

ACETAMIPRID (246)

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EXPLANATION

Acetamiprid is a neonicotinoid insecticide with contact and stomach action against a range of plant pests such as Hemiptera, Thysanoptera and Lepidoptera acting as an agonist of the nicotinic acetylcholine receptor in the insect central nervous system. It exhibits translaminar activity in plants and is authorized for use in a variety of crops worldwide.

Acetamiprid was evaluated for the first time by the 2011 JMPR, where an ADI of 0–0.07 mg/kg bw and an ARfD of 0.1 mg/kg bw were established, and maximum residue levels were recommended for a range of plant and animal commodities. In 2012, JMPR reconsidered acute dietary risks from maximum residue levels recommended for leafy vegetables (except spinach) and spinach and then withdrew them. Currently, there are no CXLs established for any leafy vegetables.

At the 46th Session of the CCPR (2014), acetamiprid was listed for residue evaluation for additional maximum residue levels by the 2015 JMPR. The Meeting received information on supervised residue trials for cucumber (including fruit cucumber) and tomato (including cherry tomato) from China and for sweet corn (corn-on-the-cob), mustard greens and asparagus from USA. For sweet corn (corn-on-the-cob), residue trials were also conducted in Canada.

For both compliance with MRL and estimation of dietary intake, the residue is defined as acetamiprid for plant commodities and the sum of acetamiprid and desmethyl-acetamiprid for animal commodities. The residue is not fat-soluble.

Residue Analysis*Analytical methods*

The Method KP-216 (considered suitable by the 2011 JMPR) was used as a reference for residue analysis of acetamiprid in asparagus, mustard greens and sweet corn (kernel plus cob with husk removed, forage and stover from USA trials). Briefly, the analytical methods for those crop samples involved extraction with methanol and water, clean-up by Strata-X (or Oasis HLB) solid phase extraction (SPE) and LC-MS/MS analysis. At fortification levels of 0.01, 0.1 and 1.0 mg/kg, the mean recoveries (n=3 or 6) ranged within 80–120% (CV, < 7.9%) in each sample matrix of asparagus, mustard greens, sweet corn, and kernel plus cob with husk removed. For forage and stover of sweet corn, the mean recoveries were 82–122% (CV, < 6.6%) and 87–124% (CV, < 6.1%), respectively at the three fortification levels. In all matrices, the limit of quantification (LOQ) for acetamiprid was 0.01 mg/kg.

For sweet corn samples (kernel plus cob with husk removed, forage and stover) from trials conducted in Canada, the analytical method involved extraction with methanol, partitioning with hexane and again with methylene chloride, clean-up by SPE Florisil column and LC-MS/MS analysis. At fortification levels of 0.01, 0.02, 0.1, 1 (only for stover) and 5 (only for forage) mg/kg, the mean recoveries (n=3) ranged within 76–99% (CV, < 17%). The LOQ for acetamiprid in matrices of sweet corn was 0.01 mg/kg.

Table 1 Analytical recoveries of acetamiprid in asparagus, mustard and sweet corn

Matrix	Fortification, mg/kg	n	Range of recoveries, %	Mean recovery, %	CV, %	Ref. method
Asparagus (spears)	0.01	3	84–90	86	3.7	Method KP-216
	0.1	3	80–82	81	1.8	
	1.0	3	90–92	91	1.1	

Matrix	Fortification, mg/kg	n	Range of recoveries, %	Mean recovery, %	CV, %	Ref. method
Mustard greens (leaves)	0.01	3	109–126	120	7.9	Method KP-216
	0.1	3	113–122	117	4.3	
	1.0	3	102–111	106	4.3	
	10	3	82–85	83	2.5	
Sweet corn, kernel plus cob with husk removed (USA)	0.01	6	101–120	108	6.4	Method KP-216
	0.1	3	99–109	103	5.0	
	1.0	3	91–97	93	3.4	
Sweet corn, forage (USA)	0.01	6	112–135	122	6.6	Method KP-216
	0.1	3	95–103	100	4.4	
	1.0	3	80–84	82	2.4	
Sweet corn, stover (USA)	0.01	6	106–120	113	4.4	Method KP-216
	0.1	3	119–133	124	6.1	
	1.0	3	80–99	87	11	
Sweet corn, kernel plus cob with husk removed (Canada)	0.01	3	89–93	91	2.2	
	0.02	3	88–91	89	2.2	
	0.1	3	85–86	85	1.2	
Sweet corn, forage (Canada)	0.01	3	87–119	99	17	
	0.02	3	82–85	84	2.4	
	0.1	3	81–82	81	1.2	
	5		71–80	77	7.8	
Sweet corn, stover (Canada)	0.01	3	76–103	89	16	
	0.02	3	69–82	78	10	
	0.1	3	77–95	84	11	
	1	3	74–78	76	2.6	

LOQs, < 0.01 mg/kg

In cucumber, acetamiprid residue was extracted with acetonitrile (mixed with acetic acid, 99:1). The extract aliquots were cleaned up by dispersive SPE (use of C₁₈, primary secondary amine and anhydrous magnesium sulphate) and analysed using LC-MS/MS. At fortification levels of 0.01, 0.2, 1.0 mg/kg, the mean recoveries (n=5) ranged within 89 and 101% (CV, < 9.9%). The LOQ was 0.01 mg/kg in cucumber (Li, Yiqiang; Report No. AC-01).

Acetamiprid residue in tomatoes was extracted with acetonitrile. Extract aliquots were purified by SPE using NH₂ cartridges and analysed by LC-MS/MS. At fortification levels of 0.01, 0.1, and 0.5 mg/kg, the mean recoveries (n=5) ranged within 82–95% (CV, < 5.9%). The LOQ was 0.01 mg/kg in tomatoes (Li, Zhou; Report No. AT-01).

Table 2 Analytical recoveries of acetamiprid in cucumber and tomato

Matrix	Fortification, mg/kg	n	Range of recoveries, %	Mean recovery, %	CV, %
Cucumber	0.01	5	79–98	89	9.9
	0.2	5	95–107	101	4.1
	1.0	5	95–96	96	0.5

Matrix	Fortification, mg/kg	n	Range of recoveries, %	Mean recovery, %	CV, %
Tomato	0.01	5	76–86	82	5.2
	0.1	5	86–101	95	5.9
	0.5	5	85–97	92	5.2

LOQs, < 0.01 mg/kg

Stability of residues in stored analytical samples

Stability of acetamiprid was tested for asparagus, cucumber, mustard greens, sweet corn and tomato stored frozen at or below -20°C . The residue was analysed using analytical methods described above for each matrix. Maximum tested storage durations were 426 days for asparagus, 304 days for cucumber and tomato, 382 days for mustard greens and 384–391 days for sweet corn kernel plus cob with husk removed, forage and stover samples. No zero-day residues were measured except in cucumber and tomato.

The amount of acetamiprid remaining at each storage sampling interval ranged between 72% and 120% of the nominally applied amount for all matrices. Corresponding procedural recoveries ranged 76–114%. In 2011, the JMPR concluded that acetamiprid is stable for at least 12 months in apple, cabbage, cucumber, grape and tomato, and 16 months for lettuce.

Actual storage durations of the samples from residue studies were shorter than the tested storage stability durations, with an exception of asparagus (stored 473 days, tested 426 days). Based on the available information, it is considered that acetamiprid in crop samples relevant to this submission, including asparagus, was stable until analysis.

Table 3 Storage stability of acetamiprid in plant matrices

Matrix	Fortification level, mg/kg	Tested storage days	Procedural recoveries, %	Residue in fortified samples, mg/kg	Actual max. storage days
Asparagus (spears)	1.0	426	86	0.87, 0.86, 0.85	473
Cucumber	0.1	0		0.10, 0.10, 0.10	205
		31	99, 101, 105	0.095, 0.097, 0.099	
		92	98, 101, 105	0.090, 0.096, 0.096	
		182	98, 100, 104	0.096, 0.098, 0.098	
		304	100, 101, 101	0.096, 0.097, 0.098	
Mustard greens (leaves)	1.0	382	93, 94, 106	0.87, 0.91, 0.85	382
Sweet corn, kernel plus cob with husk removed (USA)	0.1	390	95, 97, 99	0.086, 0.089, 0.093	362
Sweet corn, forage (USA)	0.1	384	86, 99, 114	0.10, 0.12, 0.12	359
Sweet corn, stover (USA)	0.1	391	102, 106, 107	0.10, 0.10, 0.096	373
Tomato	0.5	0	91, 96	0.48, 0.50, 0.50	157
		30	87, 92	0.43, 0.50, 0.53	
		95	77, 87	0.46, 0.49, 0.51	
		108	108, 113	0.38, 0.41, 0.42	
		273	83, 90	0.36, 0.40, 0.46	
		304	76, 78	0.38, 0.42, 0.58	

Sweet corn trial samples conducted in Canada were stored for up to 203 days for kernel plus cob with husk removed, 212 days for forage and 194 days for stover.

USE PATTERN

Information on the registered uses of acetamiprid made available to this Meeting is shown in Table 4.

Table 4 Registered uses of acetamiprid on crops relevant to submitted residue data

Crop	Country	Form.	Method	Application			
				Rate, kg ai/ha	Max. no.	Interval days	PHI, days
Cucumber	China	200 SP (200 g ai/L)	Spray	0.090	3		2
Tomato	China	30 ME (30 g ai/L)	Spray	0.014–0.027	2		7
Sweet corn	USA	30 SG	Foliar spray	0.11 ^a	2	14	7
				0.060 ^a	4	7	1
	Canada	70 WP	Foliar spray	0.060 ^b	2	21	10
Leafy Cole crops and turnip greens (mustard greens)	USA	30 SG, 70WP	Foliar spray	0.11 ^c	4	7	3
Asparagus	USA	30 SG, 70 WP	Foliar spray	0.11 ^d	2	10	1

Formulation: SP (soluble powder), ME (micro emulsion), WP (wetable powder), SG (soluble granule)

Leafy Cole crops and turnip greens include broccoli raab, collards, cabbage (bok choy), kale, mizuna, mustard greens, mustard spinach, rape greens, and turnip greens.

^a Do not exceed a total of 0.24 kg ai/ha/growing season; do not exceed two crop seasons per year

^b Do not exceed a total of 0.12 kg ai/ha per season

^c Do not exceed a total of 0.42 kg ai/ha/growing season

^d Do not exceed a total of 0.224 kg ai/ha/growing season

RESIDUES RESULTING FROM SUPERVISED TRIALS ON CROPS

The Meeting received residue trial data on asparagus, mustard greens and sweet corn from the USA, sweet corn from Canada, and on cucumber (including fruit cucumber) and tomato (cherry tomato) from China. Studies were conducted according to GLP or under the supervision of a study director.

All trials included one control plot and one treated plot. There was no acetamiprid detected above LOQ value, 0.01 mg/kg in control samples. In all trials, at least two samples were taken from a single treated plot. The average residue value was considered for estimation of the maximum residue level. The storage period of the field trial samples did not impact the residue levels, as described in the above section on *stability of residues in stored analytical samples*.

Crop group	Commodity	Table No.
Fruiting vegetables, Cucurbits	Cucumber	5, 6
Fruiting vegetables, other than Cucurbits	Tomato	7, 8
	Cherry tomato	9
	Sweet corn (corn-on-the-cob)	10, 11
Leafy vegetables (incl. Brassica leafy vegetables)	Mustard greens	12
Stalk and stem vegetables	Asparagus	13
Primary feed commodities	Sweet corn, forage	14, 15
	Sweet corn, stover	16, 17

*Fruiting vegetables, Cucurbits**Cucumber*

Eight residue trials on field-grown cucumbers were conducted in China (Shandong, Fujian, Jilin, Yunnan, Guangdong, Zhejiang, Hunan and Anhui) in 2013. In addition, three trials (Shandong, Fujian and Jilin) on cucumbers and fruit cucumbers were conducted under greenhouse conditions.

At each trial, one treated plot received three applications of the test substance (200 SP formulation, 200 g ai/L) 6–7 days apart. Foliar spray applications were made at growth stages of BBCH 61–71 and the application rate was 0.090 kg ai/ha. Cucumber (or fruit cucumber) in each trial was harvested 0, 1, 2, 3 and 5 days after the last application.

Two decline studies on field-grown cucumber were also conducted in the Shandong and Fujian. One application was made at a rate of 0.090 kg ai/ha and cucumber was harvested 0, 1, 3, 5, 7, 10 and 14 days after the last application.

Six samples from each trial were harvested (1.2–5 kg per sample). From the each sample, a sub sample of 200–320 g was taken and stored in a freezer at –20 °C or below. The deep-frozen sub samples were shredded in a cutter. Representative parts of the shredded samples were transferred into polystyrene box and stored at –18 °C or below until analysis. Residue analysis was made with three samples of the six.

Table 5 Residues resulting from acetamiprid application to field-grown cucumber in China (2013)

Location (Variety) Trial No./Report No.	Application						DALA	Residue, mg/kg			Mean residue, mg/kg
	kg ai/ha	n	Inter. days	L/ha	kg ai/hL	BBCH					
GAP, China	0.090	3					PHI, 2 days				
Qingdao, Shandong (Luhuang No.3) SD-01/R-AC-03	0.090	3	6–8	900	0.01	61–71	0	0.076	0.060	0.048	0.061
							1	0.051	0.062	0.080	0.064
							2	0.032	0.034	0.045	0.037
							3	0.037	0.043	0.024	0.035
							5	< 0.01	< 0.01	< 0.01	< 0.01
Qingdao, Shandong (Luhuang No.3) SD-03/R-AC-05	0.090	1		900	0.01	71	0	0.078	0.080	0.062	0.073
							1	0.097	0.061	0.067	0.075
							3	0.070	0.061	0.046	0.059 ^a
							5	0.026	0.039	0.025	0.030
							7	< 0.01	< 0.01	< 0.01	< 0.01
							10	< 0.01	< 0.01	< 0.01	< 0.01
Zhangzhou, Fujian (Jinyou No. 48) FJ-01/R-AC-06	0.090	3	7	900	0.01	61–69	0	0.10	0.11	0.16	0.12
							1	0.097	0.13	0.085	0.10
							2	0.12	0.10	0.15	0.12

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Location (Variety) Trial No./Report No.	Application						DALA	Residue, mg/kg			Mean residue, mg/kg
	kg ai/ha	n	Inter. days	L/ha	kg ai/hL	BBCH					Mean
							3	0.066	0.049	0.015	0.043
							5	0.042	0.038	0.035	0.038
Zhangzhou, Fujian (Jinyou No. 48) FJ-03/R-AC-08	0.090	1		900	0.01	71	0	0.29	0.29	0.24	0.27
							1	0.21	0.18	0.32	0.24
							3	0.13	0.17	0.097	0.13 ^a
							5	0.071	0.085	0.071	0.076
							7	< 0.01	0.046	0.035	0.030
							10	< 0.01	< 0.01	< 0.01	< 0.01
							14	< 0.01	< 0.01	< 0.01	< 0.01
Changchun, Jilin (Lvrag) JL-01/R-AC-09	0.090	3	7	900	0.01	61-69	0	0.026	0.024	0.021	0.024
							1	0.018	0.017	0.016	0.017
							2	0.020	0.021	0.019	0.020
							3	0.013	0.013	0.014	0.013
							5	< 0.01	< 0.01	< 0.01	< 0.01
Changsha, Hunan (Shuyan No. 5) HN-01/R-AC-12	0.090	3	7	900	0.01	61-69	0	0.025	0.044	0.051	0.040
							1	0.021	0.028	0.029	0.026
							2	0.012	< 0.01	0.011	0.011
							3	< 0.01	< 0.01	< 0.01	< 0.01
							5	< 0.01	< 0.01	< 0.01	< 0.01
Hangzhou, Zhejiang (Zhexiu No. 302) ZJ-01/R-AC-13	0.090	3	7	900	0.01	61-69	0	0.11	0.099	0.12	0.11
							1	0.055	0.10	0.066	0.074
							2	0.054	0.074	0.083	0.070
							3	0.058	0.069	0.053	0.060
							5	0.036	0.029	0.024	0.030
Kunming, Yunnan (Bomei No. 2) YN-01/R-AC-14	0.090	3	7	900	0.01	61-69	0	0.11	0.14	0.11	0.12
							1	0.091	0.083	0.092	0.089
							2	0.039	0.035	0.046	0.040
							3	0.037	0.040	0.034	0.037
							5	0.063	0.031	0.032	0.042
Guangzhou, Guangdong (Dadio)	0.090	3	7	900	0.01	61-69	0	< 0.01	< 0.01	< 0.01	< 0.01

Location (Variety) Trial No./Report No.	Application						DALA	Residue, mg/kg			Mean residue, mg/kg
	kg ai/ha	n	Inter. days	L/ha	kg ai/hL	BBCH					
GD-01/R-AC-15											
							1	0.036	0.028	0.034	0.033
							2	< 0.01	< 0.01	< 0.01	< 0.01
							3	0.022	0.025	0.025	0.024
							5	< 0.01	< 0.01	< 0.01	< 0.01
Hefei, Anhui (Jinyou No. 1) AH-01/R-AC-16	0.090	3	7	900	0.01	61-69	0	0.25	0.12	0.14	0.17
							1	0.13	0.11	0.14	0.13
							2	0.13	0.10	0.14	0.12
							3	< 0.01	0.13	0.082	0.074
							5	0.066	0.062	0.063	0.064

^a Higher residue value was selected for an estimation of maximum residue level.

Table 6 Residues resulting from acetamiprid application to cucumber in greenhouse in China (2013)

Location (Variety) Trial No./Report No.	Application						DALA	Residue, mg/kg			Mean residue, mg/kg
	kg ai/ha	n	Int. days	L/ha	kg ai/hL	BBCH					
GAP, China	0.090	3					PHI, 2 days				
Qingdao, Shandong (Budaojuncheng) SD-02/R-AC-04	0.090	3	7	900	0.01	61-69	0	0.11	0.13	0.15	0.13
							1	0.090	0.10	0.14	0.11
							2	0.081	0.077	0.11	0.089
							3	0.085	0.049	0.072	0.069
							5	0.018	0.037	0.019	0.025
	0.090	3	7	900	0.01	61-69	0	0.11	0.091	0.10	0.10
							1	0.052	0.052	0.069	0.058
							2	0.062	0.069	0.037	0.056
							3	0.065	0.091	0.040	0.065
							5	0.012	0.016	0.014	0.014
Zhangzhou, Fujian (Jinyou No. 10) FJ-02/R-AC-07	0.090	3	7	900	0.01	61-69	0	0.032	0.021	0.064	0.039
							1	0.038	0.022	0.031	0.030

Location (Variety) Trial No./Report No.	Application						DALA	Residue, mg/kg			Mean residue, mg/kg
	kg ai/ha	n	Int. days	L/ha	kg ai/hL	BBCH					
							2	0.019	0.045	0.041	0.035
							3	0.026	0.024	< 0.01	0.020
							5	0.026	0.016	0.014	0.019
	0.090	3	7	900	0.01	61-69	0	0.084	0.11	0.11	0.10
							1	0.11	0.026	0.087	0.074
							2	0.074	0.061	0.080	0.072
							3	0.048	0.063	0.057	0.056
							5	0.029	0.038	0.038	0.035
Shuangliao, Jilin (Jinchun No. 25) JL-02/R-AC-10	0.090	3	7	900	0.01	61-69	0	0.056	0.13	0.069	0.085
							1	0.082	0.077	0.062	0.074
							2	0.044	0.049	0.055	0.049
							3	< 0.01	0.066	0.090	0.055
							5	< 0.01	0.038	0.040	0.029
Changchun, Jilin (Shengchun) JL-03/R-AC-11	0.090	3		900	0.01	61-69	0	0.019	0.027	0.021	0.022
							1	0.018	0.018	0.014	0.017
							2	0.025	0.027	0.028	0.027
							3	0.010	0.010	< 0.01	0.01
							5	< 0.01	< 0.01	< 0.01	< 0.01

Fruiting vegetables, other than Cucurbits

Tomato, Cherry tomato

Eight residue trials on field-grown tomatoes were conducted in China (Shandong, Fujian, Jilin, Yunnan, Guangdong, Zhejiang, Hunan and Anhui) in 2013. In addition, three trials (Shandong, Fujian and Jilin) on tomatoes and cherry tomatoes each were conducted under greenhouse conditions.

At each trial, one treated plot received two foliar applications of the test substance (30 ME formulation, 30 g ai/L) 7 days apart. Foliar spray application was made at growth stages of BBCH 79 and 83 and the application rate were 0.027 kg ai/ha. Tomatoes (or cherry tomatoes) were harvested 3, 5, 7, 10 and 14 days after the last application. Residue trials on tomato and cherry tomato made under greenhouse conditions were carried out in the same site of each region and at the same application time.

Two decline studies on field-grown tomato were also conducted in the Shandong and Fujian regions of China. One application was made at a rate of 0.041 kg ai/ha and tomato was harvested 0, 1, 3, 5, 7, 10, 14, 21, 28 and 35 days after the last application.

Six samples from each trial were harvested (1.2–4 kg per sample). From each sample, a sub sample of 132–400 g was taken and the sub samples were shredded in a food processor. Representative parts of the shredded samples were then transferred into polystyrene boxes and stored at –18 °C or below until analysis. Residue analysis was made with three samples of the six.

Table 7 Residues resulting from acetamiprid application to field-grown tomatoes in China (2013)

Location (Variety) Trial No./Report No.	Application						DALA	Residue, mg/kg			Mean residue, mg/kg
	kg ai/ha	n	Inter. days	L/ha	kg ai/hL	BBCH					
GAP, China	0.027	2					PHI, 7 days				
Qingdao, Shandong (Qingyan No. 1) FTAT-SD-01/AT-03	0.027	2	7	900	0.003	79, 83	3	0.031	0.024	0.027	0.027
							5	0.021	0.023	0.026	0.023
							7	0.017	0.021	< 0.01	0.016
							10	0.018	0.019	0.022	0.020
							14	0.013	0.016	< 0.01	0.013
Qingdao, Shandong (Qingyan No. 1) FTAT-SD-02/AT-03	0.041	1		900	0.005	79	0	0.015	0.032	0.020	0.022
							1	0.026	0.038	0.020	0.028
							3	0.011	0.023	0.012	0.015
							5	< 0.01	0.020	0.015	0.015
							7	0.021	0.012	0.015	0.016
							14	< 0.01	0.011	< 0.01	0.010
							21	< 0.01	< 0.01	< 0.01	< 0.01
							28	< 0.01	< 0.01	< 0.01	< 0.01
							35	< 0.01	< 0.01	< 0.01	< 0.01
Zhangzhou, Fujian (Yifeng) FTAT-FJ-01/AT-04	0.027	2	7	1,110	0.002	79, 83	3	0.011	0.018	0.014	0.014
							5	0.021	0.015	0.020	0.019
							7	0.014	0.025	0.026	0.022
							10	0.016	0.019	0.012	0.016
							14	0.011	< 0.01	0.012	0.011
Zhangzhou, Fujian (Yifeng) FTAT-FJ-02/AT-04	0.041	1		1,110	0.004	79	0	0.028	0.020	0.029	0.026
							1	0.018	0.024	0.017	0.020
							3	0.029	0.014	0.017	0.020
							5	0.020	0.015	0.021	0.019

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Location (Variety) Trial No./Report No.	Application						DALA	Residue, mg/kg			Mean residue, mg/kg
	kg ai/ha	n	Inter. days	L/ha	kg ai/hL	BBCH					
							7	0.013	< 0.01	0.017	0.013
							14	0.012	0.010	0.010	0.011
							21	< 0.01	< 0.01	< 0.01	< 0.01
							28	< 0.01	< 0.01	< 0.01	< 0.01
							35	< 0.01	< 0.01	< 0.01	< 0.01
Changchun, Jilin (Jiafen No. 15) FTAT-JL-01/AT-05	0.027	2	7	900	0.003	79, 83	3	0.014	0.015	0.013	0.014
							5	0.011	0.011	0.011	0.011
							7	0.011	0.010	0.010	0.010
							10	0.011	0.011	< 0.01	0.011
							14	< 0.01	< 0.01	< 0.01	< 0.01
Kunming, Yunnan (Jingang) FTAT-YN-01/AT-06	0.027	2	7	800	0.003	79, 83	3	0.015	0.016	0.015	0.015
							5	0.023	0.023	0.027	0.024
							7	0.014	0.010	0.012	0.012
							10	0.011	< 0.01	0.011	0.011
							14	0.010	0.011	< 0.01	0.010
Guangzhou, Guangdong (Naishuhong) FTAT-GD-01/AT-07	0.027	2	7	1,000	0.003	79, 83	3	0.048	0.049	0.044	0.047
							5	0.039	0.052	0.035	0.042
							7	0.030	0.013	0.023	0.022
							10	0.028	0.019	0.017	0.021
							14	< 0.01	< 0.01	< 0.01	< 0.01
Hangzhou, Zhejiang (903#) FTAT-ZJ-01/AT-08	0.027	2	7	900	0.003	79, 83	3	< 0.01	< 0.01	0.013	0.011
							5	< 0.01	< 0.01	< 0.01	< 0.01
							7	< 0.01	< 0.01	< 0.01	< 0.01
							10	< 0.01	< 0.01	< 0.01	< 0.01
							14	< 0.01	< 0.01	< 0.01	< 0.01
Changsha, Hunan (Xianghong No. 5) FTAT-HN-01/AT-09	0.027	2	7	1,333	0.002	79, 83	3	< 0.01	0.011	0.014	0.012
							5	< 0.01	< 0.01	< 0.01	< 0.01
							7	< 0.01	< 0.01	0.012	0.011
							10	< 0.01	< 0.01	< 0.01	< 0.01
							14	< 0.01	< 0.01	< 0.01	< 0.01

Location (Variety) Trial No./Report No.	Application						DALA	Residue, mg/kg			Mean residue, mg/kg
	kg ai/ha	n	Inter. days	L/ha	kg ai/hL	BBCH					
Hefei, Anhui (Hezuo No. 908) FTAT-AH-01/AT-10	0.027	2	7	1,100	0.002	79, 83	3	0.053	0.063	0.040	0.052
							5	0.039	0.026	0.036	0.034
							7	0.027	0.023	0.026	0.025
							10	0.018	0.018	0.018	0.018
							14	0.013	0.016	0.013	0.014

30 ME (micro emulsion, 30%) formulation was used

BBCH79, 83:30% of fruits show typically fully ripe colour

Table 8 Residues resulting from acetamiprid application to tomatoes in greenhouse in China (2013)

Location (Variety) Trial No./Report No.	Application						DALA	Residue, mg/kg			Mean residue, mg/kg
	kg ai/ha	n	Inter. days	L/ha	kg ai/hL	BBCH					
GAP, China	0.027	2					PHI, 7 days				
Qingdao, Shandong (Fensha) FTAT-SD-03/AT-11	0.027	2	7	1,300	0.002	79, 83	3	0.039	0.026	0.031	0.032
							5	0.027	0.019	0.032	0.026
							7	0.028	0.027	0.027	0.027
							10	0.019	0.018	0.020	0.019
							14	0.019	0.013	0.015	0.016
Zhangzhou, Fujian (Israel No. 318) FTAT-FJ-03/AT-12	0.027	2	7	900	0.003	79, 83	3	0.011	< 0.01	< 0.01	0.011
							5	< 0.01	< 0.01	< 0.01	< 0.01
							7	< 0.01	< 0.01	< 0.01	< 0.01
							10	< 0.01	< 0.01	< 0.01	< 0.01
							14	< 0.01	< 0.01	< 0.01	< 0.01
Changchun, Jilin (Jiafen No. 15) FTAT-JL-02/AT-13	0.027	2	7	900	0.003	79, 83	3	0.013	0.014	0.014	0.014
							5	0.011	0.014	0.011	0.012
							7	< 0.01	< 0.01	< 0.01	< 0.01
							10	0.010	< 0.01	0.010	0.010
							14	0.023	0.010	0.012	0.015

Table 9 Residues resulting from acetamiprid application to cherry tomatoes in greenhouse in China (2013)

Location (Variety) Trial No./Report No.	Application						DALA	Residue, mg/kg				Mean residue, mg/kg
	kg ai/ha	n	Inter. days	L/ha	kg ai/hL	BBCH						
GAP, China	0.027	2					PHI, 7 days					
Qingdao, Shandong (Caiyu No. 3) FTAT-SD-04/AT-14	0.027	2	7	1,300	0.002	79, 83	3	0.057	0.050	0.054	0.054	
							5	0.065	0.060	0.054	0.060	
							7	0.051	0.043	0.055	0.050	
							10	0.050	0.042	0.041	0.044	
							14	0.046	0.039	0.042	0.042	
Zhangzhou, Fujian (Israel No. 318) FTAT-FJ-04/AT-15	0.027	2	7	900	0.003	79, 83	3	0.019	0.016	0.013	0.016	
							5	0.018	< 0.01	0.017	0.018	
							7	< 0.01	0.010	0.012	0.011	
							10	0.016	0.016	0.022	0.018	
							14	0.021	0.014	0.020	0.018	
Changchun, Jilin (Taiwan Shengnv) FTAT-JL-03/AT-16	0.027	2	7	900	0.003	79, 83	3	0.030	0.032	0.027	0.030	
							5	0.022	0.025	0.032	0.026	
							7	0.024	0.022	0.018	0.021	
							10	0.019	0.020	0.022	0.020	
							14	< 0.01	0.011	< 0.01	0.010	

Sweet corn (corn-on-the-cob)

Eight trials were conducted in Canada (ON, BC, QC and AB) in 2006. At each site, sweet corn plants were treated with four applications (70 WP formulation, broadcast foliar spray) 6–8 days apart. The application rate ranged from 0.059 to 0.063 kg ai/ha (total, 0.24 to 0.25 kg ai/ha/season), with the exception of Trial No. 138. In that trial, the first three applications were made at 0.083–0.087 kg ai/ha and the fourth application was made at 0.060 kg ai/ha (total, 0.32 kg ai/ha/season) due to calculation error. Samples of kernel plus cob with husk removed were collected 1–2 days after the last application. At Trial No. 131, additional samples were collected 0, 3 and 7 days after the last application.

In addition, seven trials were conducted in the USA (CA, FL, GA, ID, NY, SC and WI) in 2009. One treated plot received four foliar applications of the test substance (30 SG formulation) 6–8 days apart, except in the GA*14 trial in which the intervals were as short as 4 days. The application rates were in the range 0.059 to 0.064 kg ai/ha (total, 0.24 to 0.25 kg ai/ha/season). A second treated plot received two foliar applications of the test substance (30 SG formulation) 12–16 days apart. The application rates were in the range 0.11 to 0.12 kg ai/ha (total, 0.22 to 0.24 kg ai/ha/season).

Samples of kernel plus cob with husk removed were collected one day from the four application plot and 5–8 days from the two application plot, after the last application.

Table 10 Residues resulting from acetamiprid application to sweet corn in Canada in 2006 (Report: AAFC06-034R)

Location (Variety)	Application			DALA	Residue, mg/kg	Mean residue, mg/kg	Trial No.
	kg ai/ha	n	Inter. days				
GAP, USA	0.11	2	14	PHI, 7 days			
	0.060	4	7	PHI, 1 days			
Delhi, ON (Fleet Bicolor)	0.060–0.061	4	7–8	0	< 0.01, < 0.01	< 0.01	131
				1	< 0.01, < 0.01	< 0.01	
				3	< 0.01, < 0.01	< 0.01	
				7	< 0.01, < 0.01	< 0.01	
Delhi, ON (Lancelot Bicolor)	0.061–0.063	4	7	1	< 0.01, < 0.01	< 0.01	132
London, ON (Trinity Bicolor)	0.060–0.061	4	7	1	< 0.01, < 0.01	< 0.01	133
London, ON (Accord)	0.060–0.061	4	7	1	< 0.01, < 0.01	< 0.01	134
Agassiz, BC (Gourmet Sweet Brand 276A)	0.059–0.061	4	7	2	< 0.01, < 0.01	< 0.01	135
L'Acadie, QC (Fleet)	0.059–0.062	4	7	1	< 0.01, < 0.01	< 0.01	136
L'Acadie, QC (Trinity)	0.059–0.062	4	7	1	< 0.01, < 0.01	< 0.01	137
Taber, AB (XtraSweet 82)	0.060–0.087 ^a		6–8	1	< 0.01, < 0.01	< 0.01	138

70 WP formulation was used; residue in kernel plus cob with husk removed was analysed.

^a The first three applications were over applied due to calculation error (1st, 0.086 kg ai/ha; 2nd, 0.083 kg ai/ha; 3rd 0.087 kg ai/ha; 4th, 0.060 kg ai/ha).

Table 11 Residues resulting from acetamiprid application to sweet corn in the USA in 2009 (Report: IR-4 PR No. 10216)

Location (Variety)	Application			DALA	Residue, mg/kg	Mean residue, mg/kg	Trial No.
	kg ai/ha	n	Inter. days				
GAP, USA	0.11	2	14	PHI, 7 days			
	0.060	4	7	PHI, 1 days			
Holtville, CA (Boreal)	0.11, 0.11	2	16	7	< 0.01, < 0.01	< 0.01	CA102
	0.059–0.061	4	6–8	1	< 0.01, < 0.01	< 0.01	
Citra, FL	0.11, 0.11	2	14	7	< 0.01, < 0.01	< 0.01	FL04

Location (Variety)	Application			DALA	Residue, mg/kg	Mean residue, mg/kg	Trial No.
	kg ai/ha	n	Inter. days				
(Obsession (SH2 bicolor))							
	0.059	4	7	1	< 0.01, < 0.01	< 0.01	
Tifton, GA (XTRA-Tender Brand 270A F1 bicolor Super Sweet)	0.11, 0.11	2	12	5	< 0.01, < 0.01	< 0.01	GA*14
	0.061–0.062	4	4–7	1	< 0.01, < 0.01	< 0.01	
Kimberly, ID (Bodacious)	0.11, 0.11	2	13	7	< 0.01, < 0.01	< 0.01	ID17
	0.061–0.062	4	6–7	1	< 0.01, < 0.01	< 0.01	
North Rose, NY (Attribute)	0.11, 0.11	2	14	7	< 0.01, < 0.01	< 0.01	NY14
	0.061	4	7	1	< 0.01, < 0.01	< 0.01	
Charleston, SC (Accelerator)	0.12, 0.12	2	14	8	< 0.01, < 0.01	< 0.01	SC*01
	0.061–0.064	4	7	1	< 0.01, < 0.01	< 0.01	
Arlington, WI (Jubilee Supersweet)	0.12, 0.12	2	14	8	< 0.01, < 0.01	< 0.01	WI15
	0.061–0.063	4	7	1	< 0.01, < 0.01	< 0.01	

30 SG (30% soluble granule) formulation was used; residue in kernel plus cob with husk removed was analysed.

Leafy vegetables (incl. Brassica leafy vegetables)

Mustard greens

Eight supervised residue trials were conducted in the USA (AR, CA, GA, NC, OH, SC and TX) in 2009. At each trial, four foliar applications of the test substance (70 WP) were made 6–8 days apart, except in the GA*06 trial where a fifth application was needed because the crop was not mature after four applications. The application rates were in the range of 0.083–0.12 kg ai/ha/application. The total rate range per growing season was 0.42–0.43 kg ai/ha (GA*06 trial, 0.53 kg ai/ha). A non-ionic surfactant was included in the tank mix for each application. Samples of mustard green leaves were collected 2–4 days after the last application

Table 12 Residues resulting from acetamiprid application to mustard greens in the USA in 2009 (Report: IR-4 PR No. 09271)

Location (Variety) Year	Application			DALA	Residue, mg/kg	Mean residue, mg/kg	Trial No.
	kg ai/ha	n	Inter. days				
GAP, USA	0.11	4	7	PHI, 3 days			
Alma, AR (Florida Broadleaf)	0.085–0.12	4	6–8	3	8.4, 10	9.2	AR07
Salinas, CA (Red Giant)	0.084–0.12	4	7–8	3	2.4 2.9	2.7	CA*51
Salinas, CA (Green Wave)	0.087–0.12	4	7	4	1.5, 1.6	1.6	CA*52
Tifton, GA (Florida Broadleaf)	0.083–0.11	5 ^a	7–8	3	2.1, 2.2	2.2	GA*06
Clinton, NC (Southern Giant Curled)	0.083–0.11	4	7–8	4	1.2, 1.2	1.2	NC10

Location (Variety) Year	Application			DALA	Residue, mg/kg	Mean residue, mg/kg	Trial No.
	kg ai/ha	n.	Inter. days				
Willard, OH (Green Wave)	0.090–0.12	4	7	2	0.20, 0.40	0.30	OH*04
Charleston, SC (Florida Broadleaf)	0.085–0.11	4	6–8	3	1.4, 2.0	1.7	SC*03
Weslaco, TX (Florida Broadleaf)	0.087–0.12	4	6–7	2	2.4, 2.4	2.4	TX*19

70 WP (70% wettable powder) was applied in all trials.

CA*51 and CA*52 trials were conducted two months apart.

^a Extra treatment was made as samples were maturing too slowly due to excessive rain. A total rate was 0.53 kg ai/ha/season.

Stalk and stem vegetables

Asparagus

Eight supervised residue trials were conducted in the USA (CA, ID, MD, MI, WA) in 2008 and 2009. At each trial, two applications of the test substance (70 WP) were made 10–14 days apart. The application rates were in the range of 0.11–0.12 kg ai/ha/application. Non-ionic surfactant was included in the tank mix in trials CA34, ID05, MI33, MI34 and in the second application of WA06. Samples of asparagus spears were harvested one day after the last application. One decline study (CA37 trial) was conducted and samples were collected 0, 1, 4, 8 and 11 days after the last application.

Table 13 Residues resulting from acetamiprid application to asparagus in the USA (Report: IR-4 PR No. 09939)

Location (Variety) Year	Application			DALA	Residue, mg/kg	Mean residue, mg/kg	Trial No.
	kg ai/ha	n	Inter. days				
GAP, USA	0.11	2	10	PHI, 1 days			
San Ardo, CA (UC157) 2009	0.11, 0.12	2	10	1	0.21, 0.21	0.21	CA34
Merritt, CA (Apollo) 2008	0.11, 0.11	2	14	1	0.16, 0.16	0.16	CA35*
Merritt, CA (Apollo) 2008	0.11, 0.11	2	14	0	0.25, 0.25	0.25	CA37*
				1	0.26, 0.26	0.26	
				4	0.08, 0.08	0.08	
				8	0.01, 0.01	0.01	
				11	< 0.01, < 0.01	< 0.01	
Marsing, ID (Jersey King) 2008	0.11, 0.11	2	12	1	0.38, 0.43	0.41	ID05
Sailsbury, MD (Jersey Knight) 2008	0.11, 0.11	2	11	1	0.11, 0.13	0.12	MD17
East Lansing, MI (Jersey Giant) 2008	0.11, 0.11	2	12	1	0.28, 0.29	0.29	MI33
East Lansing, MI (Jersey Giant) 2008	0.11, 0.12	2	12	1	0.26, 0.26	0.26	MI34
Eltopia, WA (Jersey Knight) 2008	0.11, 0.11	2	13	1	0.25, 0.27	0.26	WA06

70 WP (70% wettable powder) was applied in all trials.

CA35* and CA37* trials were conducted at the same site however application was made 7 days apart. These trials were considered as independent as asparagus is shortly grown for 7 days.

*Primary feed commodities**Sweet corn, forage and stover*

Residue trials on sweet corn were conducted in Canada (eight trials in 2006) and the USA (seven trials in 2009). Application methods of test substance are described above in food commodity of sweet corn (corn-on-the-cob). Forage samples were collected on the same day as harvesting samples of kernel plus cob with husk removed in both Canada and USA.

For stover in Canada, samples (stalks with ear removed) were collected 38–89 days after the last application. This was a period after the ears were harvested and allowed to dry, free-standing in the field.

In the USA, stover samples were collected concurrently with sampling of forage (except Trial No. NY14). The samples (stalks with ear removed) were cut and dried (either in the field or in a sheltered area/low temperature “oven”). In the NY14 trial, stover samples were not cut and were allowed to dry in the field before being harvested. Harvesting was 35 days and 28 days after four and two applications of the test substance, respectively.

Table 14 Residues on forage resulting from acetamiprid application to sweet corn in Canada in 2006 (Report: AAFC06-034R)

Location (Variety)	Application			DALA	Residue, mg/kg	Mean residue, mg/kg	Trial No.
	kg ai/ha	n	Inter. days				
GAP, USA	0.11	2	14	PHI, 7 days			
	0.060	4	7	PHI, 1 days			
Delhi, On (Fleet Bicolor)	0.060–0.061	4	7–8	0	0.50, 0.72	0.61	131
				1	0.62, 0.87	0.75	
				3	0.20, 0.28	0.24	
				7	0.10, 0.17	0.14	
Delhi, On (Lancelot Bicolor)	0.061–0.063	4	7	1	0.43, 0.60	0.52	132
London, ON (Trinity Bicolor)	0.060–0.061	4	7	1	0.23, 0.25	0.24	133
London, ON (Accord)	0.060–0.061	4	7	1	0.60, 0.62	0.61	134
Agassiz, BC (Gourmet Sweet Brand 276A)	0.059–0.061	4	7	2	0.60, 0.62	0.61	135
L'Acadie, QC (Fleet)	0.059–0.062	4	7	1	1.0, 1.1	1.1	136
L'Acadie, QC (Trinity)	0.059–0.062	4	7	1	0.52, 0.62	0.57	137
Taber, AB (XtraSweet 82)	0.060–0.087 ^a	4	6–8	1	0.48, 0.49	0.49	138

70 WP formulation was used.

^a The first three applications were over applied due to calculation error (1st, 0.086 kg ai/ha; 2nd, 0.083 kg ai/ha; 3rd 0.087 kg ai/ha; 4th, 0.060 kg ai/ha).

Table 15 Residues on forage resulting from acetamiprid application to sweet corn in the USA in 2009 (Report: IR-4 PR No. 10216)

Location (Variety)	Application			DALA	Residue, mg/kg	Mean residue, mg/kg	Trial No.
	kg ai/ha	No.	Inter. days				
GAP, USA	0.11	2	14	PHI, 7 days			
	0.060	4	7	PHI, 1 days			
Holtville, CA (Boreal)	0.11, 0.11	2	16	7	8.1, 10	9.1	CA102
	0.059-0.061	4	6-8	1	6.5, 8.1	7.3	
Citra, FL (Obsession (SH2 bicolor))	0.11, 0.11	2	14	7	0.39, 0.43	0.41	FL04
	0.059	4	7	1	0.42, 0.65	0.54	
Tifton, GA (XTRA-Tender Brand 270A F1 bicolor Super Sweet)	0.11, 0.11	2	12	5	0.68, 0.84	0.76	GA*14
	0.061-0.062	4	4-7	1	0.83, 0.87	0.85	
Kimberly, ID (Bodacious)	0.11, 0.11	2	13	7	4.4, 4.9	4.7	ID17
	0.061-0.062	4	6-7	1	5.8, 6.7	6.3	
North Rose, NY (Attribute)	0.11, 0.11	2	14	7	2.1, 2.8	2.4	NY14
	0.061	4	7	1	0.95, 1.4	1.2	
Charleston, SC (Accelerator)	0.12, 0.12	2	14	8	1.2, 1.5	1.4	SC*01
	0.061-0.064	4	7	1	1.2, 1.3	1.3	
Arlington, WI (Jubilee Supersweet)	0.12, 0.12	2	14	8	1.4, 1.4	1.4	WI15
	0.061-0.063	4	7	1	3.2, 3.5	3.4	

30 SG (30% soluble granule) formulation was used.

Table 16 Residues on stover resulting from acetamiprid application to sweet corn in Canada in 2006 (Report: AAFC06-034R)

Location (Variety)	Application			DALA	Residue, mg/kg	Mean residue, mg/kg	Trial No.
	kg ai/ha	No.	Inter. days				
GAP, USA	0.11	2	14	PHI, 7 days			
	0.060	4	7	PHI, 1 days			
Delhi, On (Fleet Bicolor)	0.060-0.061	4	7-8	70	0.030, 0.035	0.033	131
				76	0.029, 0.047	0.038	
				83	0.015, 0.017	0.016	

Location (Variety)	Application			DALA	Residue, mg/kg	Mean residue, mg/kg	Trial No.
	kg ai/ha	No.	Inter. days				
				90	0.018, 0.018	0.018	
Delhi, On (Lancelot Bicolor)	0.061–0.063	4	7	83	0.029, 0.034	0.032	132
London, ON (Trinity Bicolor)	0.060–0.061	4	7	89	< 0.01, 0.016	0.013	133
London, ON (Accord)	0.060–0.061	4	7	82	< 0.01, < 0.01	< 0.01	134
Agassiz, BC (Gourmet Sweet Brand 276A)	0.059–0.061	4	7	43	0.16, 0.17	0.17	135
L'Acadie, QC (Fleet)	0.059–0.062	4	7	41	0.13, 0.19	0.16	136
L'Acadie, QC (Trinity)	0.059–0.062	4	7	41	0.20, 0.23	0.22	137
Taber, AB (XtraSweet 82)	0.060–0.087 ^a		6–8	38	0.76, 0.94	0.85	138

70 WP formulation was used. Residues are expressed on a dry matter basis, ca. 83%.

^a The first three applications were over applied due to calculation error (1st, 0.086 kg ai/ha; 2nd, 0.083 kg ai/ha; 3rd 0.087 kg ai/ha; 4th, 0.060 kg ai/ha).

Table 17 Residues on stover resulting from acetamiprid application to sweet corn in the USA in 2009 (Report: IR-4 PR No. 10216)

Location (Variety)	Application				DALA	Moisture content (%)	Residue, mg/kg	Mean residue, mg/kg	Trial No.
	kg ai/ha	No.	Growth stage	Inter. days					
GAP, USA	0.11	2		14	PHI, 7 days				
	0.060	4		7	PHI, 1 days				
Holtville, CA (Boreal)	0.11, 0.11	2	Early silk Ears	16	7	15–20	19, 21	20	CA102
	0.059–0.061	4	Early silk Ear fill Ears Mature ears	6–8	1		15, 16	16	
Citra, FL (Obsession (SH2 bicolor))	0.11, 0.11	2	Corn ear stage Corn ear stage	14	7	20	0.21, 0.21	0.21	FL04
	0.059	4	Corn ear stage Corn ear stage	7	1		0.12, 0.26	0.19	

Location (Variety)	Application				DALA	Moisture content (%)	Residue, mg/kg	Mean residue, mg/kg	Trial No.
	kg ai/ha	No.	Growth stage	Inter. days					
			Corn ear stage						
			Corn ear stage						
Tifton, GA (XTRA-Tender Brand 270A F1 bicolor Super Sweet)	0.11, 0.11	2	Fruiting	12	5	15-20	2.7, 3.0	2.8	GA*14
			Fruiting						
	0.061-0.062	4	Fruiting	4-7	1		3.3, 4.9	4.1	
			Fruiting						
			Fruiting						
			Fruiting						
Kimberly, ID (Bodacious)	0.11, 0.11	2	Ear growth	13	7	17	8.0, 8.7	8.4	ID17
			Maturing						
	0.061-0.062	4	Ear growth	6-7	1		10, 13	12	
			Ear growth						
			Maturing						
			Maturing						
North Rose, NY (Attribute)	0.11, 0.11	2	Early silk	14	35	-	0.43, 0.46	0.45	NY14
			Brown silk						
	0.061	4	Early silk	7	28		0.33, 0.53	0.43	
			Early kernel formation						
			Brown silk						
			Commercially fresh ears						
Charleston, SC (Accelerator)	0.12, 0.12	2	Blooming	14	8	15-20	2.4, 3.1	2.8	SC*01
			Fruiting						
	0.061-0.064	4	Blooming	7	1		3.0, 3.4	3.2	
			Fruiting						
			Fruiting						
			Fruiting						
Arlington, WI (Jubilee Supersweet)	0.12, 0.12	2	Reproductive	14	8	20	2.5, 2.6	2.6	WI15
			Reproductive						
	0.061-0.063	4	Reproductive	7	1		4.3, 5.2	4.8	
			Reproductive						
			Reproductive						
			Reproductive						

30 SG (30% soluble granule) formulation was used. Residues are expressed on a dry matter.

APPRAISAL

Acetamiprid was evaluated for the first time by the 2011 JMPR, where an ADI of 0–0.07 mg/kg bw and an ARfD of 0.1 mg/kg bw were established and maximum residue levels were recommended for a range of plant and animal commodities. The compound was re-evaluated by the 2012 JMPR.

At the Forty-sixth Session of the CCPR (2014), acetamiprid was listed for residue evaluation for additional maximum residue levels by the 2015 JMPR. The Meeting received information on supervised residue trials for asparagus, cucumber, mustard greens, sweet corn (corn-on-the-cob) and tomato including cherry tomatoes.

For both compliance with MRL and estimation of dietary intake, the residue is defined as acetamiprid for plant commodities, and the sum of acetamiprid and desmethyl-acetamiprid for animal commodities. The residue is not fat-soluble.

Methods of analysis

Acceptable analytical methods were developed and validated for determination of acetamiprid in asparagus, mustard greens and sweet corn. These methods were based on Method KP-216 which was considered suitable by 2011 JMPR. Other analytical methods used for sweet corn, cucumber and tomato were also fully validated. All methods used analysis by LC-MS/MS and the limits of quantification (LOQs) were 0.01 mg/kg in all matrices.

Stability of residues in stored analytical samples

In 2011, JMPR concluded that acetamiprid is stable for at least 12 months in apple, cabbage, cucumber and 16 months for lettuce.

The present Meeting received acetamiprid stability studies on asparagus, cucumber, mustard greens, sweet corn and tomato, showing that residues were stable under frozen condition for at least 426 days for asparagus, 304 days for cucumber and tomato, 382 days for mustard greens and 384–391 days for sweet corn samples (kernel plus cob with husk removed, forage and stover).

Based on the available storage stability information, the Meeting concluded that acetamiprid was stable for the period of actual storage days associated with the submitted residue trials.

Results of supervised residue trials on crops

Fruiting vegetables, Cucurbits

Cucumber

Supervised trials were conducted in China in 2013, matching the China GAP on cucumber (3 sprays applications at 0.090 kg ai/ha and a PHI of 2 days). Eight trials were conducted under field conditions. Another six trials were conducted under greenhouse conditions, two trials of which were not independent and another two trials were also not independent. Additionally, two decline studies on field-grown cucumber were conducted with one application at a rate of 0.090 kg ai/ha. The residues decreased with a half-life of 2.1 or 3.9 days.

From residue trials matching the China GAP on cucumber, acetamiprid residue values were as follows:

Field-grown cucumber (n=8): 0.011, 0.020, 0.024, 0.042, 0.059, 0.070, 0.12 and 0.13 mg/kg.

Greenhouse-grown cucumber (n=4): 0.027, 0.055, 0.072 and 0.089 mg/kg.

As the residue distributions of acetamiprid between field-grown and greenhouse-grown cucumber were similar, residue values were combined (n=12): 0.011, 0.020, 0.024, 0.027, 0.042, 0.055, 0.059, 0.070, 0.072, 0.089, 0.12 and 0.13 mg/kg.

The Meeting estimated a maximum residue level of 0.3 mg/kg, an STMR of 0.057 mg/kg and an HR of 0.17 mg/kg (based on a highest single sample) for cucumber.

Further, the Meeting withdrew its previous recommendations for Fruiting vegetables, Cucurbits and estimated a maximum residue level of 0.2 mg/kg, an STMR of 0.05 mg/kg and an HR of 0.11 mg/kg for Fruiting vegetables, Cucurbits (except cucumber).

Fruiting vegetables, other than Cucurbits

Tomato

Supervised trials were conducted in China in 2013, matching the China GAP on tomato (2 sprays at 0.027 kg ai/ha and a PHI of 7 days). Eight trials on tomato were conducted under field conditions and an additional three trials on each of tomato and cherry tomato were conducted under greenhouse conditions. Additionally, two decline studies on field-grown tomato were conducted with one application at a rate of 0.041 kg ai/ha. The residues decreased with an average half-life of 11.6 days.

From residues trials matching the China GAP on tomato, acetamiprid residue values were as follows:

Field-grown tomato (n=8): < 0.01, 0.011, 0.011, 0.012, 0.020, 0.022, 0.022 and 0.025 mg/kg.

Greenhouse-grown tomato (n=3): < 0.01, 0.015 and 0.027 mg/kg.

Greenhouse-grown cherry tomato (n=3): 0.018, 0.021 and 0.050 mg/kg.

The 2011 JMPR recommended a maximum residue level of 0.2 mg/kg, an STMR of 0.04 mg/kg and an HR of 0.14 mg/kg for Fruiting vegetables, other than Cucurbits, based on residues in tomato (outdoor), sweet pepper and chili pepper conducted according to the US GAP (four foliar applications at 0.084 kg ai/ha and a PHI of 7 days). Since the authorization in the US represents the critical GAP, this Meeting confirmed its previous recommendations for Fruiting vegetables, other than Cucurbits (except sweet corn & mushrooms).

Sweet corn

Seven trials were conducted in the USA in 2009, matching a critical US GAP (two foliar sprays at 0.11 kg ai/ha with a 14-day retreatment interval and a PHI of 7 days). Residue concentrations in sweet corn (kernel plus cob with husk removed) from the USA trials were all < 0.01 mg/kg (n=7).

The Meeting estimated a maximum residue level of 0.01* mg/kg, an STMR of 0.01 mg/kg and an HR of 0.01 mg/kg for sweet corn (corn-on-the-cob).

Leafy vegetables (including Brassica leafy vegetables)

Mustard greens

Eight trials on mustard greens were conducted in the USA in 2009, matching the US GAP (four foliar sprays at 0.11 kg ai/ha with a 7-day retreatment interval and a PHI of 3 days).

Acetamiprid residues in mustard greens were (8): 0.30, 1.2, 1.6, 1.7, 2.2, 2.4, 2.7 and 9.2 mg/kg.

The Meeting estimated a maximum residue level of 15 mg/kg, an STMR of 2.0 mg/kg and an HR of 10 mg/kg (based on highest single sample) for mustard greens. However, this would result in an exceedance of the ARfD and an alternative GAP for mustard greens was not identified.

*Stalk and stem vegetables**Asparagus*

Eight trials on asparagus were conducted in the USA in 2008 and 2009, matching the US GAP (two sprays at 0.11 kg ai/ha with a 10-day retreatment interval and a PHI of 1 day).

Acetamiprid residues in asparagus were (n=8): 0.12, 0.16, 0.21, 0.26 (3), 0.29 and 0.41 mg/kg.

The Meeting estimated a maximum residue level of 0.8 mg/kg, an STMR of 0.26 mg/kg and an HR of 0.43 mg/kg (based on highest single sample) for asparagus.

*Primary feed commodities**Sweet corn forage and stover*

The trial conditions are described under the food commodity. For feed commodity, sweet corn forage and stover samples were harvested in the seven USA trials. In one trial, the PHI in sampling of stover did not match the US GAP.

Acetamiprid residues in sweet corn forage were (n=7): 0.41, 0.76, 1.4, 1.4, 2.4, 4.7 and 9.1 mg/kg.

Acetamiprid residues in sweet corn stover were (n=6): 0.21, 2.6, 2.8, 2.8, 8.4 and 20 mg/kg.

The Meeting estimated a median residue of 1.4 mg/kg and highest residue of 9.1 mg/kg for sweet corn forage.

The Meeting estimated a maximum residue level of 40 mg/kg, median residue level of 2.8 mg/kg and highest residue of 20 mg/kg on a dry weight basis for sweet corn stover.

*Residues in animal commodities**Livestock dietary burden*

Dietary burden calculations considered by the current Meeting for beef cattle and dairy cattle, incorporating sweet corn, are presented in Annex 6. Dietary burdens for poultry were not calculated as sweet corn (forage, stover and cannery waste) is not a relevant feed item.

The dietary burdens for beef cattle and dairy cattle were estimated using OECD diets listed in Appendix IX of the 2009 edition of the FAO Manual.

Summary of cattle dietary burdens (ppm of dry matter diet)

	US-Canada		EU		Australia	
	max	mean	max	mean	max	mean
Beef cattle	1.1	0.29	0.83	0.28	18 ^a	2.7 ^b
Dairy cattle	9.5 ^c	1.6	0.84	0.29	9.0	1.7 ^d

^a Highest maximum beef or dairy cattle dietary burden suitable for maximum residue level estimates for mammalian meat and edible offal

^b Highest mean beef or dairy cattle dietary burden suitable for STMR estimates for mammalian meat and edible offal

^c Highest maximum dairy cattle dietary burden suitable for maximum residue level estimates for milk

^d Highest mean dairy cattle dietary burden suitable for STMR estimates for milk

Animal commodity maximum residue levels

Livestock feeding studies involving administration of acetamiprid to dairy cows were reported in the 2011 JMPR Report.

Estimated maximum and mean dietary burdens were 18 ppm and 2.7 ppm for beef cattle and 9.5 ppm and 1.7 ppm for dairy cattle, respectively. The calculation to estimate total residues

(acetamiprid plus desmethyl-acetamiprid) for maximum residue levels, STMR and HR values are shown below.

	Feed level (ppm) for milk residues	Residues (mg/kg) in milk	Feed level (ppm) for tissue residues	Residues (mg/kg) in			
				Muscle	Liver	Kidney	Fat
Maximum residue level beef or dairy cattle							
Feeding study ^a	5.77	0.063					
	17.4	0.209	17.4	0.289	0.64	0.86	0.153
Dietary burden and residue estimate	9.5	0.11	18	0.30	0.67	0.89	0.16
STMR beef or dairy cattle							
Feeding study ^b	5.77	0.063	5.77	0.048	0.15	0.24	0.037
	1.7	0.019	2.7	0.022	0.070	0.11	0.017
Dietary burden and residue estimate	1.7	0.019	2.7	0.022	0.070	0.11	0.017

^a Highest residues for tissues and mean residue for milk

^b Mean residues for tissues and milk

For beef and dairy cattle, the Meeting estimated HR values for acetamiprid (total residue) of 0.30 mg/kg in muscle, 0.89 mg/kg in edible offal (based on kidney) and 0.16 mg/kg in fat. STMR values were estimated at levels of 0.019 mg/kg for milk, 0.022 mg/kg for muscle, 0.11 mg/kg in edible offal (based on kidney) and 0.017 mg/kg for fat.

The Meeting also estimated the following maximum residue levels to replace its previous recommendations: 0.2 mg/kg for milk, 0.5 mg/kg for meat (from mammals other than marine mammals), 0.3 mg/kg for mammalian fats (except milk fats) and 1.0 mg/kg for edible offal (mammalian).

The previous recommendations for poultry tissues and eggs are maintained.

RECOMMENDATIONS

On the basis of the data from supervised trials the Meeting concluded that the residue levels listed in Annex I are appropriate for establishing maximum residue limits and for IEDI and IESTI assessment.

Definition of the residue for plant commodities (for compliance with MRL and estimation of dietary intake): *acetamiprid*.

Definition of the residue for animal commodities (for compliance with MRL and estimation of dietary intake): *sum of acetamiprid and desmethyl-acetamiprid, expressed as acetamiprid*.

The residue is not fat-soluble.

CCN	Commodity	Recommended Maximum residue level (mg/kg)		STMR or STMR-P mg/kg	HR or HR-P mg/kg
		New	Previous		
VS 0621	Asparagus	0.8		0.26	0.43
VC 0424	Cucumber	0.3		0.057	0.17
MO 0105	Edible offal (mammalian)	1	0.05	0.11	0.89
VC 0045	Fruiting vegetables, Cucurbits	W	0.2		
VC 0045	Fruiting vegetables, Cucurbits (except Cucumber)	0.2		0.05	0.11
MF 0100	Mammalian fats (except milk fats)	0.3	0.02	0.017	0.16
MM 0095	Meat (from mammals other than marine mammals)	0.5	0.02	0.022 (m) 0.017 (f)	0.30 (m) 0.16 (f)
ML 0106	Milks	0.2	0.02	0.019	
VL 0485	Mustard greens	15 ^a		2.0	10
VO 0447	Sweet corn (corn-on-the-cob)	0.01*		0.01	0.01

CCN	Commodity	Recommended Maximum residue level (mg/kg)		STMR or STMR-P mg/kg	HR or HR-P mg/kg
		New	Previous		
	Sweet corn, stover	40		2.8	20
	Sweet corn forage			1.4	9.1

^a On the basis of information provided to the JMPR it was not possible to conclude that the estimated short-term intake of acetamiprid for consumption of mustard greens was less than the ARfD

DIETARY RISK ASSESSMENT

Long-term intake

The WHO panel of the 2011 JMPR established an ADI of 0–0.07 mg/kg bw for acetamiprid. The International Estimated Daily Intakes (IEDIs) for acetamiprid were calculated for the 17 GEMS/Food cluster diets using STMRs and STMR-Ps estimated by the current and previous Meeting. The results are shown in Annex 3 in the 2015 JMPR Report.

The calculated IEDIs represented 0–4% of the maximum ADI. The Meeting concluded that the long-term intake of residues of acetamiprid from used that have been considered by the JMPR is unlikely to present a public health concern.

Short-term intake

The WHO panel of the 2011 JMPR established an ARfD of 0.1 mg/kg. The International Estimated Short Term Intakes (IESTIs) for acetamiprid was calculated for the food commodities using HR/STMR estimated by the current Meeting. The results are shown in Annex 4 in the 2015 JMPR Report.

For mustard greens, the IESTI represented 490% and 200% of the ARfD for children and general population, respectively. No alternative GAP was available. On the basis of information provided to the JMPR, the meeting concluded that the short-term intake of acetamiprid from consumption of mustard greens may present a public health concern.

Estimates of intake for the other commodities considered by the 2015 JMPR were within 0–10% ARfD. The Meeting concluded that the short-term intake of acetamiprid for these other commodities is unlikely to present a public health concern when acetamiprid is used in ways that were considered by the Meeting.

REFERENCES

Code	Author	Year	Title, Institute, Report reference
AC-01	Li, Yiqiang	2012	Method Performance Verification for the Determination of Residues of Acetamiprid in Cucumber by LC-MS/MS. Institute for Control of Agrochemicals, Ministry of Agriculture, P.R. China
AC-02	Li, Yiqiang	2013	Cucumber: Stability during deep freeze storage up to 10 months Acetamiprid Active substance. Institute for Control of Agrochemicals, Ministry of Agriculture, P.R. China
AT-01	Li, Zhou	2012	Method Performance Verification for the Determination of Residues of Acetamiprid in Tomato by LC-MS/MS. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
AT-02	Li, Zhou	2013	Tomato: Stability during deep freeze storage up to 10 months. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
AT-03	Li, Zhou	2013	Determination of the residues of acetamiprid in tomato after spraying of 30 g ai/L Acetamiprid ME in the open field in Shandong. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
AT-04	Li, Zhou	2013	Determination of the residues of acetamiprid in tomato after spraying of 30 g ai/L 7Acetamiprid ME in the open field in Fujian.

Code	Author	Year	Title, Institute, Report reference
AT-05	Li, Zhou	2013	Determination of the residues of acetamiprid in tomato after spraying of 30 g ai/L Acetamiprid ME in the open field in Jilin. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
AT-06	Li, Zhou	2013	Determination of the residues of acetamiprid in tomato after spraying of 30 g ai/L Acetamiprid ME in the open field in Yunnan. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
AT-07	Li, Zhou	2013	Determination of the residues of acetamiprid in tomato after spraying of 30 g ai/L Acetamiprid ME in the open field in Guangdong. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
AT-08	Li, Zhou	2013	Determination of the residues of acetamiprid in tomato after spraying of 30 g ai/L Acetamiprid ME in the open field in Zhejiang. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
AT-09	Li, Zhou	2013	Determination of the residues of acetamiprid in tomato after spraying of 30 g ai/L Acetamiprid ME in the open field in Hunan. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
AT-10	Li, Zhou	2013	Determination of the residues of acetamiprid in tomato after spraying of 30 g ai/L Acetamiprid ME in the open field in Anhui. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
AT-11	Li, Zhou	2013	Determination of the residues of acetamiprid in tomato after spraying of 30 g ai/L Acetamiprid ME in the greenhouse in Shandong. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
AT-12	Li, Zhou	2013	Determination of the residues of acetamiprid in tomato after spraying of 30g ai/L Acetamiprid ME in the greenhouse in Fujian. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
AT-13	Li, Zhou	2013	Determination of the residues of acetamiprid in tomato after spraying of 30g ai/L Acetamiprid ME in the greenhouse in Jilin. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
AT-14	Li, Zhou	2013	Determination of the residues of acetamiprid in cherry tomato after spraying of 30 g ai/L Acetamiprid ME in the greenhouse in Shandong. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
AT-15	Li, Zhou	2013	Determination of the residues of acetamiprid in cherry tomato after spraying of 30 g ai/L Acetamiprid ME in the greenhouse in Fujian. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
AT-16	Li, Zhou	2013	Determination of the residues of acetamiprid in cherry tomato after spraying of 30 g ai/L Acetamiprid ME in the greenhouse in Jilin. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
AAFC06-034R	Lonsbary, S	2011	Acetamiprid: Magnitude of the Residue on Sweet Corn. Minor Use Pesticide Program, Agriculture and Agri-Food Canada, Ottawa, GLP, not published
IR-4 PR No. 09939	Samoil, K	2010	Acetamiprid: Magnitude of the Residue on Asparagus. IR-4 Project HQ, Rutgers, The State University of New Jersey, Princeton, NJ 08540, GLP, not published
IR-4 PR No. 09271	Samoil, K	2011	Acetamiprid: Magnitude of the Residue on Mustard Greens. IR-4 Project HQ, Rutgers, The State University of New Jersey, Princeton, NJ 08540, GLP, not published
IR-4 PR No. 10216	Samoil, K	2011	Acetamiprid: Magnitude of the Residue on Sweet corn. IR-4 Project HQ, Rutgers, The State University of New Jersey, Princeton, NJ 08540, GLP, not published
R-AC-03/05	Wang, Xiuguo	2013	Determination of the residues of acetamiprid on cucumber after spraying of 20% acetamiprid SP in open field in Shandong Province, P.R. China. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
R-AC-04	Wang, Xiuguo	2013	Determination of the residues of acetamiprid on fruit cucumber after spraying of 20% acetamiprid SP in greenhouse in Shandong Province, P.R. China. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
R-AC-04	Wang, Xiuguo	2013	Determination of the residues of acetamiprid on cucumber after spraying of 20% acetamiprid SP in greenhouse in Shandong Province, P.R. China. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China

Code	Author	Year	Title, Institute, Report reference
R-AC -06/08	Wang, Xiuguo	2013	Determination of the residues of acetamiprid on cucumber after spraying of 20% acetamiprid SP in Open Field in Fujian Province, P.R. China. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
R-AC -07	Wang, Xiuguo	2013	Determination of the residues of acetamiprid on fruit cucumber after spraying of 20% acetamiprid SP in greenhouse in Fujian Province, P.R. China. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
R-AC -07	Wang, Xiuguo	2013	Determination of the residues of acetamiprid on cucumber after spraying of 20% acetamiprid SP in greenhouse in Fujian Province, P.R. China. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
R-AC-09	Wang, Xiuguo	2013	Determination of the residues of acetamiprid on cucumber after spraying of 20% acetamiprid SP in open field in Jilin Province, P.R. China. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
R-AC -10	Wang, Xiuguo	2013	Determination of the residues of acetamiprid on cucumber after spraying of 20% acetamiprid SP in Greenhouse in Jilin Province, P.R. China. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
R-AC -11	Wang, Xiuguo	2013	Determination of the residues of acetamiprid on fruit cucumber after spraying of 20% acetamiprid SP in greenhouse in Jilin Province, P.R. China. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
R-AC -12	Wang, Xiuguo	2013	Determination of the residues of acetamiprid on cucumber after spraying of 20% acetamiprid SP in open field in Hunan, P.R. China. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
R-AC -13	Wang, Xiuguo	2013	Determination of the residues of acetamiprid on cucumber after spraying of 20% acetamiprid SP in open field in Zhejiang Province, P.R. China. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
R-AC -14	Wang, Xiuguo	2013	Determination of the residues of acetamiprid on cucumber after spraying of 20% acetamiprid SP in open field in Yunnan, P.R. China. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
R-AC -15	Wang, Xiuguo	2013	Determination of the residues of acetamiprid on cucumber after spraying of 20% acetamiprid SP in open field in Guangdong Province, P.R. China. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China
R-AC-16	Wang, Xiuguo	2013	Determination of the residues of acetamiprid on cucumber after spraying of 20% acetamiprid SP in open field in Anhui Province, P.R. China. Institute for Control of Agrochemicals, Ministry of Agriculture, P. R. China