indicate that the type of formulation and concentration of the spray solution did not affect the residue level. Therefore, the highest residues were selected from each set of trials.

The sum of residues of spirotetramat and its enol metabolite deriving from the 3 times 0.288 kg ai/ha nominal application rates at 1-3 days after last application were: 0.429, 0.660, 0.906 and 1.30 mg/kg.

Taking into account the nominal application rate of 288 g ai/ha and the USA GAP rate of 179 g ai/ha, the scaling factor is 179/228=0.6215. The residues scaled to match US GAP are in rank order: 0.27, 0.41, 0.56, and 0.81 mg/kg.

The sum of residues of spirotetramat and 4 metabolites are: 0.474, 0.79, 0.965 and 1.37 mg/kg.

The residues scaled to US GAP are: 0.29, 0.49, 0.60, and 0.85 mg/kg.

The Meeting estimated maximum residue level of 2 mg/kg, an HR of 0.85 mg/kg and an STMR residue of 0.55 mg/kg.

Assorted tropical and sub-tropical fruits – inedible peel

Avocado

The uses on avocado and the corresponding residue trials were previously submitted in 2010, but no recommendation could be made at that time. Subsequently, the GAPs of Chile and Mexico have been changed.

The use of spirotetramat in/on avocado is registered in the USA (3 applications of maximum 0.179 kg ai/ha at 14 days interval with a maximum seasonal rate of 0.44 kg ai/ha and PHI of 1 day), Chile (2 applications with a maximum seasonal rate of 0.8 kg ai/ha and PHI of 3 days) and Mexico (1 applications at maximum rate of 0.168 kg ai/ha and PHI of 1 day.

Five trials were conducted in USA, Chile and Mexico with nominal application rates of 0.288 kg ai/ha.

The critical GAP is from USA. The results of trials were evaluated based on the US GAP.

The highest sum of spirotetramat and enol from each replicate plots corresponding to this GAP are: 0.045, 0.11, 0.17, 0.20, 0.29 mg/kg.

Taking into account the targeted application rates of 0.288 and the maximum authorised rate of 0.179, the scaling factor is 0.179/0.288=0.6215.

The scaled residues in avocado fruits were in rank order: 0.028, 0.067, 0.106, 0.125, and 0.183 mg/kg.

For dietary intake assessment the sum of residues of spirotetramat and 4 metabolites was considered. They are in rank order: 0.055, 0.13, 0.20, 0.24, and 0.31 mg/kg.

The scaled residues in rank order are: 0.034, 0.080, 0.126, 0.147, and 0.193 mg/kg.

The highest residue observed in any single sample was 0.23 mg/kg.

The Meeting estimated a maximum residue level an STMR and HR of 0.4 mg/kg, 0.126 mg/kg and 0.23 mg/kg, respectively.

Sweet corn

Seven trials were conducted in Australia between 2008 and 2010 with applications close to Australian maximum GAP (2 times 0.072 kg ai/ha at 7 day intervals with a PHI of 7 days). One sample was taken from each plot.

In Australian trials the sum of spirotetramat and enol in ear without husk were: 0.056, 0.056, 0.1, 0.12, 0.12, 0.24 and 0.40 mg/kg.

For dietary intake assessment the sum of residues of spirotetramat and 4 metabolites was considered. They were in rank order: 0.12, 0.12, 0.18, 0.18, 0.18, 0.3 and 0.62.

Eight trials were conducted in Canada approximating maximum GAP which permits treatments with 3 × 0.088 kg ai/ha at 7 days intervals and a PHI of 7 days. Duplicate samples were taken in each trial.

Some Canadian trials were carried out at the same location, timing, dosage and equipment. The highest sum of spirotetramat and enol in ear without husk from the independent trials were: 0.040, 0.061, 0.235, 0.48 and 0.545 mg/kg.

For dietary intake assessment the sum of residues of spirotetramat and 4 metabolites was considered. They were in rank order: 0.071, 0.125, 0.31, 0.60 and 0.695 mg/kg.

The maximum residue in a single sample was 0.75 mg/kg.

Based on the Canadian trials reflecting maximum GAP, the Meeting estimated a maximum residue level of 1.5 mg/kg, and for dietary risk assessment an STMR residue of 0.31 mg/kg and an HR of 0.75 mg/kg.

Animal feed

Residue data on sweet corn forage and stover derived from supervised trials conducted in Australia and Canada were made available for evaluation. The trial conditions, reflecting maximum GAP are described under sweet corn.

The independent Canadian trials resulted in the following highest average residues:

Sum of spirotetramat and enol:

Sweet corn forage 7 days after last application: 0.027, 0.18, 0.18, 0.25 and 1.8 mg/kg.

Sum of residues of spirotetramat and 4 metabolites:

Sweet corn forage 7 days after last application: 0.06, 0.29, 0.32, 0.35 and 1.9 mg/kg.

The meeting estimated 0.32 mg/kg median and 1.9 mg/kg high residue for animal burden calculation.

In the independent Canadian trials 47–85 days after last application the residues in sweet corn stover were:

Sum of spirotetramat and enol: < 0.02, 0.023, 0.046, 0.11 and 0.41 mg/kg

Sum of residues of spirotetramat and 4 metabolites: < 0.05, 0.078, 0.10, 0.11, and 0.58 mg/kg.

In Australian trials 7 days after last application the sum of residues in/on sweet corn fodder was:

Spirotetramat and enol: 0.18, 0.2, 0.31, 0.28, 0.33, 0.5, 0.58 mg/kg.

Spirotetramat and 4 metabolites: 0.39, 0.47, 0.54, 0.57, 0.63, 1.0, and 1.36 mg/kg,

The Australian trials resulted in higher residues in sweet corn stover and fodder. Based on the Australian trials the Meeting estimated highest and median residues of 1.36 mg/kg and 0.57 mg/kg for sweet corn stover and fodder.

Farm animal feeding studies

Based on a dairy cattle feeding study and poultry metabolism study the 2008 JMPR estimated residue levels in animal commodities. No new information was provided.

Residues in animal commodities

The residues in sweet corn forage and stover do not increase the maximum animal burden that would affect the maximum, HR and median residue values estimated by the 2008 Meeting.

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.

CCN	Commodity	Recommended Maximum residue level (mg/kg)		STMR or STMR-P mg/kg	HR or HR-P mg/kg
		New	Previous		
FI 0326	Avocado	0.4		0.126	0.23
FI 0336	Guava	2		0.55	0.85
GC 0447	Sweet corn	1.5		0.31	0.75

DIETARY RISK ASSESSMENT

Long-term intake

The ADI is 0–0.05 mg/kgbw. The long-term intake calculated for the commodities considered by the present meeting is 0% of maximum ADI and did not affect the previously made long-term dietary estimates. Hence, a new risk assessment was not necessary.

Short-term intake

The ARfD is 1 mg/kgbw. The estimated short-term intakes of avocado, guava and sweet corn are up to 1% 2% of ARfD for the general population and children.

The Meeting concluded that the short-term intake of residues of spirotetramat from the uses

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