TRIFLOXYSTROBIN (213)

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EXPLANATION

Trifloxystrobin is a broad-spectrum contact fungicide for foliar application. It was first evaluated by the JMPR in 2004 (T, R) and 2012 (R). The 2004 Meeting established an ADI of 0–0.04 mg/kg bw and decided that ARfD was not necessary. The Meeting agreed that the residue definition for enforcement purposes for plant commodities should be trifloxystrobin per se, for animal commodities and dietary intake assessment the residue definition should be parent compound and CGA 321113 (expressed as trifloxystrobin equivalents).

Data on identity, formulations, physical and chemical properties, metabolism and environmental fate of trifloxystrobin were submitted to the JMPR in 2004. No new information was made available. Supervised trials data were submitted for a number of commodities for evaluation by the 2004, and 2012 JMPR.

Trifloxystrobin was listed by the 46th Session of CCPR (2014) for the evaluation by the 2015 JMPR for additional MRLs. Additional supervised trial data were submitted for evaluation on dry soya beans, lentils, chick peas and peas together with new data, which were not available in the first evaluation in 2004.

METHODS OF RESIDUE ANALYSIS

Analytical methods

The Meeting received descriptions and validation data for analytical methods for residues of trifloxystrobin (CGA 321113) and several other metabolites in different plant matrices.

The DFG method S19, evaluated in 2004, is suitable for enforcement. Analytical methods used in residue trials evaluated by the present Meeting are summarized below.

Method 00742 (Nuesslein, F 2002)

The method was developed and validated for the determination of residues of parent trifloxystrobin and CGA 321113 (metabolite) in/on sample materials of carrots, Brussels sprouts, cabbages, tomatoes, red peppers and lettuce. Both analytes were extracted from plant materials using a mixture of acetonitrile/water. After filtration and concentration to the aqueous remainder, the acidified crude extract was purified by liquid-liquid partition on a ChemElut cartridge, thereby partitioning the analytes in a mixture of cyclohexane / ethyl acetate. The residues were quantified by reverse-phase HPLC with Turbo-Ionspray MS/MS-detection. The limit of quantitation (LOQ) was 0.02 mg/kg in all matrices. Recoveries for trifloxystrobin ranged from 72 to 99% with mean values between 81 and 93% and relative standard deviations between 0.7 and 10.4%. In the case of CGA 321113, recoveries were between 71 and 103% with mean values between 83 and 100% and relative standard deviations between 0.6 and 8.1%. The repeatability was tested with carrots and tomatoes.

Supplement E001 for method 00742 (Nuesslein, F 2003)

The analytical method 00742 was validated for the determination of trifloxystrobin and CGA 321113 in additional plant materials. Recovery tests were performed at fortification levels of 0.02 mg/kg, 0.20 mg/kg and 2.0 mg/kg with the sample materials beans (beans with pods), broccoli (head), cauliflower (head), cherries (fruit), cucumbers (fruit), currants (fruit), leeks (shoots), melons (fruit, peel), plums (fruit) and strawberries (fruit, jam and preserves). The LOQ was 0.02 mg/kg in all matrices. Individual recovery rates of trifloxystrobin ranged from 68 to 103% with overall standard deviations (RSD) between 1.1 and 9.3%. In the case of CGA 321113, recoveries were between 81 and

101% with overall standard deviations (RSD) between 1.4 and 5.4%. The repeatability was tested successfully with cauliflower and strawberries.

Method 00765 (Sur, R 2003.)

The method was developed and validated to determine trifloxystrobin, its metabolite CGA 321113, and cyproconazole in/on cucumbers, green peppers, melons and tomatoes. The active substances and the metabolite were extracted twice from the sample material with an acetonitrile/water mixture. After filtration and dilution the extract solution was subjected to HPLC-MS/MS analysis for quantitation. For all three analytes two transitions are recorded. The LOQ for all analytes was 0.01 mg/kg. The method was validated by spiking control samples with the analytes at fortification levels of 0.01 and 0.1 mg/kg. The overall mean recovery for the quantifier transition was 99% (RSD 3.8%, n=32) for trifloxystrobin and 100% (RSD 2.7%, n=32) for CGA 321113. For the qualifier transition the overall mean recovery was 100% (RSD 4%, n=32) for trifloxystrobin and 96% (RSD 6.2%, n = 32) for CGA 321113. The repeatability was tested with melons and tomatoes.

Method 01013 (Brumhard, B and Stuke, S 2007.)

The method was developed for the determination of residues of trifloxystrobin and metabolite CGA 321113, and other actives substances and their metabolites in/on plant material (citrus fruit, pea green seed, wheat grain, rape seed, and corn green material). All analytes were extracted from plant materials using a mixture of acetonitrile/water. After filtration of the extract, the stable isotopically labelled analytes were added. The solution was made up to volume, diluted and subjected to reversed phase HPLC-MS/MS without a further clean-up step.

The LOQ for the determination of trifloxystrobin and CGA 321113 was 0.01 mg/kg in all matrices tested. The method was validated by spiking control samples with the analytes at fortification levels of 0.01 and 0.1 mg/kg. Mean recoveries for each fortification level and the overall mean recovery were within the 70–110% range for all matrices. The correlation between the injected amount of substance and the detector response was linear for solvent standards ranging from 0.005 to 50 µg/L. Possible matrix effects were eliminated by the internal standard procedure using isotopically stable labelled standards.

Apparent residues in control samples were below 0.3 × LOQ. Two MRM transitions were monitored and calculated for each analyte and each matrix tested. The HPLC-MS/MS method is highly specific and an additional confirmatory method is not necessary. The repeatability was tested successfully with all matrices. Relative standard deviations were below 20% for all analytes and sample materials. The method 01013 allows determination of trifloxystrobin-derived residues in crops with a LOQ of 0.01 mg/kg.

Method 01313 (Stuke, S 2013.)

The method was developed for the determination of residues of trifloxystrobin (CGA 279202) and metabolite CGA 321113, and their isomers CGA357262, CGA357261, CGA331409, and CGA373466 in/on corn green material, bean dry seed, wheat grain, rape seed, dried hops and orange fruit. All analytes were extracted from plant materials using a mixture of acetonitrile/water. After filtration by using celite and addition of ammonium acetate solution to adjust the pH, the extract was made up to volume, diluted and subjected to HPLC-MS/MS measurement. The LOQ for the determination of trifloxystrobin and CGA 321113 was 0.01 mg/kg in all matrices tested. The method was validated by spiking control samples with the analytes at fortification levels of 0.01 and 0.1 mg/kg (0.05 and 0.5 mg/kg in hops). Mean recoveries for each fortification level and the overall mean recovery were within the 70–110% range for trifloxystrobin and CGA 321113. The mean and the overall mean relative standard deviations at each fortification level were below 20%.

The results of the method validation were confirmed using a second and a third MRM transition for confirmation. The LOQ was 0.01 mg/kg for trifloxystrobin-derived residues.

Method 200177 (de Haan, RA 2002.)

The method was developed for the determination of trifloxystrobin and CGA 321113 in plant materials. The residues of trifloxystrobin and CGA 321113 were extracted from homogenised plant samples with acetonitrile/water (4 vol. + 1 vol.) in a blender. The suspension was vacuum filtered through a paper filter. The remaining solids were blended a second time with fresh solvent and filtered. The filtrates were combined and deuterated internal standard was added. The total volume was adjusted to 50 mL with acetonitrile/water (4 vol. + 1 vol.). A solid phase extraction was performed on a SPE column under slight vacuum. The column was rinsed with acetonitrile/water (4 vol. + 1 vol.) and the analytes were eluted with acetonitrile. The solution was evaporated to dryness, the dry residue was subsequently dissolved in acetonitrile/water (4 vol. + 1 vol.). The final determination was done with LC/MS/MS in the positive ion mode. The LOQ was 0.01 mg/kg.

The recovery values obtained during the validation of the above methods are summarized in Table 1.

Table 1 Recovery of trifloxystrobin and CGA321113 from different plant materials

Sample /method	Analyte	Spike level [mg/kg)	No of tests	Mean recovery [%]	RSD [%]
Method 00742 trifloxystrobin 409.2 →186.3 (145.2) amu; CGA 321113: 395.1→186.1 (145.2).					
Carrot	Trifloxystrobin	0.02, 0.2	10	85	5.9
	CGA321113		10	83	5.6
Brussels sprout	Trifloxystrobin	0.02, 0.2, 2.0	9	86	5.2
	CGA321113			90	5.6
Cabbage, head	Trifloxystrobin	0.02, 0.2, 2.0	9	84	5.3
	CGA321113		9	91	2.5
Lettuce, head	Trifloxystrobin	0.02, 0.2, 2.0	9	88	7.5
	CGA321113		9	95	3.0
Pepper	Trifloxystrobin	0.02, 0.2, 2.0	9	90	4.5
	CGA321113		9	96	3.3
Tomato	Trifloxystrobin	0.02, 0.2	10	89	9.5
	CGA321113		10	96	5.2
Method 00742/Supplement E001					
Bean	Trifloxystrobin	0.02, 0.2, 2.0	9	91	5.3
	CGA321113			91	5.1
Broccoli, head	Trifloxystrobin	0.02, 0.2, 2.0	9	93	3.6
	CGA321113			96	4.1
Cauliflower	Trifloxystrobin	0.02, 0.2	10	92	3.6
	CGA321113			93	4.1
Cherry, fruit	Trifloxystrobin	0.02, 0.2, 2.0	9	95	2.7
	CGA321113			94	2.9
Cucumber	Trifloxystrobin	0.02, 0.2, 2.0	9	94	3.5
	CGA321113			90	4.7
Currant	Trifloxystrobin	0.02, 0.2, 2.0	9	92	4.0
	CGA321113			95	4.3
Leek	Trifloxystrobin	0.02, 0.2, 2.0	9	93	1.9
	CGA321113			94	1.8
Melon, fruit	Trifloxystrobin	0.02, 0.2, 2.0	9	94	2.3
	CGA321113			94	2.6
Melon, peel	Trifloxystrobin	0.02, 0.2, 2.0	9	93	1.1
	CGA321113			94	1.4
Plum, fruit	Trifloxystrobin	0.02, 0.2, 2.0	9	94	1.3
	CGA321113			96	1.4
Strawberry, fruit	Trifloxystrobin	0.02, 0.2	10	86	9.3
	CGA321113			89	3.8
Strawberry, jam	Trifloxystrobin	0.02, 0.2, 2.0	9	94	5.3
	CGA321113			95	4.7
Strawberry, preserve	Trifloxystrobin	0.02, 0.2, 2.0	9	95	5.4
	CGA321113			95	5.4
Method 00765 trifloxystrobin 409.2 →186.3 (145.2) amu; CGA 321113: 395.1→186.1 (145.2).					
Cucumber	Trifloxystrobin	0.01, 0.1	6	94	2.9

Sample /method	Analyte	Spike level [mg/kg)	No of tests	Mean recovery [%]	RSD [%]
	CGA321113			99	3.0
Green pepper	Trifloxystrobin	0.01, 0.1	6	101	3.4
	CGA321113			102	3.3
Melon	Trifloxystrobin	0.01, 0.1	10	97	1.9
	CGA321113			98	107
Tomato	Trifloxystrobin	0.01, 0.1	10	101	1.9
	CGA321113			100	1.9
Method 01013 trifloxystrobin 409.2 →186.3 (145.2) amu; CGA 321113: 395.1→186.1 (145.2).					
Citrus fruit	Trifloxystrobin	0.01, 0.1	10	99	3.7
	CGA321113			102	8.8
Peas	Trifloxystrobin	0.01, 0.1	10	100	3.1
	CGA321113			101	4.7
Rape seed	Trifloxystrobin	0.01, 0.1	10	99	3.6
	CGA321113			103	5.6
Wheat grain	Trifloxystrobin	0.01, 0.1	10	98	3.1
	CGA321113			88	13.2
Corn green material	Trifloxystrobin	0.01, 0.1	10	104	5.6
	CGA321113			94	12.8
Method 200177 trifloxystrobin 409.2 →186.3 (145.2) amu; CGA 321113: 395.1→186.1 (145.2). TFS-d_3 412 →186; CGA 321113-d_3 398 →186					
Pepper, tomato	Trifloxystrobin	0.01	16	93	11.2
	CGA321113			91	13.6
Soya beans	Trifloxystrobin	0.01, 0.05, 0.2		86	6.4
	CGA321113			91	19

Stability of residues in stored analytical samples

Individual data on storage stability were evaluated by the 2004 JMPR. The results indicated that the residues of trifloxystrobin and CGA 321113 are stable under freezer storage conditions for at least 24 months (grapes, cucumbers, potato, and wheat grain, straw and whole plant) or 18 months (apple fruit, apple wet pomace, peanut nutmeat, peanut oil, and grape juice). No new information was provided.

USE PATTERNS

Various formulations of trifloxystrobin are registered for application in chickpeas, dry peas, lentils and soya (Table 2) for the control of various fungus diseases of Chickpea (Ch), dry peas (Dp), Lentils (L) and soya (S): *Alternaria* spp. (S), *Ascochyta lentis* (L), *Ascochyta pisi* (Dp), *Ascochyta rabiei* (Ch), *Botrytis cinerea* (CH, L), *Cercospora kikuchii* (S), *Cercospora sojina* (S), *Colletotrichum truncatum* (Ch,L,S), *Corynespora cassiicola* (S), *Diaporthe phaseolorum* (S), *Erysiphe diffusa* (S), *Macrophomina phaseolina* (S), *Microsphaera diffusa* (S), *Mycosphaerella pinodes* (Dp), *Phakopsora pachyrhizi* (S), *Phomopsis longicolla* (S), *Rhizoctonia solani* (S), *Sclerotinia sclerotiorum* (Ch, L, S), and *Septoria glycines* (S).

Table 2 Composition of trifloxystrobin formulations

Formulation	Active ingredient content
SC 500	375 g/L trifloxystrobin + 125 g/L prothionazole
SC 535	375 g/L trifloxystrobin + 160 g/L cyproconazole
EC 267.5	187.5 g/L trifloxystrobin + 80 g/L cyproconazole
SC 325	150 g/L trifloxystrobin + 175 g/L prothionazole
EC 250	125 g/L trifloxystrobin + 125 g/L propiconazole
SC 300	100 g/L trifloxystrobin + 200 g/L tebuconazole

Table 3 Registered uses for foliar application of trifloxystrobin in peas, lentils and soya beans

Crop	Country	Formulation	Application			PHI
			Rate, [kg ai/ha]		No.	(days)
Chickpea	Canada	SC 325		0.132	1–2	30 (seed) [a]

Crop	Country	Formulation	Application			PHI
			Rate, [kg ai/ha]		No.	(days)
Chickpea	USA	SC 325		0.12	1–2	30 (seed) [a]
Dry peas	Canada	SC 325		0.132	1–2	30 (seed) [a]
Dry peas	USA	SC 325		0.12	1–2	30 (seed) [a]
Lentils	Canada	SC 325		0.132	1–2	30 (seed) [a]
Lentils	USA	SC 325		0.12	1–2	30 (seed) [a]
Soya bean	Brazil	EC 267.5	0.0563	0.075	2	30
		SC 325	0.045–	0.060	2	30
		SC 300	0.04–	0.06	1–4	30
		SC 535	0.0563–	0.075	2	30
		EC 250		0.05	2	30
Soya bean	Canada	EC 250		0.0625	max. 2	20 [b]
		SC 325		0.0858	max. 2	20 [b]
Soya bean	USA	EC 250		0.0913	max. 3	21 [b]
Soya bean	USA	SC 500	0.1095	0.1271	max. 3	21 [b]

[a] Do not apply within 7 days of cutting or swathing of the crop for forage

[b] Do not graze or feed soya bean forage or hay

RESIDUES RESULTING FROM SUPERVISED TRIALS ON CROPS

Numerous residue trials were performed according to GLP with different mixture formulations of trifloxystrobin.

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. Control samples are indicated in the summary tables with a "c". Unless stated otherwise, residue data are recorded unadjusted for recovery. The averages of detected residues, used for estimation of residue levels, are double underlined.

Residues have generally been rounded to two significant figures or, for residues near the LOQ, to one significant figure. However, the calculations were made with Excel utilising all digits. Residue values from the trials conducted according to GAP have been used for the estimation of maximum residue levels. Those results included in the evaluation are underlined.

Pulses

Soya beans

Four field trials were conducted in Canada (Ardiel, KD 2007.) with application rates of two times 0.0625 kg trifloxystrobin/ha and sampling 19 or 21 days after the last application.

In 2003 a total of twenty residue trials were performed in the USA. Trifloxystrobin was applied three times at application rates of 0.086 to 0.095 kg trifloxystrobin/ha. Samples of soya bean (seed) were taken at days 19 to 24 after the last application. In 2005 an additional twenty residue trials were conducted in the USA. Trifloxystrobin was applied three times at application rates of 0.122 to 0.134 kg ai/ha. Samples of soya bean (seed) were taken at days 19 to 23 after the last application.

The residues of trifloxystrobin and CGA 321113 were determined according to method 200177. The LOQ was 0.01 mg/kg.

Altogether 16 trials were reported from Brazil according to the Brazilian use patterns with two applications up to 0.075 or four applications up to 0.06 kg trifloxystrobin/ha and a PHI of about 30 days. The LOQ was 0.01–0.02 mg/kg (Anon. 2010, Anon. 2012a, 2012b, Resende, G 2011, Santiago, L 2012a, 2012b, Galhiane, MS and de Sousa, SL 2006a, Galhiane, MS and de

Sousa, SL 2006b, Galhiane, MS and de Sousa, SL 2006c, Galhiane, MS and de Sousa, SL 2006d, Galhiane, MS and de Sousa, SL 2006e, Galhiane, MS and de Sousa, SL 2006f.).

The results of the trials are summarized in Tables 4–6.

Table 4 Results of residue trials conducted with 250 EC trifloxystrobin (TFS) in/on soya bean seed in Canada

Study Trial No. Plot No. Year			Application					Residues [mg/kg] [a]		
	Crop Variety	Country	No	kg/ha (as)	kg/hL (as)	GS	DAT	TFS	CGA	
Canadian GAP: 2 time 0.0625 kg ai/ha with PHI of 30 days.										
06BCS-14 05BCS06-01-05D CND-05BCS06-01-05D, 2005	DeKalb, DKBOO-99	Canada Rock-wood	2	0.0625	0.0179–0.0182	87	9 9 14 14 21 21 24 24 30 30	0.012 < 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 < 0.01 < 0.01	< 0.01
06BCS-14 05BCS06-02-05H CND-05BCS06-02-05H, 2005	Pioneer 90B73	Canada Green-field	2	0.0625	0.0166–0.0182	86	19 19	< 0.01 < 0.01	< 0.01 < 0.01	
06BCS-14 05BCS06-03-05H CND-05BCS06-03-05H, 2005	SeCan Raptor	Canada Breslau	2	0.0625	0.0168–0.0185	85	19 19	< 0.01 < 0.01	< 0.01 < 0.01	
06BCS-14 05BCS06-04-05H CND-05BCS06-04-05H, 2005	Herbic. Inc. 26-02R	Canada St-Pie America, North	2	0.0625	0.0230–0.0231	77	21 21	< 0.01 < 0.01	< 0.01 < 0.01	

FL=Formulation

No=number of applications

GS=growth stage at last application

DAT=days after last treatment

TFS= trfloxystrobin

[a] Residues were measured in dry seeds.

Table 5 Results of residue trials conducted with trifloxystrobin in/on soya bean seed in Brazil

Study Trial No. Plot No. Year	Crop Variety	Country Location	Application					DDAT	Residues [mg/kg] [a]		
			FL	No	kg/ha (as)	kg/hL (as)	GS		TFS	CGA 321113	Sum
Brazil GAP: SC325 max 2×75 g/ha PHI=30 days											
F11-035 F11-035-01 2011	Soya bean TMG 7161 RR	Brazil Paulinia	325 SC	2	0.06000.0650	0.0300-0.0325	75	25 30 35	< 0.01 < 0.01 < 0.01	0.01 < 0.01 < 0.01	< 0.01
F11-035 F11-035-02 2012	Soya bean Monsoy 7808 RR	Brazil Ribeirão Preto	325 SC	2	0.06080.0615	0.0304-0.0308	71	25 30 35	< 0.01 < 0.01 < 0.01	0.02 0.02 0.01	0.03
F11-035 F11-035-03 2012	Soya bean BRS GO 7560	Brazil Uber-lândia	325 SC	2	0.05970.0608	0.0298-0.0304	79	25 30 35	< 0.01 < 0.01 < 0.01	< 0.01 < 0.01 < 0.01	< 0.01
F11-035 F11-035-04 2012	Soya bean ANTA 82	Brazil Trindade	325 SC	2	0.0600	0.0300	75	30	< 0.01	0.01	< 0.01
F11-035 F11-035-05 2011	Soya bean CD206	Brazil Castro	325 SC	2	0.06000.0653	0.0300-0.0327	65	32	< 0.01	0.01	< 0.01
F11-036 F11-036-01 2011	Soya bean TMG 7161 RR	Brazil Paulinia	325 SC	2	0.0766	0.0383	75	25 30 35	< 0.01 < 0.01 < 0.01	< 0.01 0.01 0.01	0.02

Study Trial No. Plot No. Year	Crop Variety	Country Location	Application					DDAT	Residues [mg/kg] [a]		
			FL	No	kg/ha (as)	kg/hL (as)	GS		TFS	CGA 321113	Sum
F11-036 F11-036-02 2012	Soya bean Monsoy 7808 RR	Brazil Ribeirão Preto	325 SC	2	0.07500.0759	0.0375-0.0380	71	25 30 35	< 0.01 < 0.01 < 0.01	0.02 0.02 0.02	0.03
F11-036 F11-036-03 2012	Soya bean M 7908 RR	Brazil Uber-lândia	325 SC	2	0.07140.0774	0.0357-0.0387	75	25 30 35	< 0.01 < 0.01 < 0.01	< 0.01 0.01 0.01	0.02
F11-036 F11-036-04 2012	Soya bean ANTA 82	Brazil Trindade	325 SC	2	0.07500.0762	0.0375-0.0381	75	30	< 0.01	< 0.01	< 0.01
F11-036 F11-036-05 2011	Soya bean CD 206	Brazil Castro	325 SC	2	0.07660.0776	0.0383-0.0388	65	32	< 0.01	0.01	
Brazilian GAP: SC 300: 0.05 kg ai/ha 4 times; 0.06 kg ai/ha 2 times, PHI 30 days											
F09-022 F09-022-02 2010	Soya bean M7908 RR	Uberlan-dia / MG	300 SC	4	0.073-0.080	0.037-0.040	83	25	< 0.01	< 0.01	< 0.01
F09-022 F09-022-03 2010	Soya bean NK 8350	Ponta Grossa / Parana	300 SC	4	0.07250.0849	0.0363-0.0425	60	28	< 0.01 (n.d.)	< 0.01	< 0.01
F09-022 F09-022-04 2010	Soya bean Valiosa	Goiania / GO	300 SC	4	0.075-0.077	0.038-0.039	85	29	< 0.01	< 0.01 (n.d.)	< 0.01
UNESP RA-992/06 FR05BRA001 BRA-FR05BRA001-P1-A, 2005	Soya bean CD 205	EAE-Paulinia/ SP	75 WG	4	0.050	0.025	86	30	< 0.02	< 0.01 (n.d.)	< 0.02
UNESP RA-993/06 FR05BRA001 BRA-FR05BRA001-P2-A,2005	Soya bean CD 201	Brazil Londrina - PR	75 WG	4	0.050	0.025	85	30	< 0.02	< 0.01 (n.d.)	< 0.02
UNESP RA-994/06 FR05BRA001 BRA-FR05BRA001-P3-A,2005	Soya bean Xingu	Brazil Rondono-polis - MT	75 WG	4	0.050	0.025	83	30	< 0.01 (n.d.)	< 0.01 (n.d.)	< 0.01

FL=Formulation

No=number of applications

GS=growth stage at last application

DAT=days after last treatment

TFS: trifloxystrobin

n.d.=residues below limit of detection

[a] Residues were measured in dry seeds,

Table 6. Results of residue trials conducted with trifloxystrobin in/on soya bean in the USA.

Study Trial No. Plot No. Year			Application						Residues [mg/kg] [a]		
	Variety	Country	FL	No	kg/ha (as)	kg/hL (as)	GS	DAT	TFS	CGA 321113	Sum
USA GAP 250EC, 0.09125 kg/ha max 3 times with PHI of 21 days											
RCTFY004 FL079-03H USA-FL079-03H-B, 2003	Hartz Seed H6686RR	USA Tifton, Georgia	250 EC	3	0.092	0.064	86	20 20	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RCTFY004 FL080-03H USA-FL080-03H-B, 2003	NK S73-Z5	USA Molino, Florida	250 EC	3	0.084–0.092	0.043–0.044	79	24 24	< 0.01 < 0.01	< 0.01 < 0.01	< 0,.01
RCTFY004 FL081-03H USA-FL081-03H-B, 2003	Hornbeck 5588RR	USA Proctor, Arkansas	250 EC	3	0.091–0.092	0.063–0.066	91	21 21	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RCTFY004 FL082-03H USA-FL082-03H-B, 2003	Delta King 5661 RR	USA Newport, Arkansas	250 EC	3	0.092–0.093	0.049–0.049	79	20 20	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RCTFY004 FL083-03D USA-FL083-03D-B 2003	S56-D7	USA Leland, Mississippi	250 EC	3	0.087–0.092	0.068–0.078	77	18 18 21 21 26 26 27 27 32 32	0.055 0.020 0.018 0.035 <u>0.265</u> 0.012 < 0.01 0.030 0.019 0.014 0.015	0.022 < 0.01 < 0.01 < 0.01 <u>≤ 0.01</u> < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	0.265
RCTFY004 FL084-03D USA-FL084-03D-B : yes 2003	FS HT322 STS	USA Seymour, Illinois	250 EC	3	0.092–0.093	0.063–0.068	85	18 18 21 21 24 24 27 27 33 33	< 0.01 < 0.01 <u>< 0.01</u> <u>< 0.01</u> < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	< 0.01 < 0.01 <u>< 0.01</u> <u>< 0.01</u> < 0.01 < 0.01 0.017 0.014 < 0.01 < 0.01	
RCTFY004 FL085-03H USA-FL085-03H-B, 2003	NK S26 C9	USA Springfield, Nebraska	250 EC	3	0.092	0.063–0.064		21 21	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RCTFY004 FL086-03H USA-FL086-03H-B, 2003	Patriot Round-up Ready	USA Stilwell, Kansas	250 EC	3	0.087–0.095	0.060–0.066	85	22 22	0.041 0.040 0.041	0.016 0.016 0.016	0.057
RCTFY004 FL087-03H USA-FL087-03H-B, 2003	Becks 323RR	USA Oxford, Indiana	250 EC	3	0.091–0.093	0.048–0.053	79	20 20	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RCTFY004 FL088-03H USA-FL088-03H-B, 2003	92B94	USA Bagley, Iowa	250 EC	3	0.090–0.094	0.040–0.041	77	20 20	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RCTFY004 FL089-03H USA-FL089-03H-B, 2003	BT-402	USA Carlyle, Illinois	250 EC	3	0.090–0.094	0.048–0.061	79	19 19	0.010 < 0.01 0.01	0.013 0.020 0.017	0.027

Study Trial No. Plot No. Year			Application						Residues [mg/kg] [a]		
	Variety	Country	FL	No	kg/ha (as)	kg/hL (as)	GS	DAT	TFS	CGA 321113	Sum
RCTFY004 FL090-03H USA-FL090-03H-B, 2003	GL2301 RR	USA Saginaw, Michigan	250 EC	3	0.092	0.047–0.048	81	20 20	< 0.01 < 0.01 < 0.01	0.013 < 0.01 0.013	0.023
RCTFY004 FL091-03H USA-FL091-03H-B, 2003	Mycogen 44150	USA Gardner, North Dakota	250 EC	3	0.091–0.093	0.031–0.031	79	20 20	< 0.01 < 0.01 < 0.01	0.013 < 0.01 0.013	0.023
RCTFY004 FL092-03H USA-FL092-03H-B, 2003	SC 9373	USA New Holland, Ohio	250 EC	3	0.089–0.093	0.060–0.061	77	19 19	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RCTFY004 FL093-03H USA-FL093-03H-B, 2003	Dekalb 06-51	USA Campbell, Minnesota	250 EC	3	0.091–0.092	0.032–0.033	93	20 20	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RCTFY004 FL094-03H USA-FL094-03H-B, 2003	Pioneer91m50	USA Geneva, Minnesota	250 EC	3	0.091–0.094	0.062–0.063	95	20 20	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RCTFY004 FL095-03H USA-FL095-03H-B, 2003	Dekalb 3151	USA Sheridan, Indiana	250 EC	3	0.091–0.094	0.055–0.061	81	21 21	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RCTFY004 FL096-03H USA-FL096-03H-B, 2003	Rough Rider	USA Northwood North Dakota	250 EC	3	0.091–0.094	0.033–0.033	95	21 21	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RCTFY004 FL097-03H USA-FL097-03H-B, 2003	Pioneer 93B86	USA Richland, Iowa	250 EC	3	0.090–0.092	0.043–0.059	91	19 19	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RCTFY004 FL098-03H USA-FL098-03H-B, 2003	Brunner BR-1500 RR	USA Arkansaw, Wisconsin	250 EC	3	0.095	0.033–0.033	81	20 20	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
US GAP 500 SC: 0.1095–0.1271 max 3 times, PHI 21 days											
RATFY011 TF001-05H USA-TF001-05H-B, 2005	S73-Z5	USA Tifton	500 SC	3	0.128	0.0977–0.100	87	21 21	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RATFY011 TF002-05H USA-TF002-05H-B, 2005	Pioneer 95B96	USA Molino	500 SC	3	0.123–0.129	0.107–0.110	88	19 19	< 0.01 0.029	< 0.01 < 0.01	0.02
RATFY011 TF003-05H USA-TF003-05H-B, 2005	AG4403 RR	USA Proctor	500 SC	3	0.128–0.129	0.0895–0.0902	92	20 20	0.030 0.022 0.026	0.017 0.016 0.0165	0.043
RATFY011 TF004-05H USA-TF004-05H-B, 2005	DPL 5806 RR	USA Cheneyville	500 SC	3	0.128–0.129	0.0848–0.0896	80	21 21	0.011 0.013 0.012	< 0.01 < 0.01 < 0.01	0.012

Study Trial No. Plot No. Year			Application						Residues [mg/kg] [a]		
	Variety	Country	FL	No	kg/ha (as)	kg/hL (as)	GS	DAT	TFS	CGA 321113	Sum
RATFY011 TF005-05D USA-TF005-05D-B, 2005	Soya bean Pioneer 9492 RR	USA Leland	500 SC	3	0.130–0.132	0.0872–0.0898	83	17 17 21 21 23 23 27 27 31 31	< 0.01 < 0.01 0.014 < 0.01 0.014 < 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	0.012
RATFY011 TF006-05D USA-TF006-05D-B, 2005	RG 200 RR	USA Sabin	500 SC	3	0.128–0.133	0.0757–0.0847	70	16 16 21 21 24 24 27 27 31 31	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01 0.014 0.014 < 0.01 < 0.01 < 0.01 < 0.01	< 0.01 < 0.01 < 0.01 0.011 < 0.01 0.010 0.01 < 0.01 0.010 < 0.01 < 0.01	0.021
RATFY011 TF007-05H USA-TF007-05H-B, 2005	Taylor 427 RR	USA Stilwell	500 SC	3	0.128–0.133	0.0908–0.0937	83	20 20	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RATFY011 TF008-05H USA-TF008-05H-B, 2005	Nk 32G5	USA Spring-field	500 SC	3	0.127–0.130	0.104–0.106	79	19 19	0.013 0.015 0.014	0.010 < 0.01 0.01	0.0244
RATFY011 TF009-05H USA-TF009-05H-B, 2005	HS3236	USA Monti-cello	500 SC	3	0.127–0.133	0.0901–0.0943	79	20 20	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RATFY011 TF010-05H USA-TF010-05H-B, 2005	Taylor 427 RR	USA Stilwell	500 SC	3	0.126–0.130	0.0906–0.0935	87	20 20	0.012 < 0.01 0.012	< 0.01 < 0.01 < 0.01	0.012
RATFY011 TF011-05H USA-TF011-05H-B, 2005	Asgrow 2801	USA Earlham	500 SC	3	0.128–0.129	0.104–0.106	79	19 19	< 0.01 0.018 0.014	0.010 < 0.01 0.01	0.0254
RATFY011 TF012-05H USA-TF012-05H-B, 2005	92M70	USA Bagley	500 SC	3	0.128–0.129	0.102–0.105	79	21 21	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RATFY011 TF013-05H USA-TF013-05H-B. 2005	Mycogen 0941731	USA Gardner	500 SC	3	0.130–0.132	0.0788–0.0910	81	21 21	< 0.01 < 0.01 < 0.01	0.011 < 0.01 0.011	0.021
RATFY011 TF014-05H USA-TF014-05H-B, 2005	SC 9374	USA New Holland	500 SC	3	0.128–0.133	0.0883–0.0899	95	19 19	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RATFY011 TF015-05H USA-TF015-05H-B, 2005	Pioneer 92M80	USA York	500 SC	3	0.127–0.129	0.0686–0.0690	77	21 21	0.015 0.017 0.16	0.038 0.043 0.042	0.058
RATFY011 TF016-05H USA-TF016-05H-B, 2005	NK 43-B1	USA Carlyle	500 SC	3	0.127–0.129	0.0696–0.0759	79	20 20	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01

Study Trial No. Plot No. Year			Application						Residues [mg/kg] [a]		
	Variety	Country	FL	No	kg/ha (as)	kg/hL (as)	GS	DAT	TFS	CGA 321113	Sum
RATFY011 TF017-05H USA-TF017-05H-B, 2005	Asgrow AG1603	USA Arkansaw	500 SC	3	0.129–0.130	0.0733–0.0734	79	21 21	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RATFY011 TF018-05H USA-TF018-05H-B, 2005	Dairyland 3410	USA Sheridan	500 SC	3	0.126–0.127	0.0608–0.0692	97	21 21	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RATFY011 TF019-05H USA-TF019-05H-B, 2005	Soya bean Asgrow 3802	USA Kiowa	500 SC	3	0.129–0.131	0.0872–0.108	95	23 23	0.015 < 0.01 0.012	< 0.01 < 0.01 < 0.01	< 0.012
RATFY011 TF020-05H USA-TF020-05H-B, 2005	Soya bean Pioneer 93B85	USA St. John	500 SC	3	0.126–0.132	0.0751–0.0781	79	19 19	0.030 0.011 0.02	0.018 0.017 0.018	0.039

FL=Formulation

No=number of applications

GS=growth stage at last application

DAT=days after last treatment

TFS=Trifloxystrobin

[a] Residues were measured in dry seeds

Beans and Peas (dry)Green beans

Nine field trials were conducted in Canada in 2012 with trifloxystrobin in/on dry beans (Milo, J and Harbin, A 2013a.) Two applications at 0.129 to 0.137 kg ai/ha were done with a spray interval of 10 to 14 days and a pre-harvest interval of 28 to 32 days.

Nine field trials were conducted in Canada in 2012 with trifloxystrobin in/on peas (Milo, J and Harbin, A 2013b.). Two applications at 0.108 to 0.135 kg ai/ha were done with a spray interval of 11 to 14 days and a pre-harvest interval of 29 to 31 days.

The residues of trifloxystrobin and CGA 321113 were quantified according to methods 00742, 00742/M001 and 01313 at a LOQ of 0.01 mg/kg.

The results are summarized in Tables 7 and 8.

Table 7 Results of residue trials conducted with 325 SC trifloxystrobin in/on kidney beans in Canada

Study Trial No. Plot No. Year			Application					Residues [mg/kg] [a]		
	Crop Variety	Country	No	kg/ha (as)	kg/hL (as)	GS	DAT	TFS	CGA 321113	SUM
Canadian GAP SC325> 0.132 kg ai/ha 1–2 times, PHI 30 days										
RAJAN003 RAJAN003-01-12H, 2012	Zorro Black Bean	Canada Arthur	2	0.13430.1375	0.0959–0.0982	77	29 29	< 0.01 < 0.01 < 0.01	0.011 0.011 0.011	< 0.021
RAJAN003 RAJAN003-02-12H, 2012	Red Hawk (red Kidney)	Canada Rock-wood	2	0.13570.1362	0.0969–0.0973	73	32 32	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RAJAN003 RAJAN003-03-12H, 2012	Zorro Black Bean	Canada Breslau	2	0.1292	0.0923	75	29 29	< 0.01 < 0.01 < 0.01	0.010 0.012 0.011	0.021

Study Trial No. Plot No. Year			Application					Residues [mg/kg] [a]		
	Crop Variety	Country	No	kg/ha (as)	kg/hL (as)	GS	DAT	TFS	CGA 321113	SUM
RAJAN003 RAJAN003-04-12H, 2012	Pinto	Canada Whitecap	2	0.13060.1319	0.0933– 0.0942	66	28 28	< 0.01 < 0.01 < 0.01	0.012 0.013 0.012	0.023
RAJAN003 RAJAN003-05-12H, 2012	Pintos	Canada Outlook	2	0.13060.1315	0.0933– 0.0939	65	28 28	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RAJAN003 RAJAN003-06-12H, 2012	Pinto	Canada Kenaston	2	0.13040.1343	0.0931– 0.0959	66	28 28	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RAJAN003 RAJAN003-07-12H, 2012	Viva Pink	Canada Taber	2	0.12940.135	0.0924– 0.0964	75	32 32	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RAJAN003 RAJAN003-07-12H, 2012	Viva Pink	Canada Taber	2	0.12940.135	0.0924– 0.0964	75	32 32	< 0.01 < 0.01	< 0.01 < 0.01	
RAJAN003 RAJAN003-08-12D, 2012	Pinto	Canada Rosthern	2	0.12940.1314	0.0924– 0.0939	71	21 21 25 25 29 29 36 36 40 40	0.011 0.018 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01	0.015 0.017 0.014 0.013 0.012 0.011 0.012 0.012 < 0.01 0.011 0.011	0.022
RAJAN003 RAJAN003-09-12H, 2012	Bean, Kidney Pintos	Canada Alvena	2	0.1315- 0.1327	0.0939– 0.0948	71	31 31	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01

FL=Formulation

No=number of applications

GS=growth stage at last application

DAT=days after last treatment

TFS=trifloxystrobin

[a] Residues were measured in dry seeds,

Table 8 Results of residue trials conducted with 325 SC trifloxystrobin in/on pea in 2012

Study Trial No. Plot No.			Application					Residues [mg/kg] [a]		
	Crop Variety	Country	No	kg/ha (as)	kg/hL (as)	GS	DAT	TFS	CGA 321113	Sum
Canadian GAP: SC325, 0.132 kg ai/ha 1–2 times with PHI of 30 (seed)										
RAJAN004 RAJAN004-01-12H	Pea, field Meadow	Canada Whitecap	2	0.1301– 0.1305	0.0929– 0.0932	72	31 31	< 0.01 < 0.01 < 0.01	0.021 0.023 0.022	0.033
RAJAN004 RAJAN004-02-12H	Pea, field Meadow	Canada Outlook	2	0.1312– 0.1314	0.0937– 0.0939	71	31 31	< 0.01 < 0.01 < 0.01	0.011 0.014 0.012	0.023
RAJAN004 RAJAN004-03-12H	Pea, field Admiral	USA Carring-ton	2	0.1308– 0.1357	0.0934– 0.0969	73	30 30	< 0.01 < 0.01	0.016 0.016	0.027
RAJAN004 RAJAN004-04-12H	Pea, field Meadow	Canada Kenaston	2	0.1303– 0.1311	0.0931– 0.0936	73	29 29	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
RAJAN004 RAJAN004-05-12H	Pea, field Meadow	Canada Waldheim	2	0.1326– 0.133	0.0947– 0.0950	71	29 29	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01

Study Trial No. Plot No.			Application					Residues [mg/kg] [a]		
	Crop Variety	Country	No	kg/ha (as)	kg/hL (as)	GS	DAT	TFS	CGA 321113	Sum
RAJAN004 RAJAN004-06-12H	Pea, field Meadow	Canada Alvena	2	0.1329	0.0949	72	29 29	< 0.01 < 0.01	0.011 0.011	0.021
RAJAN004 RAJAN004-07-12H	Pea, field Meadow	Canada Wakaw	2	0.1309–0.1339	0.0935–0.0956	71	29 29	< 0.01 < 0.01	0.011 0.013	0.022
RAJAN004 RAJAN004-08-12H	Pea, field Thunder-bird	Canada Joseph-burg	2	0.1266–0.1341	0.0904–0.0958	75	30 30	< 0.01 < 0.01	0.010 0.011	0.021
RAJAN004 RAJAN004-09-12D	Pea, field Meadow	Canada Rosthern	2	0.108–0.1082	0.0771–0.0773	69	20 20 25 25 31 31 34 34 40 40	0.012 0.012 0.016 0.019 < 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

FL=Formulation; No=number of applications; GS=growth stage at last application; DAT=days after last treatment; TFS: trifloxystrobin; [1]. Residues were measured in dry seeds,

Animal feeds

The conditions of supervised trials are described under the respective commodities. Only the residues in relevant animal commodities are summarized.

Table 9 Residues of trifloxystrobin in/on soya bean forage derived from trials conducted in the USA

Study Trial No. Plot No. Year			Application						Residues [mg/kg] [a]	
	Variety	Country	FL	No	kg/ha (as)	kg/hL (as)	GS	DAT	TFS	CGA 321113
USA GAP 250EC, 0.09125 kg/ha max 3 times with PHI of 21 days Do not graze or feed soya bean forage or hay.										
RCTFY004 FL079-03H USA-FL079-03H-A, 2003	Hartz Seed H6686RR	USA Tifton, Georgia	250 EC	3	0.092	0.052–0.064	67	0	1.53 6.07	0.106 0.395
RCTFY004 FL080-03H USA-FL080-03H-A, 2003	NK S73-Z5	USA Molino, Florida	250 EC	3	0.086–0.094	0.043–0.046	74	0	0.81 1.21	0.075 0.096
RCTFY004 FL081-03H USA-FL081-03H-A, 2003	Horn-beck 5588RR	USA Proctor, Arkansas	250 EC	3	0.092	0.063–0.066	71	0	2.92 4.65	0.137 0.219
RCTFY004 FL082-03H USA-FL082-03H-A, 2003	Delta King 5661 RR	USA Newport, Arkansas	250 EC	3	0.092–0.094	0.049–0.049	75	0	3.12 3.48	0.168 0.176
RCTFY004 FL083-03D USA-FL083-03D-A,2003	S56-D7	USA Leland, Mississi-ppi	250 EC	3	0.091–0.094	0.074–0.076	70	0 0 3 3 5 5 7 7 10 10	3.00 2.90 2.11 0.828 0.590 0.978 1.27 0.685 0.630 0.388	0.226 0.295 0.215 0.158 0.138 0.230 0.154 0.122 0.091 0.081

Study Trial No. Plot No. Year			Application						Residues [mg/kg] [a]	
	Variety	Country	FL	No	kg/ha (as)	kg/hL (as)	GS	DAT	TFS	CGA 321113
RCTFY004 FL084-03D USA-FL084-03D-A, 2003	FS HT322 STS	USA Seymour, Illinois	250 EC	3	0.093	0.061–0.062	72	0 0 3 3 6 6 8 8 10 10	2.80 2.72 1.30 1.25 0.822 0.895 0.752 0.902 0.705 0.728	0.121 0.135 0.186 0.195 0.160 0.166 0.151 0.160 0.131 0.133
RCTFY004 FL085-03H USA-FL085-03H-A, 2003	NK S26 C9	USA Spring-field, Nebraska	250 EC	3	0.092–0.183	0.061–0.129	65	0	2.30 1.58	0.095 0.083
RCTFY004 FL086-03H USA-FL086-03H-A, 2003	Patriot Round-up Ready	USA Stilwell, Kansas	250 EC	3	0.093–0.187	0.063–0.132	79	0	4.45 6.90	0.178 0.225
RCTFY004 FL087-03H USA-FL087-03H-A, 2003	Becks 323RR	USA Oxford, Indiana	250 EC	3	0.094–0.095	0.051–0.059	69	0	3.45 3.55	0.208 0.196
RCTFY004 FL088-03H USA-FL088-03H-A, 2003	92B94	USA Bagley, Iowa	250 EC	3	0.089–0.092	0.036–0.042	67	0	3.50 5.00	0.164 0.240
RCTFY004 FL089-03H USA-FL089-03H-A, 2003	BT-402	USA Carlyle, Illinois	250 EC	3	0.089–0.093	0.060–0.065	69	0	3.18 3.75	0.213 0.222
RCTFY004 FL090-03H USA-FL090-03H-A, 2003	GL2301RR	USA Saginaw, Michigan	250 EC	3	0.091–0.092	0.047–0.048	69	0	1.54 9.87	0.121 0.948
RCTFY004 FL091-03H USA-FL091-03H-A, 2003	Mycogen 44150	USA Gardner, North Dakota	250 EC	3	0.092–0.093	0.030–0.037	81	0	4.85 /0.027 [b] 6.98	0.485 0.508
RCTFY004 FL092-03H USA-FL092-03H-A, 2003	SC 9373	USA New Holland, Ohio	250 EC	3	0.091–0.093	0.062–0.066	69	0	2.48 2.32	0.154 0.140
RCTFY004 FL093-03H USA-FL093-03H-A, 2003	Dekalb 06-51	USA Campbell, Minnesota	250 EC	3	0.091–0.092	0.032–0.033	70	0	2.75 3.15	0.224 0.258
RCTFY004 FL094-03H USA-FL094-03H-A, 2003	Pioneer91m50	USA Geneva, Minnesota	250 EC	3	0.091–0.092	0.058–0.061	69	0	5.28 4.92	0.365 0.338
RCTFY004 FL095-03H USA-FL095-03H-A, 2003	Dekalb 3151	USA Sheridan, Indiana	250 EC	3	0.091–0.092	0.057–0.058	70	0	3.28 2.46	0.244 0.199
RCTFY004 FL096-03H USA-FL096-03H-A, 2003	Rough Rider	USA Northwood, North Dakota	250 EC	3	0.089–0.094	0.032–0.033	69	0	2.70 2.95	0.255 0.270
RCTFY004 FL097-03H USA-FL097-03H-A, 2003	Pioneer 93B86	USA Richland, Iowa	250 EC	3	0.091–0.094	0.050–0.067	67	0	3.18 3.30	0.115 0.117

Study Trial No. Plot No. Year			Application						Residues [mg/kg] [a]	
	Variety	Country	FL	No	kg/ha (as)	kg/hL (as)	GS	DAT	TFS	CGA 321113
RCTFY004 FL098-03H USA-FL098-03H-A, 2003	Brunner BR-1500-RR	USA Arkansaw, Wisconsin	250 EC	3	0.093– 0.096	0.033– 0.033	69	0	3.95 3.38	0.148 0.115
US GAP 500 SC: 0.1095–0.1271 max 3 times, PHI 21 days Do not graze or feed soya bean forage or hay.										
RATFY011 TF001-05H USA-TF001-05H-A, 2005	S73-Z5	USA Tifton	500 SC	3	0.128	0.0762– 0.102	67	0	6.065 6.843	0.228 0.210
RATFY011 TF002-05H USA-TF002-05H-A, 2005	Pioneer 95B96	USA Molino	500 SC	3	0.123– 0.132	0.0971– 0.110	70	0	6.771 6.365	0.186 0.199
RATFY011 TF003-05H USA-TF003-05H-A, 2005	AG4403 RR	USA Proctor	500 SC	3	0.128– 0.129	0.0902– 0.0928	69	0	21.80 23.86	0.262 0.257
RATFY011 TF004-05H USA-TF004-05H-A, 2005	DPL 5806 RR	USA Cheney-ville	500 SC	3	0.122– 0.127	0.0738– 0.0871	69	0	10.22 9.059	0.171 0.150
RATFY011 TF005-05D USA-TF005-05D-A, 2005	Pioneer 9492 RR	USA Leland	500 SC	3	0.130– 0.132	0.107– 0.112	66	0 0 3 3 5 5 7 7 11 11	9.389 10.47 7.858 8.267 5.482 5.094 3.728 3.512 2.783 2.658	0.228 0.257 0.382 0.379 0.335 0.305 0.299 0.297 0.261 0.213
RATFY011 TF006-05D USA-TF006-05D-A, 2005	RG 200 RR	USA Sabin	500 SC	3	0.125– 0.130	0.0771– 0.0839		0 0 3 3 5 5 7 7 10 10	11.53 11.14 2.455 2.393 1.287 1.554 1.288 1.144 1.567 0.676	0.285 0.267 0.296 0.319 0.214 0.246 0.175 0.169 0.263 0.125
RATFY011 TF007-05H USA-TF007-05H-A, 2005	Taylor 427 RR	USA Stilwell	500 SC	3	0.128– 0.132	0.0898– 0.0934	75	0	13.75 17.36	0.243 0.316
RATFY011 TF008-05H USA-TF008-05H-A, 2005	Nk 32G5	USA Spring-field	500 SC	3	0.129	0.102– 0.106	67	0	11.07 9.589	0.274 0.259
RATFY011 TF009-05H USA-TF009-05H-A, 2005	HS3236	USA Monti-cello	500 SC	3	0.124– 0.132	0.0917– 0.0921	70	0	14.49 14.18	0.254 0.230
RATFY011 TF010-05H USA-TF010-05H-A, 2005	Taylor 427 RR	USA Stilwell	500 SC	3	0.128– 0.134	0.0895– 0.0937	77	0	5.984 6.586	0.138 0.147

Study Trial No. Plot No. Year			Application						Residues [mg/kg] [a]	
	Variety	Country	FL	No	kg/ha (as)	kg/hL (as)	GS	DAT	TFS	CGA 321113
RATFY011 TF011-05H USA-TF011-05H-A, 2005	Asgrow 2801	USA Earlham	500 SC	3	0.128–0.130	0.101–0.106	67	0	8.649 8.747	0.343 0.318
RATFY011 TF012-05H USA-TF012-05H-A, 2005	92M70	USA Bagley	500 SC	3	0.124–0.128	0.0992–0.102	66	0	9.009 5.698	0.249 0.182
RATFY011 TF013-05H USA-TF013-05H-A, 2005	Myco-gen 0941731	USA Gardner	500 SC	3	0.131–0.133	0.0887–0.0963	71	0	16.11 17.30	0.307 0.297
RATFY011 TF014–05H USA-TF014-05H-A, 2005	SC 9374	USA New Holland	500 SC	3	0.126–0.131	0.0879–0.0894	70	0	11.41 10.09	0.203 0.199
RATFY011 TF015-05H USA-TF015-05H-A, 2005	Pioneer 92M80	USA York	500 SC	3	0.127–0.129	0.0686–0.0690	67	0	12.73 8.950	0.274 0.257
RATFY011 TF016-05H USA-TF016-05H-A, 2005	NK 43-B1	USA Carlyle	500 SC	3	0.127–0.128	0.0743–0.0934	66	0	13.58 12.19	0.358 0.353
RATFY011 TF017-05H USA-TF017-05H-A, 2005	Asgrow AG1603	USA Arkansaw	500 SC	3	0.129	0.0729–0.0733	69	0	12.46 13.44	0.276 0.277
RATFY011 TF018-05H USA-TF018-05H-A, 2005	Dairy-land 3410	USA Sheridan	500 SC	3	0.124–0.130	0.0667–0.0723	69	0	6.096 5.792	0.129 0.120
RATFY011 TF019-05H USA-TF019-05H-A, 2005	Asgrow 3802	USA Kiowa	500 SC	3	0.127–0.129	0.101–0.106	69	0	15.26 16.67	0.343 0.332
RATFY011 TF020-05H USA-TF020-05H-A, 2005	Pioneer 93B85	USA St. John	500 SC	3	0.126–0.129	0.0736–0.0759	73	0	10.43 10.66	0.369 0.418

FL=Formulation

No=number of applications

GS=growth stage at last application

DAT=days after last treatment

[a] Residues were measured in forage samples

[b] residues in control

TFS=trifloxystrobin;

Table 10 Residues of trifloxystrobin in/on soya bean hay derived from trials conducted in the USA

Study Trial No. Plot No. Year			Application					Residues [a] [mg/kg]	
	Variety	Country	FL	No	kg/ha (as)	kg/hL (as)	GS	TFS	CGA 321113
USA GAP 250EC, 0.09125 kg/ha max 3 times with PHI of 21 days Do not graze or feed soya bean forage or hay.									
RCTFY004 FL079-03H USA-FL079-03H-A,2003	Hartz Seed H6686RR	USA Tifton, Georgia	250 EC	3	0.092	0.052–0.064	67	9.62 8.50	0.908 0.840
RCTFY004 FL080-03H USA-FL080-03H-A, 2003	NK S73-Z5	USA Molino, Florida	250 EC	3	0.086–0.094	0.043–0.046	74	4.00 3.58	0.535 0.518
RCTFY004 FL081-03H USA-FL081-03H-A, 2003	Horn-beck 5588RR	USA Proctor, Arkansas	250 EC	3	0.092	0.063–0.066	71	5.50 5.55	0.602 0.562
RCTFY004 FL082-03H USA-FL082-03H-A, 2003	Delta King 5661 RR	USA Newport, Arkansas	250 EC	3	0.092–0.094	0.049–0.049	75	9.18 2.22	0.540 0.129
RCTFY004 FL083-03D USA-FL083-03D-A, 2003	S56-D7	USA Leland, Mississippi	250 EC	3	0.091–0.094	0.074–0.076	70	6.30 6.55	0.788 0.730
RCTFY004 FL084-03D USA-FL084-03D-A, 2003	FS HT322 STS	USA Seymour, Illinois	250 EC	3	0.093	0.061–0.062	72	10.4 9.82	0.90 0.0.88
RCTFY004 FL085-03H USA-FL085-03H-A, 2003	NK S26 C9	USA Springfield, Nebraska	250 EC	3	0.092–0.183	0.061–0.129	65	6.25 [c] /5.55 [b] 3.80	0.858 /1.04 [b] 0.570
RCTFY004 FL086-03H USA-FL086-03H-A, 2003	Patriot Round-up Ready	USA Stilwell, Kansas	250 EC	3	0.093–0.187	0.063–0.132	79	9.98 10.4	0.902 0.930
RCTFY004 FL087-03H USA-FL087-03H-A, 2003	Becks 323RR	USA Oxford, Indiana	250 EC	3	0.094–0.095	0.051–0.059	69	10.4 12.3	1.20 1.36
RCTFY004 FL088-03H USA-FL088-03H-A, 2003	92B94	USA Bagley, Iowa	250 EC	3	0.089–0.092	0.036–0.042	67	8.38 10.6	1.11 1.25
RCTFY004 FL089-03H USA-FL089-03H-A, 2003	BT-402	USA Carlyle, Illinois	250 EC	3	0.089–0.093	0.060–0.065	69	7.92 10.2	4.12 4.45
RCTFY004 FL090-03H USA-FL090-03H-A, 2003	GL2301RR	USA Saginaw, Michigan	250 EC	3	0.091–0.092	0.047–0.048	69	14.6 12.1	2.00 1.35
RCTFY004 FL091-03H USA-FL091-03H-A, 2003	Myco-gen 44150	USA Gardner, North Dakota	250 EC	3	0.092–0.093	0.030–0.037	81	15.4 13.2	2.52 2.58
RCTFY004 FL092-03H USA-FL092-03H-A, 2003	SC 9373	USA New Holland, Ohio	250 EC	3	0.091–0.093	0.062–0.066	69	4.92 7.05	0.732 1.07

Study Trial No. Plot No. Year			Application					Residues [a] [mg/kg]	
	Variety	Country	FL	No	kg/ha (as)	kg/hL (as)	GS	TFS	CGA 321113
RCTFY004 FL093-03H USA-FL093-03H-A, 2003	Dekalb 06-51	USA Campbell, Minnesota	250 EC	3	0.091–0.092	0.032–0.033	70	8.20 7.40	1.04 1.02
RCTFY004 FL094-03H USA-FL094-03H-A, 2003	Pioneer91m50	USA Geneva, Minnesota	250 EC	3	0.091–0.092	0.058–0.061	69	4.28 5.00	0.690 0.812
RCTFY004 FL095-03H USA-FL095-03H-A, 2003	Dekalb 3151	USA Sheridan, Indiana	250 EC	3	0.091–0.092	0.057–0.058	70	1.66 5.19	0.278 0.638
RCTFY004 FL096-03H USA-FL096-03H-A, 2003	Rough Rider	USA Northwood, North Dakota	250 EC	3	0.089–0.094	0.032–0.033	69	10.1 7.00	1.96 1.46
RCTFY004 FL097-03H USA-FL097-03H-A, 2003	Pioneer 93B86	USA Richland, Iowa	250 EC	3	0.091–0.094	0.050–0.067	67	4.02 5.30	0.362 0.475
RCTFY004 FL098-03H USA-FL098-03H-A, 2003	Brunner BR-1500-RR	USA Arkansaw, Wisconsin	250 EC	3	0.093–0.096	0.033–0.033	69	11.8 9.88	0.638 0.515
US GAP 500 SC: 0.1095–0.1271 max 3 times, PHI 21 days Do not graze or feed soya bean forage or hay.									
RATFY011 TF001-05H USA-TF001-05H-A, 2005	S73-Z5	USA Tifton	500 SC	3	0.128	0.0762–0.102	67	8.374 10.37	0.884 1.191
RATFY011 TF002-05H USA-TF002-05H-A, 2005	Pioneer 95B96	USA Molino	500 SC	3	0.123–0.132	0.0971–0.110	70	19.44 25.34	0.906 1.149
RATFY011 TF003-05H USA-TF003-05H-A, 2005	AG4403 RR	USA Proctor	500 SC	3	0.128–0.129	0.0902–0.0928	69	60.81 70.90	1.089 1.404
RATFY011 TF004-05H USA-TF004-05H-A, 2005	DPL 5806 RR	USA Cheneyville	500 SC	3	0.122–0.127	0.0738–0.0871	69	38.99 30.51	0.793 0.883
RATFY011 TF005-05D USA-TF005-05D-A, 2005	Pioneer 9492 RR	USA Leland	500 SC	3	0.130–0.132	0.107–0.112	66	30.78 /[b] 0.0127 28.24	1.218 1.846 0.827
RATFY011 TF006-05D USA-TF006-05D-A, 2005	RG 200 RR	USA Sabin	500 SC	3	0.125–0.130	0.0771–0.0839	67	31.47 30.13	2.026 1.675
RATFY011 TF007-05H USA-TF007-05H-A, 2005	Taylor 427 RR	USA Stilwell	500 SC	3	0.128–0.132	0.0898–0.0934	75	41.21 /0.0960 [b] 44.00	0.956 /0.0349 [b] 0.732
RATFY011 TF008-05H USA-TF008-05H-A, 2005	Nk 32G5	USA Springfield	500 SC	3	0.129	0.102–0.106	67	39.46 /0.0295 [b] 40.51	1.293 1.559

Study Trial No. Plot No. Year			Application					Residues [a] [mg/kg]	
	Variety	Country	FL	No	kg/ha (as)	kg/hL (as)	GS	TFS	CGA 321113
RATFY011 TF009-05H USA-TF009-05H-A, 2005	HS3236	USA Monti-cello	500 SC	3	0.124–0.132	0.0917–0.0921	70	47.32 /0.0200 [b] 46.71	1.264 1.543
RATFY011 TF010-05H USA-TF010-05H-A, 2005	Taylor 427 RR	USA Stilwell	500 SC	3	0.128–0.134	0.0895–0.0937	77	21.51 /0.0205 [b] 11.16	0.639 0.455
RATFY011 TF011-05H USA-TF011-05H-A, 2005	Asgrow 2801	USA Earlham	500 SC	3	0.128–0.130	0.101–0.106	67	26.98 /0.0187 [b] 33.67	0.955 1.361
RATFY011 TF012-05H USA-TF012-05H-A, 2005	92M70	USA Bagley	500 SC	3	0.124–0.128	0.0992–0.102	66	21.61 /0.0158 [b] 21.46	1.470 1.373
RATFY011 TF013-05H USA-TF013-05H-A, 2005	Myco-gen 0941731	USA Gardner	500 SC	3	0.131–0.133	0.0887–0.0963	71	42.98 45.69	1.518 1.611
RATFY011 TF014-05H USA-TF014-05H-A, 2005	SC 9374	USA New Holland	500 SC	3	0.126–0.131	0.0879–0.0894	70	15.90 18.71	1.465 1.120
RATFY011 TF015-05H USA-TF015-05H-A, 2005	Pioneer 92M80	USA York	500 SC	3	0.127–0.129	0.0686–0.0690	67	22.60 27.57	0.821 1.175
RATFY011 TF016-05H USA-TF016-05H-A, 2005	NK 43-B1	USA Carlyle	500 SC	3	0.127–0.128	0.0743–0.0934	66	40.04 37.37	5.460 5.743
RATFY011 TF017-05H USA-TF017-05H-A, 2005	Asgrow AG1603	USA Arkansaw	500 SC	3	0.129	0.0729–0.0733	69	32.68 /0.0158 [b] 31.00	1.647 1.749
RATFY011 TF018-05H USA-TF018-05H-A, 2005	Dairy-land 3410	USA Sheridan	500 SC	3	0.124–0.130	0.0667–0.0723	69	8.100 8.446	0.337 0.346
RATFY011 TF019-05H USA-TF019-05H-A, 2005	Asgrow 3802	USA Kiowa	500 SC	3	0.127–0.129	0.101–0.106	69	30.74 36.92	1.202 1.372
RATFY011 TF020-05H USA-TF020-05H-A, 2005	Pioneer 93B85	USA St. John	500 SC	3	0.126–0.129	0.0736–0.0759	73	32.58 /0.0113 [b] 34.38	2.032 1.878

FL=Formulation

No=number of applications

GS=growth stage at last application

DAT=days after last treatment

TFS: trifloxystrobin

[a] Samples were taken 0–3 days after last application

[b] Residues in control

Table 11 Residues in green parts of pea derived from trials conducted with 325 SC trifloxystrobin in Canada

Study Trial No. Plot No. Year			Application					Residues [a] [mg/kg]		
	Crop Variety	Country	No	kg/ha (as)	kg/hL (as)	GS	DAT	TFS	CGA 321113	Sum
RAJAN004 RAJAN004-01- 12H, 2012	Pea, field Meadow	Canada Whitecap	2	0.1301– 0.1305	0.0929– 0.0932	72	6 6	0.81 1.0 0.90	0.039 0.038 0.038	0.945
RAJAN004 RAJAN004-02- 12H, 2012	Pea, field Meadow	Canada Outlook	2	0.13120.1314	0.0937– 0.0939	71	6 6	1.0 1.1 1.0	0.039 0.040 0.04	1.09
RAJAN004 RAJAN004-03- 12H, 2012	Pea, field Admiral	USA Carring- ton	2	0.13080.1357	0.0934– 0.0969	73	7 7	1.3 1.3 1.3	0.055 0.048 0.052	1.35
RAJAN004 RAJAN004-04- 12H, 2012	Pea, field Meadow	Canada Kenaston	2	0.13030.1311	0.0931– 0.0936	73	8 8	0.67 0.55 0.61	0.027 0.025 0.026	0.637
RAJAN004 RAJAN004-05- 12H, 2012	Pea, field Meadow	Canada Waldheim	2	0.1326–0.133	0.0947– 0.0950	71	6 6	0.79 0.77 0.78	0.033 0.031 0.032	0.813
RAJAN004 RAJAN004-06- 12H, 2012	Pea, field Meadow	Canada Alvena	2	0.1329	0.0949	72	6 6	1.6 1.4 1.5	0.039 0.038 0.385	1.54
RAJAN004 RAJAN004-07- 12H, 2012	Pea, field Meadow	Canada Wakaw	2	0.13090.1339	0.0935– 0.0956	71	6 6	0.73 1.1 0.915	0.035 0.038 0.037	0.953
RAJAN004 RAJAN004-08- 12H, 2012	Pea, field Thunder- bird	Canada Joseph- burg	2	0.12660.1341	0.0904– 0.0958	75	7 7	1.2 1.0 1.1	0.051 0.041 0.046	1.15
RAJAN004 RAJAN004-09- 12D, 2012	Pea, field Meadow	Canada Rosthern	2	0.108–0.1082	0.0771– 0.0773	69	0 0 3 3 7 7 13 13	2.4 3.1 1.7 1.6 <u>2.3</u> <u>1.6</u> <u>1.95</u> 0.67 0.73	0.013 0.011 0.030 0.032 <u>0.035</u> <u>0.023</u> <u>0.029</u> 0.032 0.030	1.98

FL=Formulation

No=number of applications

GS=growth stage at last application

DAT=Days after last treatment

TFS: trifloxystrobin

[a].Residues were measured in green materials.

Table 12 Residue in/on pea hay derived from trials conducted with 325 SC trifloxystrobin in/on pea in Canada

Study Trial No. Plot No. Year			Application					Residues [a] [mg/kg]		
	Crop Variety	Country	No	kg/ha (as)	kg/hL (as)	GS	DAT	TFS	CGA 321113	Sum
RAJAN004 RAJAN004-01- 12H, 2012	Pea, field Meadow	Canada Whitecap	2	0.1301– 0.1305	0.0929– 0.0932	72	6 6	2.2 6.2 4.2	0.18 0.43 0.305	4.51
RAJAN004 RAJAN004-02- 12H, 2012	Pea, field Meadow	Canada Outlook	2	0.1312– 0.1314	0.0937– 0.0939	71	6 6	5.4 6.6 6.0	0.29 0.35 0.32	6.33

Study Trial No. Plot No. Year			Application					Residues [a] [mg/kg]		
	Crop Variety	Country	No	kg/ha (as)	kg/hL (as)	GS	DAT	TFS	CGA 321113	Sum
RAJAN004 RAJAN004-03- 12H, 2012	Pea, field Admiral	USA Carrington	2	0.1308– 0.1357	0.0934– 0.0969	73	7 7	2.1 2.1 2.1	0.13 0.041 0.086	2.19
RAJAN004 RAJAN004-04- 12H, 2012	Pea, field Meadow	Canada Kenaston	2	0.1303– 0.1311	0.0931– 0.0936	73	8 8	3.1 3.1 3.1	0.15 0.18 0.165	3.27
RAJAN004 RAJAN004-05- 12H, 2012	Pea, field Meadow	Canada Waldheim	2	0.1326– 0.133	0.0947– 0.0950	71	6 6	3.5 3.1 3.3	0.30 0.25 0.275	3.58
RAJAN004 RAJAN004-06- 12H, 2012	Pea, field Meadow	Canada Alvena	2	0.1329	0.0949	72	6 6	6.6 6.8 6.7	0.31 0.49 0.40	7.11
RAJAN004 RAJAN004-07- 12H, 2012	Pea, field Meadow	Canada Wakaw	2	0.1309– 0.1339	0.0935– 0.0956	71	6 6	6.0 4.6 5.3	0.24 0.26 0.25	5.56
RAJAN004 RAJAN004-08- 12H, 2012	Pea, field Thunder- bird	Canada Joseph- burg	2	0.1266– 0.1341	0.0904– 0.0958	75	7 7	8.2 5.3 6.75	0.23 0.15 1.19	6.95
RAJAN004 RAJAN004-09- 12D,2012	Pea, field Meadow	Canada Rosthern	2	0.108– 0.1082	0.0771– 0.0773	69	0 0 3 3 7 7 13 13	15 13 7.2 6.6 3.1 2.9 3.0 3.0 1.6	0.37 0.35 0.21 0.22 0.17 0.16 0.165 0.25 0.33	3.17

FL=Formulation

No=number of applications

GS=growth stage at last application

DAT=days after last treatment

TFS: trifloxystrobin

[a] Residues were measured in hay,

Fate of residues in storage and processing

The effect of processing on trifloxystrobin residues was investigated in soya beans in the USA. In one trial, three foliar spray applications at rates of 0.446–0.471 kg trifloxystrobin/ha were made to soya beans with a 8 to 9-day interval between applications. Soya beans were harvested at normal maturity at a 19-day after last application (Beedle, EC and Harbin, AM 2005b.). Subsamples of the soya bean seed were removed for analysis. The remainder of the soya bean seed was used to generate aspirated grain fractions and then processed into hulls, meal, and refined oil. Processing was performed using batch procedures that simulated commercial processing practices. The residues of trifloxystrobin and CGA 321113 were determined according to method 200177. The individual analyte residues were summed to give a total trifloxystrobin residue. The limit of quantitation (LOQ) for total trifloxystrobin residue was 0.01 mg/kg in soya bean seed, hulls, meal, and refined oil, and 0.10 mg/kg in soya bean aspirated grain fractions.

Table 13 Results of processing soya beans treated with trifloxystrobin

Crop Variety	Application			Portion analysed	Residues [mg/kg]			
	FL	No	kg/ha (as)		TFS	CGA 321113	Total	Pf
S56-D7	250 EC	3	0.223- 0.235	seed	0.223	0.038	0.261	–
				hull	0.116	< 0.01	0.124	0.48
				meal	< 0.01	< 0.01	< 0.01	< 0.04
				oil, refined	0.034	< 0.01	0.034	0.13

Crop Variety	Application			Portion analysed	Residues [mg/kg]			
	FL	No	kg/ha (as)		TFS	CGA 321113	Total	Pf
				aspirated grain fractions	16.1	2.08	18.2	69.7

Residues in animal commodities

Dairy and poultry feeding studies were submitted for the 2004 JMPR review.

APPRAISAL

Trifloxystrobin was first evaluated by the JMPR in 2004 (T, R) and in 2012 (R). The 2004 Meeting established an ADI of 0–0.04 mg/kg bw and decided that ARfD was not necessary. The Meeting agreed that the residue definition for enforcement purposes for plant commodities should be trifloxystrobin per se, for animal commodities and dietary intake assessment the residue definition should be parent compound and CGA 321113 (expressed as trifloxystrobin equivalents) for plant and animal commodities.

Trifloxystrobin 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 dry soya bean, lentil, chick pea and pea.

Analytical methods used for supervised trials were also provided.

Analytical methods

The Meeting received descriptions and validation data for analytical methods for residues of trifloxystrobin, CGA 321113 and several other metabolites in different plant matrices.

The plant materials are generally extracted with a mixture of acetonitrile/water. After filtration and concentration to the aqueous remainder, the acidified crude extract is purified, where necessary, by liquid-liquid partition. The residues are quantified by reverse-phase HPLC with MS/MS-detection. The average recoveries of trifloxystrobin and CGA 321113 and their relative standard deviations from test portions spiked at 0.01–2 mg/kg levels were for peas (100–101%, 3.1–4.7%) and soya beans (86–91%, 6.4, 19%). The limits of quantification ranged between 0.01–0.02 mg/kg.

The DFG method S19, evaluated in 2004, is suitable for enforcement.

Residues resulting from supervised trials on crops

The sum of trifloxystrobin and CGA 321113 was calculated and expressed as trifloxystrobin on the basis of the relative molecular masses. A conversion factor of 1.036 is required to express CGA 321113 as trifloxystrobin. As CGA 321113 does not generally constitute a significant proportion of the residue in crops, when the levels of trifloxystrobin or CGA 321113 were below the LOQ, their sum was calculated according to the method used by the 2004 JMPR.

Trifloxystrobin (mg/kg)	CGA 321113 (mg/kg)	Total (expressed as trifloxystrobin) (mg/kg)
< 0.01	< 0.01	< 0.01
< 0.01	0.011	0.021
0.10	< 0.02	0.10
0.92	0.16	1.1

In field trials duplicate samples were taken from each treated plot. Of the duplicate results the non-detected residues were disregarded in the calculation of average residue. As a conservative

approach, if the residues measured were 0.015 and < 0.01, the calculated average was taken as 0.015 mg/kg.

Pulses

Soya bean

The GAP in Canada allows maximum 2 times 0.0625 kg/ha treatment with a 20 day PHI. In 4 trials conducted according to GAP the residues in soya bean seeds were < 0.01 mg/kg (4).

The Brazilian GAP permits up to 4 treatments with 0.060 kg/ai/ha or 2 treatments with 0.075 kg ai/ha with a PHI of 20 days. Following treatment according to GAP the trifloxystrobin residues were below the LOQ (< 0.01 or < 0.02 mg/kg). CGA 321113 residues occurred in seven samples at 0.01–0.02 mg/kg level.

The US GAP permits 3 applications at rates between 0.0913–0.127 kg ai/ha and a PHI of 21 days. In 2003 a total of 20 trials were conducted in the USA applying trifloxystrobin three times at rates of 0.086–0.095 kg ai/ha. In addition, another 20 trials were performed in 2005 with application rates of 0.13 kg ai/ha and samples were taken at 21 days. Duplicate samples were taken from each site.

The US use patterns represent the critical GAP. The nominal application rates in US trials are within ± 25% of the GAP. The residues of parent compound in rank order were: < 0.01 (28), 0.01 (4), 0.012, 0.014, 0.016 (2), 0.021, 0.027, and 0.041mg/kg.

The sum of residues were in rank order: < 0.01 (24), 0.012 (4), 0.021 (2), 0.023 (2), 0.024, 0.025, .026, 0.027, 0.039, 0.043, 0.057 and 0.058 mg/kg.

The Meeting estimated a maximum residue level of 0.05 mg/kg for trifloxystrobin in soya beans, and an STMR residue of 0.01 mg/kg for the sum of trifloxystrobin and CGA 321113.

Beans and peas, dry

The use of trifloxystrobin in/on dry pea, chickpea and lentil is registered in Canada and the USA.

Nine trials were conducted on dry peas and nine trials on dry beans according the GAP in Canada (1-2 application with 0.132 kg ai/ha, the PHI is 30 days). Duplicate samples were taken at each sampling interval.

In beans, the average residues of trifloxystrobin at about 30 days were < 0.01 mg/kg in all (9) samples.

The sum of trifloxystrobin and CGA 321113 residues expressed as trifloxystrobin were in rank order: < 0.01 (5), 0.021 (2), 0.022, and 0.023 mg/kg.

In peas, the residues of trifloxystrobin at about 30 days were all < 0.01 mg/kg in all (9) samples.

The sum of residues of trifloxystrobin and CGA 321113 expressed as trifloxystrobin (mg/kg) at about 30 days were: < 0.01 (3), 0.021 (2), 0.022, 0.023, 0.027 and 0.033 mg/kg.

The use pattern is the same for beans and peas and the residues are not different. Consequently the residue datasets can be combined for mutual support.

The residues of trifloxystrobin in dry bean and pea seeds were < 0.01 mg/kg.

The sum of residues in beans and peas in rank order were: < 0.01 (8), 0.021 (4), 0.022, 0.023 (2), 0.025, 0.027 and 0.033 mg/kg.

As the use pattern for lentils is the same as for beans and peas, the Meeting decided that the database is sufficient for making recommendation for these three commodities.

The Meeting estimated a maximum residue level of 0.01* mg/kg and an STMR residue of 0.021 mg/kg for dry beans, lentils, and pea.

Animal feed

Soya bean forage and hay

Altogether 40 trials were conducted in USA in accordance with registered use patterns. Residues in forage and hay were measured and reported. However, grazing animals on soya bean fields or using forage and hay as animal feed are not permitted, therefore the results of trials were not evaluated.

Pea forage and hay

The average residues of trifloxystrobin and CGA 321113 measured in pea green materials (pea vine) obtained from trials conducted according to Canadian GAP are listed below.

Trifloxystrobin residues: 0.61, 0.78, 0.91, 0.92, 1.05, 1.10, 1.30, 1.50 and 1.95 mg/kg.

The sum of trifloxystrobin and CGA 321113 residues: 0.64, 0.81, 0.94, 0.95, 1.09, 1.15, 1.35, 1.54 and 1.98 mg/kg.

The Meeting estimated highest residue of 2 mg/kg and median residue of 1.1 mg/kg for the sum of trifloxystrobin and CGA321113 in pea vine for animal burden calculations.

The residues of trifloxystrobin and CGA 321113 (TFSA) measured in pea hay obtained from trials conducted according to Canadian GAP are listed below. Trifloxystrobin residues: 2.1, 3.0, 3.1, 3.3, 4.2, 5.3, 6.0, 6.7 and 6.8 mg/kg.

The sum of residues were in rank order: 2.2, 3.2, 3.3, 3.6, 4.5, 5.6, 6.3, 6.9 and 7.1 mg/kg

The Meeting estimated a maximum residue level of 17 mg/kg (dry weight) for peanut hay.

The Meeting estimated highest residue of 7.1 mg/kg and median residue of 4.5 mg/kg for the sum of trifloxystrobin and CGA321113 in pea hay for animal burden calculation.

Fate of Residues in Storage and Processing

Soya bean was treated with trifloxystrobin three times at a rate of 0.446–0.471 kg/ha and harvested 19 days after last application. The average total trifloxystrobin residue was 0.26 mg/kg in soya bean seed (raw agricultural commodity (RAC)), 18.2 mg/kg in soya bean aspirated grain fractions, 0.12 mg/kg in hulls, < 0.01 mg/kg in meal, and 0.03 mg/kg in refined oil. Concentration of the total trifloxystrobin residue was seen only in the soya bean aspirated grain fractions (processing factor about 70). No concentration of the total trifloxystrobin residue was seen in soya bean hulls, meal, or refined oil.

For the purpose of animal burden calculation, the Meeting estimated median residue of 0.7 mg/kg for aspirated grain fraction, 0.01 mg/kg for hull and < 0.0008 mg/kg for meal of soya bean.

Residues in animal commodities

Animal feeding studies were evaluated by the 2004 Meeting. Dairy cows were dosed with trifloxystrobin in capsules at the equivalent of 2, 5.9 or 21 ppm in the diet for 28–30 days. The residues measured in various samples are summarized below:

Sample	Day	Maximum trifloxystrobin residues (mg/kg)								
		Dose 2 ppm			Dose 5.9 ppm			Dose 21 ppm		
		Parent	321113	Total	Parent	321113	Total	Parent	321113	Total
Milk	26	-	-	-	-	-	-	< 0.01	< 0.01	< 0.02
Liver	28-30	< 0.02	< 0.02	< 0.04	< 0.02	< 0.02	< 0.04	< 0.02	0.09	0.11
Kidney	28-30	< 0.02	< 0.02	< 0.04	< 0.02	< 0.02	< 0.04	< 0.02	0.02	0.04
Perirenal fat	28-30	< 0.02	< 0.02	< 0.04				0,06	< 0.02	0.08
Omental fat	28-30	< 0.02	< 0.02	< 0.04	< 0.02	< 0.02	< 0.04	0.05	< 0.02	0.07
Round	28-30	-	-	-	-	-	-	< 0.02	< 0.02	< 0.04
Tenderloin	28-30	-	-	-	-	-	-	< 0.02	< 0.02	< 0.04

Laying hens were dosed at 1.5, 4.5 and 15 ppm level for 29 days. At the highest treatment level no residues (< 0.02 mg/kg) were detected in composite tissue samples of breast plus thigh, skin plus attached fat, peritoneal fat, liver and eggs.

The Meeting estimated the dietary burden of trifloxystrobin in farm animals on the basis of the diets listed in Annex 6 of the 2009 JMPR Report and using the estimated residues in livestock feed commodities evaluated by the present and previous Meetings.

	Trifloxystrobin animal dietary burden, ppm, of dry matter diet							
	US-Canada		EU		Australia		Japan	
	Max	Mean	Max	Mean	Max	Mean	Max	Mean
Beef cattle	2.17	1.15	26.6[a]	6.97[b]	8.24	5.00	4.53	0.84
Dairy cattle	2.79	1.27	23.2[c]	6.37[d]	8.21	4.11	2.11	0.43
Poultry - broiler	0.11	0.11	0.069	0.069	0.15	0.15	0.03	0.03
Poultry – layer	0.11	0.11	1.83[e]	0.78[f]	0.15	0.15	0.079	0.079

[a] Suitable for estimation maximum residue levels in meat

[b] Suitable for estimation of median residues in meat

[c] Suitable for estimation maximum residue levels in milk

[d] Suitable for estimation median residue levels in milk

[e] Suitable for estimation maximum residue levels in poultry meat and edible offal

[f] Suitable for estimation median residue levels in poultry meat and edible offal

The maximum dietary burden of beef cattle and dairy cattle is about 30% higher than the maximum feeding level of 21 ppm. The Meeting concluded that the residues observed at the highest feeding level can still be used as a basis for estimation of maximum residues in meat, offal and milk.

The Meeting concluded that the current Codex limits cover the residues derived from the uses of trifloxystrobin and maintains its previous recommendations.

RECOMMENDATIONS

On the basis of the data from supervised trials the Meeting concluded that the residue levels listed in Annex 1 to the Report were suitable for establishing maximum residue limits and for IEDI assessment.

CCN	Commodity Name	MRL, mg/kg proposed	previous	STMR or STMR-P mg/kg
VD0071	Beans, dry	0.01*		0.021
VD0533	Lentils	0.01*		0.021
VD4511	Pea, dry	0.01*		0.021
VD0541	Soya bean	0.05		0.01

DIETARY RISK ASSESSMENT

Long-term intake

The International Estimated Daily Intakes (IEDIs) of trifloxystrobin were calculated for the 17 GEMS/Food cluster diets using STMRs and STMR-Ps estimated by the JMPR in 2004, 2012 and the current meeting. The results are shown in Annex 3 to the 2015 Report.

The ADI is 0–0.04 mg/kg bw and the calculated IEDIs were 1–4% of the maximum ADI. The Meeting concluded that the long-term intake of residues of trifloxystrobin from the uses considered by the JMPR is unlikely to present a public health concern.

Short-term intake

The 2004 JMPR decided that it was unnecessary to establish an ARfD. The present Meeting therefore concluded that the short-term intake of trifloxystrobin residues is unlikely to present a public health.

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