PYRACLOSTROBIN (210)

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EXPLANATION

Pyraclostrobin pyraclostrobin is a fungicide belonging to the group which is collectively known as strobilurins, which inhibit mitochondrial respiration. This leads to a reduction of energy-rich ATP that is available to support a range of essential processes in the fungal cell.

Pyraclostrobin was scheduled for evaluation in 2003 but the evaluation of residues was postponed to 2004.

IDENTITY

ISO common name: pyraclostrobin

Chemical name:

IUPAC: Methyl *N*-{2-[1-(4-chlorophenyl)-1*H*-pyrazol-3-yl]oxymethyl]phenyl}(*N*-methoxy)carbamate

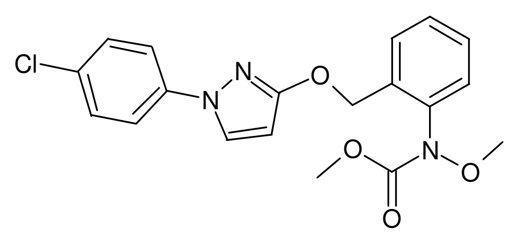
CA: Methyl [2-[[[1-(4-chlorophenyl)-1*H*-pyrazol-3-yl]oxy]methyl]phenyl]methoxycarbamate

CAS No: 175013-18-0

CIPAC No: not assigned

Synonyms: BAS 500 F, LAB 304428, Reg.No. 304428, PS 304428

Structural formula:



Molecular formula: $C_{19}H_{18}ClN_3O_4$
Molecular weight: 387.82

Physical and chemical properties

<u>Pure active ingredient</u>

Purity: 99.8%

Melting point: 3.7- 65.2°C OECD 102 (Türk, 1996g)

Temperature of decomposition	A melting curve from 50°C to 360°C with a heating rate of 10K/min. showed an endothermic melting peak at about 65°C and an exothermic effect at about 200°C which was related to decomposition. There was no endothermic effect not related to the melting point, so sublimation or boiling of the test substance can be excluded.
Relative density	1.367 g/cm^3 OECD 109 (Kästel, 1997)
Vapour pressure	$2.6.10^{-10}$ hPa at 20°C and $6.4.10^{-10}$ hPa at 25°C EEC A.4 (Kästel R., 1997, 1997/10646)
Henry's law constant	$5.307.10^{-9}$ kPa .m³.mol^{-1}. (Ohnsorge, 2000)
Colour	white or light beige (Türk, 1996g)
Physical state	crystalline solid
Odour	odourless
UV spectrum	molecular extinction ε = $2.5.10^4$ l.mol^{-1}.cm^{-1} at 205 nm $2.4.10^4$ l.mol^{-1}.cm^{-1} at 275 nm
Solubility in water	1.9 ± 0.17 mg/l at 20°C in deionised water at pH 5.8 (Türk, 1996c)
Solubility in organic solvents, g/100 ml	n-heptane 0.37 2-propanol 3.0 1-octanol 2.42 methanol 10.08 acetone, acetonitrile > 50 dichloromethane > 50 ethyl acetate and toluene > 50 (Türk, 1996d)
n-octanol/water coefficient	log P_{OW} = 3.99; P_{OW} = 9772 (OECD 117) (Türk, 1996b)
Dissociation in water	no indication of dissociation in water (OECD 112) (Türk, 1996c)
Photochemical oxidative degradation	rate constant for the reaction of pyraclostrobin with OH radicals: k = 206.3747 x 10^{-12} cm^3/molecule.s atmospheric degradation half-life: 1.87 h (Scharf, 1999b)

<u>Technical material</u>

Purity	98.5%
Relative density	1.285 g/cm^3 OECD 109 (Kästel, 1997)
Colour	dark brown solid (Kästel, 1998)
Physical state	(solidified melt)
Odour	moderate aromatic odour (Kästel, 1998)

Hydrolysis rate: pyraclostrobin is stable in aqueous solution in the dark at pH 4, 5 and 7 (25°C and 50°C). At pH 9 a very slow degradation was observed at ambient temperature. No half-lives were determined at either 50°C or 25°C because they exceeded twice the duration of the study, and no half-life at 20°C could be calculated. Only at 50°C and pH 9 were the concentrations of BF 500-5 and/or BF 500-7 close to or slightly above 10% of the TAR. A degradation path was proposed from the study. (^{14}C-labelled pure ai, purity 94-95% US-EPA Subdivision N § 161-1) (Scharf, 1999a)

Direct photolysis of purified active substance in water: The major photodegradation products occurring with concentrations above 10% of the TAR were 500M78 (half-life 4.62 days), BF 500-13 (half-life 30.67 days), 500M58 (half-life 8.64 days), BF 500-14 (half-life 0.28 days), and BF 500-11 (no reasonable half-life could be estimated using the compartment model). A degradation pathway was proposed. The average material balance ranged from 97.5 to 98.7% of that applied (^{14}C-labelled pure ai, purity 97.7 and 98.1%). (US-EPA Subdivision N § 161-2).
The quantum yield of pyraclostrobin was estimated to be 2.17×10^{-1}.according to US-EPA Subdivision N, § 161-2 (Scharf 1999f).

Flammability: not flammable under test conditions (EEC A.10) (Löffler, 1998).

Autoflammability: 510°C (EEC A.15) (Löffler, 1998).

Flash point: 132°C. (EEC A.9) (Kästel, 1998)

Explosive properties: pyraclostrobin has no explosive potential (EEC A.14). (Löffler, 1998)

Surface tension: 71.8 mN/m at 0.5% (w/w) and 71.5 mN/m at 2.0% (w/w) (EEC A5. 1.6.1) (Kästel, 1998).

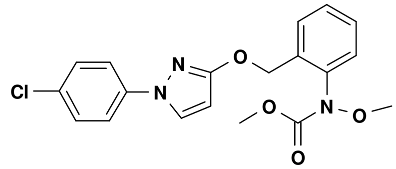
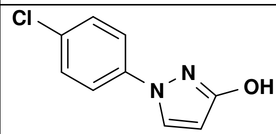
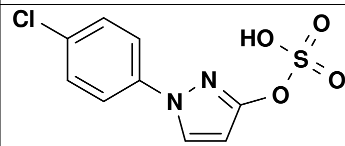
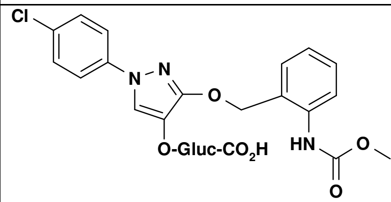
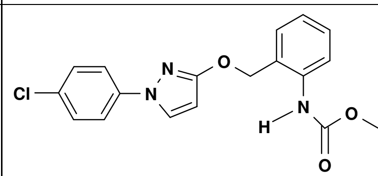
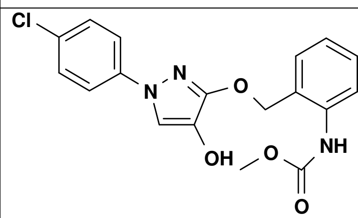
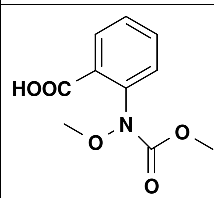
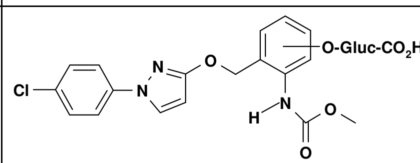
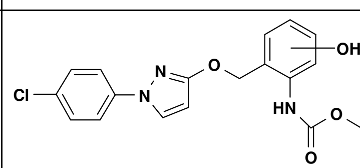
Oxidising properties: not considered to be an oxidising agent (EEC A.17). (Löffler, 1998).

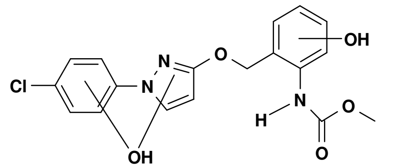
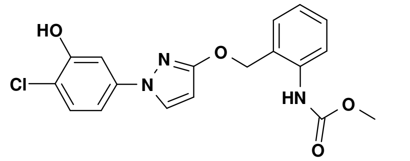
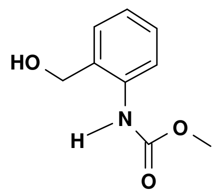
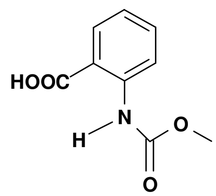
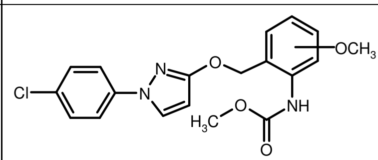
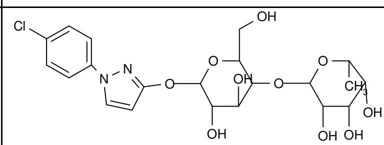
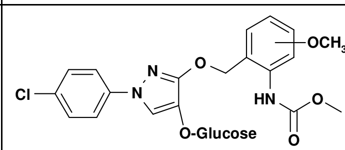
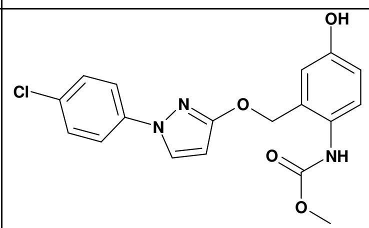
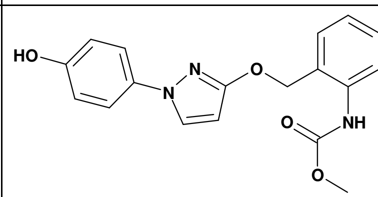
Formulations

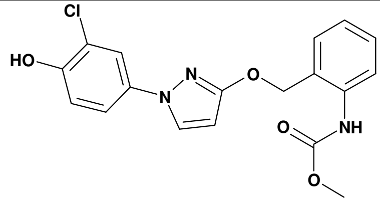
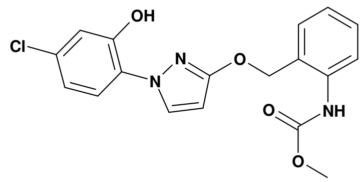
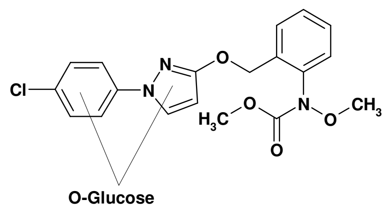
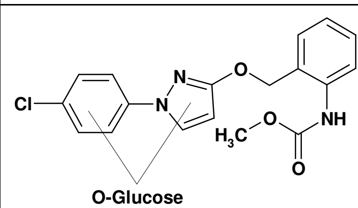
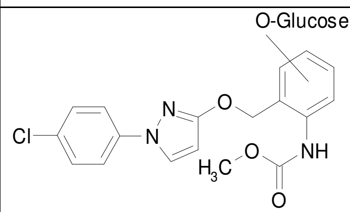
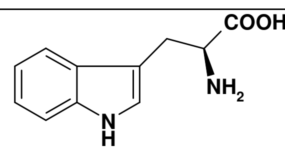
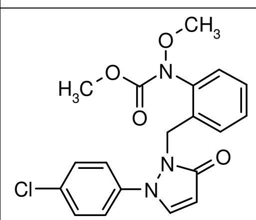
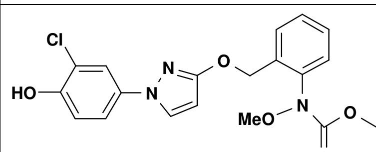
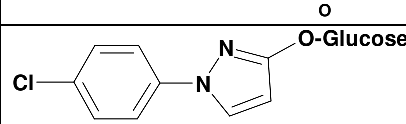
Table 1. Type and composition of formulations.

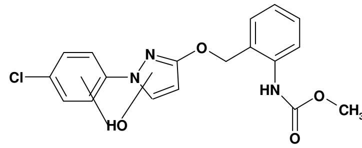
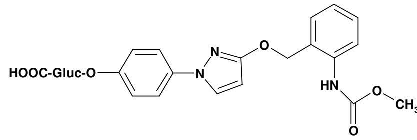
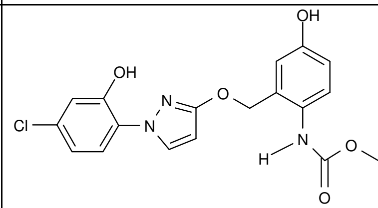
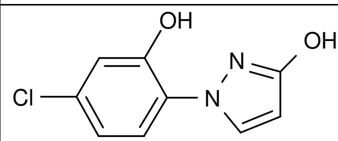
BAS	**500 00F**	**500 01F**	**500 02F**	**512 00F**	**513 00F**	**518 01F**	**525 00F**	**536 00F**
	g/l	g/l	%	g/l	g/l	%	g/l	%
Type	EC	EC	WG	SE	SE	WG	SE	WG
Component								
Pyraclostrobin	250	250	20	133	133	5	200	6,7
Epoxiconazole				50	50			
Kresoxim-methyl (1)					67			
Metiram (2)						55		
KIF 230							70	
Dimethomorph (3)								12

Table 2. Pyraclostrobin metabolites identified in rats, goats, hens and plants

Compound		Structure	Rat	Goat	Hen	Plant
Code	Reg. No. (BF code)					
500M00	304428 (pyraclostrobin)		x	x	x	x
500M04	298327 (BF 500-5)		x	x	x	x
500M05	n.a.		x	x		
500M06	n.a.		x		x	
500M07	340266 (BF 500-3)		x	x	x	x
500M08	n.a.		x	x		
500M24	n.a.		x			x
500M32	n.a.		x		x	
500M34	n.a.		x	x		x

Compound		Structure	Rat	Goat	Hen	Plant
Code	Reg. No. (BF code)					
500M39	n.a.		X	X	X	
500M45	n.a.		X	X		
500M49	n.a.		X	X	X	
500M51	n.a.		X	X		
500M54	n.a.					X
500M55	n.a.					X
500M56	n.a.					X
500M64	n.a.		X	X	X	
500M65	n.a.			X		

Compound		Structure	Rat	Goat	Hen	Plant
Code	Reg. No. (BF code)					
500M66	n.a.			x	x	
500M67	n.a.			x		
500M68	n.a.					x
500M70	n.a.					x
500M71	n.a.					x
500M72	L-tryptophan					x
500M76						x
500M77	4001763 (BF 500-16)				x	
500M79	n.a.					x

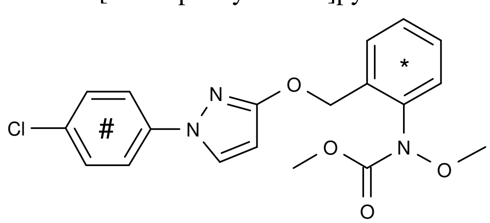
Compound		Structure	Rat	Goat	Hen	Plant
Code	Reg. No. (BF code)					
500M80	n.a.				x	
500M83	n.a.				x	
500M84	n.a.			x		
500M85	399530 (BF 500-8)			x		

METABOLISM AND ENVIRONMENTAL FATE

Animal metabolism

Metabolism studies on lactating goats and laying hens were reported. Rat metabolim was reviewed by the WHO Core Assessment Group in 2003.

The metabolism and distribution in plants and livestock of pyraclostrobin was investigated with [tolyl-U-^{14}C]pyraclostrobin and [chlorophenyl-U-^{14}C]pyraclostrobin.



* tolyl label
\# chlorophenyl label

<u>Goats</u>. The metabolism and distribution of tolyl- and chlorophenyl-lablled [^{14}C]pyraclostrobin was investigated by Leibold *et al.* (1998a); and Bross and Tilting (2000) in lactating goats. Each test compound was administered daily on 5 consecutive days at nominal dose levels of 12 mg/kg feed to two goats and 50 mg/kg feed to one goat. The low dose was administered orally by capsule. The high dose (dissolved in Pluriol E and 0.5% tylose) was given by an intubation catheter through the mouth.

The low dose was intended to be close to the expected residue level in plant feed items, to judge whether residues are likely to occur in ruminants under normal agricultural practice. The high dose was to facilitate metabolite identification and characterization.

Table 3. Dosing of lactating goats with [^{14}C]pyraclostrobin for five days, with slaughter 23 h after last dose.

Dose group (label)	No. of animals	Nominal daily dose	Actual daily dose	
		[mg/kg feed intake]	[mg/kg feed intake]	[mg/kg bw]
Low dose (chlorophenyl)	2	12	12.6 11.8	0.9 1.0
Low dose (tolyl)	2	12	11.9 12.5	0.65 0.75
High dose (chlorophenyl)	1	50	78.1	2.72
High dose(tolyl)	1	50	69.7	1.37

The radioactivity was rapidly and almost completely excreted (Table 4 and Table 5). Excretion was mainly through the faeces which contained 39 to 64% of the dose, with 9 to 23% in the urine. The radioactivity recovered from urine and faeces together with the cage wash ranged from 73 to 92% of the total radioactivity recovered, which was in the range of 71 to 91% of the dose, including both labels.

Table 4. Material balance after administration of [chlorophenyl-^{14}C]pyraclostrobin to lactating goats

Sample	^{14}C recovered as % of total dose	
	Low dose (Animal 3/Animal 4)	High dose
Organs and tissues:		
Liver	0.11/0.12	0.23
Kidney	0.00/0.00	0.01
Muscle	0.05/0.04	0.09
Fat	0.06/0.02	0.24
Milk	0.21/0.31	0.54
Gut, Bile, Urine in bladder, Lung, Heart, Blood, Cage wash, Skin, Stomach	9.48/7.04	12.25
Urine	12.38/11.43	22.93
Faeces	48.35/61.16	39.28
Total	70.63/80.09	75.58

Table 5. Material balance after administration of [tolyl-^{14}C]pyraclostrobin to lactating goats.

Sample	^{14}C recovered as % of total dose	
	Low dose(Animal 1/Animal 2)	High dose
Organs and tissues:		
Liver	0.25/0.19	0.24
Kidney	0.01/0.01	0.01
Muscle	0.09/0.07	0.09
Fat	0.11/0.05	0.06
Milk	0.11/0.11	0.20
GUT, Bile, Urine in bladder, Lung, Heart, Blood, Cage wash, Skin, Stomach	6.55/10.76	24.38
Urine	10.98/9.07	13.70
Faeces	63.67/54.09	52.63
Total	81.87/74.34	91.32

The tissue samples of each pair, and the milk samples of all four low-dose goats were pooled for analysis. The total radioactive residues in milk, muscle, fat, liver and kidney were determined by combustion. Samples were extracted with methanol or acetonitrile/water. Acetonitrile extracts of milk and fat were partitioned against hexane to remove fat. The extractable radioactive residues were characterized and quantified by radio-HPLC. Major metabolites present in the methanolic or acetonitrile extracts were identified by co-chromatography with compounds isolated from the urine or faeces of the test animals, which were identified by MS and NMR. For the characterization of the non-released radioactivity in liver and kidney, the radioactive residue that was not extractable with organic solvents and water was further treated with pronase and/or subjected to acid hydrolysis.

The total radioactive residues (TRR) are shown in Table 6. Those from the low dose were low, from 0.018 mg/kg to 0.383 mg/kg. The TRR values for the two labels were comparable for all samples.

In the high-dose samples the TRR were higher; from 0.063 mg/kg to 1.505 mg/kg.

Table 6. TRR in edible products after dosing lactating goats with [^{14}C]pyraclostrobin

Sample	TRR, mg/kg as pyraclostrobin			
	12 mg/kg feed		50 mg/kg feed	
	chlorophenyl label	tolyl label	chlorophenyl label	tolyl label
Milk	0.038	0.026	0.382	0.127
Muscle	0.018	0.022	0.117	0.063
Fat	0.094	0.082	0.928	0.380
Liver	0.241	0.383	1.505	0.828
Kidney	0.054	0.085	0.335	0.316

About 80% to 100% of the TRR could be extracted from milk, muscle and fat, but only 56% to 85% from kidney, and less than 40% from liver. The extraction results are shown in Tables 7 and 8.

Table 7. Extractability of milk and tissues after dosing lactating goats with chlorophenyl-labelled pyraclostrobin, residues as ^{14}C, mg/kg and (% of TRR).

Sample	TRR	Methanol or acetonitrile	Hexane	Water	Total extracted	Unextracted	Recovery
12 mg/kg feed							
Milk	0.038 (100%)	0.034 (90.1%)	0.002 (4.7%)	n.a.	0.036 (94.7 %)	0.002 (5.8%)	0.038 (100.5%)
Muscle	0.018 (100%)	0.016 (88.1%)	n.a.	0.001 (4.9%)	0.017 (93.0 %)	0.001 (7.2%)	0.018 (100.2%)
Fat	0.094 (100%)	0.089 (95.1%)	0.006 (5.7%)	n.a.	0.095 (100.8%)	0.008 (8.2%)	0.103 (109.0%)
Liver	0.241 (100%)	0.081 (33.6%)	n.a.	0.003 (1.4%)	0.084 (35.0 %)	0.163 (67.5%)	0.247 (102.5%)
Kidney	0.054 (100%)	0.043 (79.2%)	n.a.	0.003 (5.1%)	0.046 (84.3%)	0.007 (13.7%)	0.053 (98.0%)
50 mg/kg feed							
Milk	0.382 (100%)	n.a.	0.363 (95.0%)	0.003 (0.9%)	0.366 (95.9 %)	0.017 (4.4%)	0.383 (100.3%)
Muscle	0.117 (100%)	0.099 (84.3%)	n.a.	n.a.	0.099 (84.3 %)	0.013 (11.1%)	0.112 (95.4%)
Fat	0.928 (100%)	n.a.	0.901 (97.0 %)	0.014 (1.5%)	0.915 (98.5 %)	0.012 (1.3%)	0.927 (99.8%)
Liver	1.505 (100%)	0.434 (28.9%)	n.a.	0.051 (3.4%)	0.485 (32.3%)	0.997 (66.3%)	1.482 (98.6%)
Kidney	0.335 (100%)	0.278 (83.0%)	n.a.	0.007 (2.2%)	0.285 (85.2%)	0.055 (16.3%)	0.340 (101.5%)

n.a.: not applicable

Table 8. Extractability of milk and tissues after dosing lactating goats with [^{14}C-tolyl]pyraclostrobin, residues as ^{14}C, mg/kg and (% of TRR).

Sample	TRR	Acetonitrile	Hexane	Water	Total extracted	Unextracted	Recovery
12 mg/kg feed							
Milk	0.026 (100%)	0.020 (75.8%)	0.001 (4.5%)	n.a.	0.021 (80.3%)	0.005 (17.5%)	0.025 (97.8%)
Muscle	0.022 (100%)	0.017 (77.6%)	n.a.	0.001 (4.7%)	0.018 (82.3%)	0.003 (15.3%)	0.021 (97.6%)
Fat	0.082 (100%)	0.077 (94.2%)	0.005 (5.8%)	n.a.	0.082 (100%)	0.009 (10.5%)	0.091 (110.5%)
Liver	0.383 (100%)	0.088 (23.1%)	n.a.	0.010 (2.5%)	0.098 (25.6 %)	0.286 (74.6%)	0.384 (100.2%)
Kidney	0.085 (100%)	0.040 (47.0%)	n.a.	0.008 (9.1%)	0.048 (56.1 %)	0.031 (36.7%)	0.079 (92.8%)
50 mg/kg feed							
Milk	0.127 (100%)	n.a.	0.116 (91.5%)	0.003 (2.3%)	0.119 (93.8 %)	0.014 (10.7)	0.133 (104.5%)
Muscle	0.063 (100%)	0.053 (83.4%)	n.a.	n.a.	0.053 (83.4%)	0.012 (18.9%)	0.059 (102.3%)
Fat	0.380 (100%)	n.a.	0.376 (98.8%)	0.007 (1.9%)	0.383 (100.7 %)	0.010 (2.7%)	0.393 (103.4%)
Liver	1.013 (100%)	0.349 (34.4%)	n.a.	0.030 (2.9%)	0.379 (37.3 %)	0.681 (67.3%)	1.060 (104.6%)
Kidney	0.316 (100%)	0.226 (71.6%)	n.a.	0.019 (6.0%)	0.245 (77.6%)	0.079 (24.8%)	0.324 (102.4%)

n.a.: not applicable

In goats, pyraclostrobin is metabolised by three key transformation steps: (1) demethoxylation at the oxime ether bond (2) hydroxylation of the chlorophenyl, the pyrazole and/or the tolyl rings and (3) cleavage between the pyrazole and tolyl ring systems with subsequent oxidation of the two resulting fragments. The identified compounds are shown in Tables 9-12. In milk, liver and kidney, pyraclostrobin and the demethoxy metabolite 500M07 were quantified together.

<u>Note</u>. Chemical names listed in the Tables do not necessarily conform to ether IUPAC or CA practice.

Table 9.Residues in goat tissues and milk after dosing with chlorophenyl-labelled [^{14}C]pyraclostrobin (nominal dose 12 mg/kg based on feed intake).

<table>
<tr><th rowspan="2">Compound</th><th rowspan="2">Chemical name</th><th>Milk</th><th>Muscle</th><th>Fat</th><th>Liver</th><th>Kidney</th></tr>
<tr><th colspan="5">mg/kg
(% of TRR)</th></tr>
<tr><td>BAS 500 F

(304428)</td><td>Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) N-methoxy carbamate</td><td rowspan="2">0.012
(31.6)</td><td>0.010
(57.9)</td><td>0.069
(73.4)</td><td rowspan="2">0.008
(3.1)</td><td rowspan="2">0.010
(19.6)</td></tr>
<tr><td>500M07

(340266)</td><td>Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) carbamate</td><td>0.003
(^{14}.2)</td><td>0.020
(21.7)</td></tr>
<tr><td>500M05

(n.a.)</td><td>1-(4-chlorophenyl) -1H-pyrazol-3-yl hydrogensulfate</td><td>0.012
(31.1)</td><td>n.d.</td><td>n.d.</td><td>n.d.</td><td>n.d.</td></tr>
</table>

n.d.: not detected

Table 10. Residues in goat tissues and milk after dosing with tolyl-labelled [^{14}C]pyraclostrobin (nominal dose 12 mg/kg based on feed intake).

Sample	Chemical name	Milk	Muscle	Fat	Liver	Kidney
		mg/kg (% of TRR)				
BAS 500 F (304428)	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) N-methoxy carbamate	0.010 (37.4)	0.011 (53.6)	0.061 (74.2)	0.006 (1.4)	0.007 (8.8)
500M07 (340266)	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) carbamate		0.003 (12.0)	0.016 (20.0)		

n.d.: not detected

Table 11. Residues in goat tissues and milk after dosing with chlorophenyl-labelled [^{14}C]pyraclostrobin/ (nominal dose 50 mg/kg based on feed intake).

Compound	Chemical name	Milk	Muscle	Fat	Liver	Kidney
		mg/kg (% of TRR)				
BAS 500 F (304428)	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) N-methoxy carbamate	0.067 (17.4)	0.089 (76.2)	0.819 (88.2)	0.021 (1.4)	0.074 (22.1)
500M07 (340266)	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) carbamate		0.010 (8.1)	0.082 (8.8)	0.022 (1.5)	
500M04 (298327)	1-(4-chlorophenyl) -1H-pyrazol-3-ol	0.062 (16.3)	n.d.	n.d.	0.013 (0.9)	0.015 (4.4)
500M05	1-(4-chlorophenyl) -1H-pyrazol-3-yl hydrogensulfate	0.054 ([14].1)	n.d.	n.d.	0.002 (0.1)	0.045 (13.4)
500M08	Methyl N-(2{[1-(4-chlorophenyl) 4 hydroxy-1H-pyrazol-3-yl] oxymethyl} phenyl) carbamate	0.004 (1.0)	n.d.	n.d.	0.004 (0.3)	n.d.
500M39	Hydroxylated methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} hydroxyphenyl) carbamate	n.d.	n.d.	n.d.	0.015 (1.0)	n.d.
500M45	Methyl 2{[1-(4-chloro 3 hydroxy phenyl) -1H-pyrazol-3-yl] oxy}methyl) phenylcarbamate	0.006 (2.6)	n.d.	n.d.	0.003 (0.2)	n.d.
500M64	{2-[1-(4-chlorophenyl) 1H-pyrazol-3-yl oxymethyl] 4 hydroxy- phenyl) carbamic acid methyl ester	0.010 (2.6)	n.d.	n.d.	n.d.	0.003 (1.0)
500M66	{2-[1-(3 chloro4-hydroxyphenyl) 1H-pyrazol-3-yl oxymethyl]- phenyl) carbamic acid methyl ester	0.006 (1.5)	n.d.	n.d.	0.020 (1.3)	0.004 (1.2)
500M67	{2-[1-(4 chloro 2-hydroxyphenyl) 1H-pyrazol-3-yl oxymethyl] - phenyl) carbamic acid methyl ester	0.008 (2.1)	n.d.	n.d.	0.069 (4.6)	0.043 (13.0)
500M85 (399530)	1-(4 chloro2-hydroxy phenyl) 1H-pyrazol-3oyl	0.021 (5.5)	n.d.	n.d.	0.025 (1.6)	0.022 (6.5)

n.d.: not detected

Table 12. Residues in goat tissues and milk after dosing with tolyl-labelled [^{14}C]pyraclostrobin (nominal dose 50 mg/kg based on feed intake).

<table>
<tr><th rowspan="2">Compound</th><th rowspan="2">Chemical name</th><th>Milk</th><th>Muscle</th><th>Fat</th><th>Liver</th><th>Kidney</th></tr>
<tr><th colspan="5">mg/kg
(% of TRR)</th></tr>
<tr><td>BAS 500 F
(304428)</td><td>Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) N methoxy carbamate</td><td rowspan="2">0.027
(21.4)</td><td>0.048
(76.3)</td><td>0.318
(83.4)</td><td>0.070
(8.4)</td><td rowspan="2">0.073
(23.2)</td></tr>
<tr><td>500M07
(340266)</td><td>Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) carbamate</td><td>0.005
(7.1)</td><td>0.058
(15.4)</td><td>0.024
(2.9)</td></tr>
<tr><td>500M08</td><td>Methyl N-(2{[1-(4-chlorophenyl) 4 hydroxy-1H-pyrazol-3-yl] oxymethyl} phenyl) carbamate</td><td>0.001
(0.8)</td><td>n.d.</td><td>n.d.</td><td>n.d.</td><td>n.d.</td></tr>
<tr><td>500M39</td><td>Hydroxylated methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} hydroxyphenyl) carbamate</td><td>n.d.</td><td>n.d.</td><td>n.d.</td><td>0.007
(0.8)</td><td>n.d.</td></tr>
<tr><td>500M45</td><td>Methyl 2{[1-(4-chloro 3 hydroxy phenyl) -1H-pyrazol-3-yl] oxy}methyl) phenylcarbamate</td><td>0.001
(1.1)</td><td>n.d.</td><td>n.d.</td><td>n.d.</td><td>n.d.</td></tr>
<tr><td>500M51</td><td>2-[(metoxycarbonyl) amino]benzoic acid</td><td>n.d.</td><td>n.d.</td><td>n.d.</td><td>n.d.</td><td>0.039
(12.4)</td></tr>
<tr><td>500M66</td><td>{2-[1-(3 chloro4-hydroxyphenyl) 1H-pyrazol-3-yl oxymethyl]- phenyl) carbamic acid methyl ester</td><td>n.d.</td><td>n.d.</td><td>n.d.</td><td>0.021
(2.5)</td><td>n.d.</td></tr>
<tr><td>500M67</td><td>{2-[1-(4 chloro 2-hydroxyphenyl) 1H-pyrazol-3-yl oxymethyl] - phenyl) carbamic acid methyl ester</td><td>0.004
(2.8)</td><td>n.d.</td><td>n.d.</td><td>0.024
(2.8)</td><td>0.025
(7.8)</td></tr>
</table>

n.d.: not detected

Pyraclostrobin was the main residue in nearly all samples. In muscle and fat, pyraclostrobin and the demethoxy metabolite 500M07 were the only compounds detected. In milk, liver and kidney, the situation was more complex. In milk, metabolites derived by cleavage (500M04, 500M05 and 500M85) were prominent besides pyraclostrobin. In liver and kidney, hydroxylation at various positions of the ring systems led to the metabolites 500M08, 500M39, 500M45, 500M64, 500M66 and 500M67. In liver, cleavage was less pronounced, but the cleavage products 500M05 and 500M51 were found in kidney.

The unextractable residues in liver and kidney (high dose) were further characterized by pronase treatment and acid hydrolysis (Table 13).

More than 30% of the TRR in liver was released by pronase digestion, and about 10% and 30% of the chlorophenyl- and tolyl-labelled TRR in kidney was released by enzyme incubation. HPLC analysis of the digests showed that the residues released consisted of several metabolites, each significantly below 10% of the TRR.

Generally, more radioactivity was released by refluxing with hydrochloric acid. By applying this harsh treatment, most of the unextractable residue from the chlorophenyl label was cleaved and converted to chlorinated pyrazole derivatives.

Table 13. Solubilization of the residual radioactive residue in goat liver and kidney after dosing with [^{14}C]pyraclostrobin (50 mg/kg feed).

Sample	Released radioactivity, mg/kg and (% of TRR)	
	Pronase treatment	Acid hydrolysis
Chlorophenyl label		
Liver	0.504 (33.5)	0.915 (60.8)
Kidney	0.041 (12.2)	0.057 (17.2)
Tolyl label		
Liver	0.446 (53.9)	0.506 (61.0)
Kidney	0.102 (32.4)	0.105 (33.2)

A comparison of the extractability and the HPLC metabolite profiles indicated that there was no noticeable change in the nature of the radioactive residues after storage for more than one year.

Laying hens. The metabolism and distribution of [^{14}C]pyraclostrobin in laying hens was investigated Leibold. *et al*. (1998b)and Hafemann and Knoell (1999) following USEPA Residue Chemistry Test Guidelines, OPPTS 860.1300. The test compounds were given by repeated oral administration on seven consecutive days to two groups of hens at dose levels of 12 mg/kg feed and 13 mg/kg feed respectively. The dose levels corresponded to 0.70 mg/kg body weight (chlorophenyl label) and 0.88 mg/kg body weight (tolyl label).

The recoveries accounted in total for 101.17% of the dose for the chlorophenyl label and 95.49% of the dose for the tolyl label (Table 14). With both labels, 0.05% of the dose was found in eggs and 0.19% in organs and tissues. 93% of the dose of the chlorophenyl label and 87% of the tolyl label was determined in the excreta. About 8% and 9% of the dose was recovered in the gastrointestinal tract and cage wash from the chlorophenyl label and the tolyl label respectively.

Table 14. Recovery of ^{14}C after administration of [^{14}C]pyraclostrobin to laying hens, % of total dose.

Sample	**Chlorophenyl label (group A)**	**Tolyl label (group B)**
Eggs	0.05	0.05
Organs and tissues	0.19	0.19
Excreta	93.30	86.59
GIT, Cage wash	7.63	8.66
Total	101.17	95.49

The total radioactive residues were determined in eggs, muscle, fat and liver (Table 15). Muscle contained less than 0.01 mg/kg and eggs about 0.03 mg/kg with both labels. Higher residue levels were measured in liver with 0.317 mg/kg for the chlorophenyl label and 0.474 mg/kg for the tolyl label.

Table 15. Total radioactive residues in edible fractions after dosing laying hens with [^{14}C]pyraclostrobin (nominal dose 12 ppm based on feed intake).

Sample	Group A chlorophenyl label, mg/kg	Group B tolyl label, mg/kg
Eggs	0.026	0.031
Muscle	0.007	0.009
Fat	0.083	0.065
Liver	0.317	0.474

Eggs and edible tissues except muscle, which showed residues below 0.01 mg/kg, were further processed to identify metabolites. Eggs and liver from both groups were first extracted with acetonitrile, and fat with a mixture of acetonitrile and n-hexane. Fat and liver were then extracted with water. The aqueous extracts were all below 10% of the TRR and below 0.05 mg/kg. The acetonitrile extracts of liver and eggs were partitioned with n-hexane. The extractability of all samples by organic solvents is shown in Table 16.

The unextractable liver residues from both labels were treated by pronase. 15.1% of the TRR (0.048 mg/kg) and 20.7% of the TRR (0.098 mg/kg) were solubilized from the chlorophenyl label and the tolyl label respectively. Further purification of the released fraction by partition chromatography preceded HPLC analysis.

Table 16. Extractability of residues from eggs and tissues of laying hens after dosing with [^{14}C]pyraclostrobin at 12 mg/kg (nominal dose).

Sample	Organosoluble extract		Unextractable residue	
	mg/kg	% of TRR	mg/kg	% ofTRR
	Group A (Chlorophenyl label)			
Eggs	0.017	66.2	0.010	38.5
Fat	0.079	96.1	0.002	1.8
Liver	0.136	42.8	0.136	42.7
	Group B (Tolyl label)			
Eggs	0.017	54.0	0.014	46.0
Fat	0.058	90.3	0.002	2.8
Liver	0.218	46.0	0.225	47.5

The acetonitrile phases from eggs, fat and liver were analysed by HPLC. The identified compounds are shown in Table 17 and Table 18. Excreta were also extracted and analysed by HPLC for subsequent isolation and identification of metabolites as reference substances for co-chromatography with extracts of the edible tissues that showed much lower residue levels. Metabolites in excreta were all identified by mass spectrometry. The chemical structures of metabolites 500M64, 500M66 and 500M77 were confirmed by NMR.

The major metabolite in liver was the glucuronic acid conjugate 500M32 bound to the tolyl ring of the demethoxylated parent structure. It accounted for 10.9% of the TRR or 0.035 mg/kg of the chlorophenyl label and 13.1% of the TRR or 0.062 mg/kg of the tolyl label. Fat contained as the major residues the parent compound, 500M07 and 500M64. The parent accounted for 10.2% of the TRR or 0.008 mg/kg of the chlorophenyl label and 15.2% of the TRR or 0.010 mg/kg of the tolyl label, and 500M07 for 27.3% of the TRR or 0.022 mg/kg of the chlorophenyl label and 38.9% of the TRR or 0.025 mg/kg of the tolyl label.

The very low identified residues in eggs mainly consisted of the parent and its demethoxylated derivative 500M07, accounting for 8.8% of the TRR or 0.002 mg/kg and 11.2% of the TRR or 0.003 mg/kg respectively of the chlorophenyl label. In the case of the tolyl label, the parent and metabolite 500M07 accounted for 8.5% and 8.3% of the TRR (0.003 mg/kg) respectively. The other metabolites identified by mass spectrometry were detected in edible tissues at levels from <0.0005 mg/kg up to 0.036 mg/kg, mainly less than 5% of the TRR.

Table 17. Identified compounds in eggs and tissues of laying hens after dosing with [^{14}C]pyraclostrobin (chlorophenyl label, nominal dose 12 mg/kg based on feed intake).

Compound	Chemical name	Liver mg/kg (% of TRR)	Fat mg/kg (% of TRR)	Eggs mg/kg (% of TRR)
BAS 500 F	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) N methoxy carbamate	n.d.	0.008 (10.2)	0.002 (8.8)
500M04	1-(4-chlorophenyl) -1H-pyrazol-3-ol	0.004	0.002	0.001

Compound	Chemical name	Liver mg/kg (% of TRR)	Fat mg/kg (% of TRR)	Eggs mg/kg (% of TRR)
		(1.4)	(2.7)	(3.1)
500M06	1-(4-chlorophenyl) -3-({2 [(methoxy carbonyl) amino] benzyl} oxy)-1H-pyrazol-3-yl] glucopyranosiduronic acid	0.013 (4.1)	n.d.	n.d.
500M07	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl]oxymethyl} phenyl) carbamate	n.d.	0.022 (27.3)	0.003 (11.2)
500M32	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl]oxymethyl}-(glucopyranu ronosyl oxy) phenyl) carbamate	0.035 (10.9)	n.d.	n.d.
500M39	Hydroxylated methyl N-(2{[1-(4-chloro phenyl)-1H-pyrazol-3-yl]oxymethyl} hydroxyphenyl) carbamate	0.003 (1.0)	n.d.	n.d.
500M64	{2-[1-(4-chlorophenyl) 1H-pyrazol-3-yl oxymethyl] 4 hydroxy- phenyl) carbamic acid methyl ester	0.009 (2.8)	0.009 (10.8)	0.001 (2.6)
500M66	{2-[1-(3chloro4-hydroxyphenyl) 1H-pyrazol-3-yl oxymethyl]- phenyl) carbamic acid methyl ester	0.012 (3.8)	n.d.	n.d.
500M77	MethylN-(2{[1-(3-chloro 4 hydroxyphenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) N methoxy carbamate	0.006 (1.8)	0.001 (1.8)	n.d.
500M83	Methyl N-(2{[1-[4-(glucopyranuronosoyl-oxy) phenyl] -1H-pyrazol-3-yl] oxymethyl} phenyl) carbamate	0.014 (4.5)	n.d.	n.d.

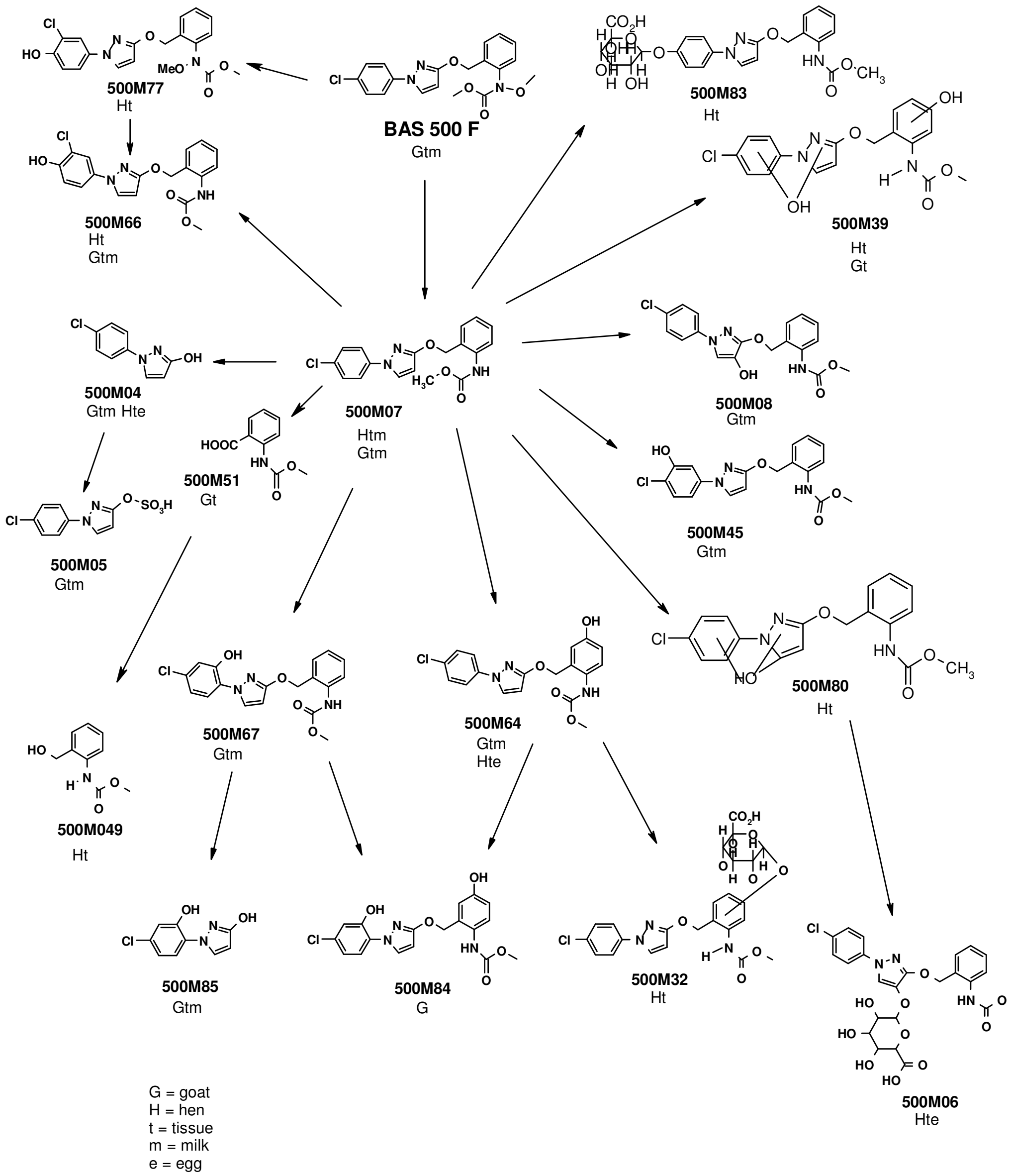
Table 18. Identified compounds in eggs and tissues of laying hens after dosing with [^{14}C]pyraclostrobin (tolyl label, nominal dose 12 mg/kg based on feed intake).

Compound	Chemical name	Liver mg/kg (% of TRR)	Fat mg/kg (% ofTRR)	Eggs mg/kg (% of TRR)
pyraclostrobin	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) N methoxy carbamate	-	0.010 (15.2)	0.003 (8.5)
500M06	1-(4-chlorophenyl) -3-({2 [(methoxy carbonyl) amino] benzyl} oxy)-1H-pyrazol-3-yl] glucopyranosiduronic acid	0.024 (5.0)	-	0.001 (2.6)
500M07	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) carbamate	-	0.025 (38.9)	0.003 (8.3)
500M32	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl}- - (glucopyranuronosyl oxy) phenyl) carbamate	0.062 (13.1)	-	-
500M39	Hydroxylated methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} hydroxyphenyl) carbamate	0.002 (0.4)	n.d.	0.0005 (1.3)
500M49	(2-hydroxymethyl- phenyl)-carbamic acid methyl ester	0.036 (7.5)	0.001 (1.7)	0.0002 (0.7)
500M64	{2-[1-(4-chlorophenyl) 1H-pyrazol-3-yl oxy methyl]4 hydroxy- phenyl) carbamic acid methyl ester	0.034 (7.3)	0.005 (7.8)	0.0006 (1.9)
500M66	{2-[1-(3 chloro4-hydroxyphenyl) 1H-pyrazol-3-yl oxymethyl]- phenyl) carbamic acid methyl ester	0.009 (1.9)	n.d.	n.d.
500M77	Methyl N-(2{[1-(3-chloro 4 hydroxyphenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) N methoxy carbamate	0.009 (1.9)	0.001 (2.3)	<0.0001 (0.2)
500M80	Methyl N-(2{[1-(4-chloro ? hydroxy phenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) N methoxy carbamate	0.003 (0.6)	n.d.	n.d.
500M83	Methyl N-(2{[1-[4-(glucopyranuronosoyl oxy) phenyl] -1H-pyrazol-3-yl] oxymethyl}phenyl) carbamate	0.021 (4.2)	n.d.	n.d.

Five routes of biotransformation were identified. The predominant initial transformation is demethoxylation. The demethoxylated metabolite is hydroxylated at various positions on the three rings and hydroxylation is followed by conjugation with glucuronic acid. The parent compound is itself hydroxylated on the chlorophenyl ring in the para position so that the Cl atom is shifted to the meta position (NIH-shift). The parent compound is also cleaved at the methylene ether bridge, and there is substitution of the Cl atom by glucuronic acid.

Tissues and eggs of hens that received an exaggerated dose of 12-13 mg/kg feed contained residues at low levels consisting of three major metabolites. The parent compound was found in fat and eggs but not in liver. It is very unlikely that any of these compounds will be found in quantifiable amounts when hens are fed with feed containing residues from normal agricultural practice.

Figure 1. Metabolic pathways of [14C]pyraclostrobin in goats and hens.



Plant metabolism

Studies on grapes, potatoes and wheat using [tolyl-U-^{14}C]pyraclostrobin and [chlorophenyl-U-^{14}C]pyraclostrobin were reported.

Grapes. Hamm (1998) applied [^{14}C]pyraclostrobin (tolyl and chlorophenyl labels) 6 times as an EC formulation to Mueller-Thurgau vines at a rate of 250 g ai/ha (total 1500 g ai/ha) during the vegetation period. The first application was at growth stage 53-55 (inflorescences visible to fully developed) and was repeated 5 times approximately every 16 to 19 days thereafter. The last application was at growth stage 81 (beginning of ripening), 40 days before harvest.

Grape and leaf samples were extracted with methanol, and the residue in grapes further extracted with ammonia or water. The extractable radioactive residues were quantified by radio HPLC, characterised by liquid/liquid partitioning using cyclohexane and ethyl acetate, and identified by comparison with reference substances. Where possible, compounds were isolated by HPLC and their structures elucidated by LC/MS/MS.

For information on the storage stability of the grape samples, the only relevant raw agricultural commodity, the extractability and HPLC profiles were investigated at the beginning and end of the study.

The TRR determined by combustion analyses were 1.559 mg/kg and 0.951 mg/kg in grapes and 39.244 and 40.029 mg/kg in leaves for tolyl and chlorophenyl labelled samples respectively. In grape samples, 84 to 88% of the TRR was extractable with methanol. The extraction behaviour is summarised in Table 19.

Table 19. Extraction of radioactivity after treatment of grapes with [^{14}C]pyraclostrobin.

Solvent	Tolyl label mg/kg and (% of TRR)	Chlorophenyl label mg/kg and (% of TRR)
Methanol	1.314 (84.3)	0.835(87.8)
Residue	0.245 (15.7)	
Water		0.006(0.6)
Ammonia	0.023 (1.5)	
Final residue	0.261(16.7)	0.116(12.2)

In grapes, pyraclostrobin is metabolized by three main routes: (1) demethoxylation of the methoxycarbamate, (2) hydroxylation of the tolyl and the chlorophenyl ring systems followed by glucosylation or methylation, and (3) cleavage between the ring systems and subsequent conjugation of the resulting intermediates with glucose.

The quantification of the identified compounds is shown in Table 20.

Table 20. Identified components in grape samples after treatment with [^{14}C]pyraclostrobin.

Compound	Chemical name	Tolyl label	Chlorophenyl label
		mg/kg (% of TRR)	
pyraclostrobin (304 428)	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) N methoxy carbamate	0.860 (55.7)	0.688 (66.1)
500M07 (304 428) (240 266)	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) carbamate	0.170 (11.2)	0.159 (15.3)
500M54	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl}- -methoxyphenyl) carbamate	0.045 (2.9)	0.011 (1.1)

Compound	Chemical name	Tolyl label	Chlorophenyl label
		mg/kg (% of TRR)	
500M55 (n.a.)	1-(4-chlorophenyl) -1H-pyrazol-3-yl] 4-O-(6- deoxy_mannopyranosyl)-xylo-glucopyranoside-	n.d.	0.029 (2.7)
500M56 (n.a.)	Methyl 2({[1-(4-chlorophenyl) -4(glucopyranosyloxy)-1H-pyrazol-3-yl] oxy}methyl}- - methoxy phenyl carbamate	0.048 (3.11)	0.016 (1.5)

n.a. not applicable
n.d.: not detected

A comparison of the extractability and the HPLC patterns showed that there was no noticeable change in the nature of the radioactive residues during sample storage over a period of more than 6 months.

The metabolic pathways of pyraclostrobin in grapes are shown in Figure 2. The investigation of the metabolism of pyraclostrobin in grapes using material labelled in either the tolyl or the chlorophenyl ring leads to the conclusion that the relevant residue in grapes consists of pyraclostrobin and its demethoxy metabolite 500M07. Some other compounds identified as products formed by cleavage of the molecule, O-glucosylation or methoxylation were of minor importance because their respective levels were far below 10% of the TRR.

Potatoes. Bross (1999) applied [14C]pyraclostrobin (tolyl and chlorophenyl labels) as an EC formulation 6 times to potato plants (variety Quarta) at an intended rate of 300 g ai/ha. The first application was about 8 weeks after sowing at growth stage 31 (main stem elongation), and was repeated 5 times approximately every 9 days thereafter. The plants were grown in pots filled with Limburgerhof sand type soil under natural conditions. Samples taken for analysis seven days after the third application and at full maturity (seven days after last application) were separated into green matter, tubers and roots.

Green matter and tuber samples were extracted with methanol, and the residue in tubers (tolyl label) that was not extractable with methanol was further extracted with ammonia. Quantification and identification of residues were carried out as above for grapes, and the stability of residues in stored samples was similarly examined. The results are shown in Tables 21-24.

Table 21. Total radioactive residues (mg/kg as pyraclostrobin) after treatment of potatoes with [^{14}C]pyraclostrobin.

Sample	Tolyl label	Chlorophenyl label
Green matter[1]	9.860	19.636
Tuber[1]	0.014	0.009
Roots[1]	0.208[2]	0.450[2]
Green matter	47.785	69.846
Tuber	0.048	0.036
Roots	0.678[2]	0.986[2]

[1] harvested after three applications
[2] determined by direct combustion analysis

In the green matter samples, 91 to 95% of the TRR was extracted with methanol. In tubers, 49% and 62% of the TRR could be extracted by methanol from those treated with the chlorophenyl label, but only 39% and 42% from those treated with the tolyl label. Ammonia extraction of the latter removed about half of the unextractable residue (Table 22).

Table 22. Extraction of radioactivity, mg/kg as pyraclostrobin and (% of TRR) after treatment of potatoes with [^{14}C]pyraclostrobin.

Sample	Green matter*	Tuber*	Green matter	Tuber
Tolyl label				
Methanolic extracts	9.34 (94.7)	0.006 (39.1)	45.2 (94.6)	0.020 (41.6)
Residue	n.a.	n.a.	n.a.	0.025 (51.8)
Ammonia extract	n.a.	n.a.	n.a.	0.012 (23.4)
Unextracted residue	0.523 (5.3)	0.009 (61.0)	2.6 (5.4)	0.019 (38.5)
Chlorophenyl label				
Methanolic extracts	18.53 (94.4)	0.005 (48.7)	63.41 (90.8)	0.022(61.9)
Aqueous extracts	n.a.	n.a.	n.a.	0.001 (5.6)
Final residue	1.105(5.6)	0.005(51.3)	6.43(9.2)	0.012(32.6)

* harvested after three applications n.a. not applicable

Metabolism in potatoes is essentially as in grapes, but after cleavage between the ring systems formation of the natural amino acid tryptophan was observed in tubers. The formation of tryptophan and its subsequent incorporation into the protein structures of the tubers is an explanation for the different extraction behaviour of green matter and tubers.

The quantification of the identified compounds is shown in Tables 23 and 24.

Table 23. Identified compounds in potato samples after treatment with [tolyl-^{14}C]pyraclostrobin.

Compound	Chemical name	Green matter		Tuber	
		GS 70	GS 85-89	GS 70	GS 85-89
		mg/kg (% of TRR)			
pyraclostrobin (304 428)	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) N methoxy carbamate	6.427 (65.2)	30.888 (64.6)	0.000 (2.5)	n.d.
500M54	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl }- -methoxyphenyl) carbamate	0.177 (1.8)	n.d.	n.d.	n.d.
500M68	Glucopyranosyloxylated Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) N methoxy carbamate	0.058 (0.6)	n.d.	n.d.	n.d.
500M07 (340 266)	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) carbamate	1.600 (6.2)	10.231 (21.4)	0.000 (0.6)	n.d.
500M72 (L tryptophan)		n.d.	n.d.	0.001 (10.0)	0.014 (29.2)

GS: Growth stage
n.d.: not detected

Table 24. Identified compounds in potato samples after treatment with [chlorophenyl-^{14}C]pyraclostrobin.

<table>
<tr><th rowspan="3">Compound</th><th rowspan="3">Metabolite identity</th><th colspan="2">Green matter</th><th colspan="2">Tuber</th></tr>
<tr><th>GS 70</th><th>GS 85-89</th><th>GS 70</th><th>GS 85-89</th></tr>
<tr><th colspan="4">mg/kg
(% of TRR)</th></tr>
<tr><td>pyraclostrobin
(304 428)</td><td>Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) N methoxy carbamate</td><td>11.098
(56.6)</td><td>38.515
(55.1)</td><td>0.002
(21.0)</td><td>0.012
(29.4)</td></tr>
<tr><td>500M04
(298 327)</td><td>1-(4-chlorophenyl) -1H-pyrazol-3-yl glucopyranosiduronic acid</td><td rowspan="2">0.570
(2.9)</td><td rowspan="2">3.068
(4.4)</td><td rowspan="2">0.000
(1.5)</td><td rowspan="2">0.001
(1.7)</td></tr>
<tr><td>500M68
(n.a.)</td><td>Glucopyranosyloxylated Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) N methoxy carbamate</td></tr>
<tr><td>500M07
(340 266)</td><td>Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) carbamate</td><td>3.157
(16.1)</td><td>14.502
(20.8)</td><td>0.001
(5.8)</td><td>0.003
(6.6)</td></tr>
<tr><td>500M54
(n.a.)</td><td>Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl }- -methoxyphenyl) carbamate</td><td>0.271
(1.4)</td><td>1.782
(2.6)</td><td>0.001
(6.2)</td><td>0.001
(2.6)</td></tr>
<tr><td>500M79
(n.a.)</td><td>1-(4-chlorophenyl) -1H-pyrazol-3-yl glucopyranoside</td><td>0.072
(0.4)</td><td>0.072
(0.1)</td><td>0.000
(0.4)</td><td>0.001
(3.3)</td></tr>
</table>

GS Growth stage
n.a. not applicable
n.d. not detected

A comparison of the extractability and the HPLC patterns showed that there was no noticeable change in the nature of radioactive residues during sample storage over a period of more than 2 years. The metabolic pathways of pyraclostrobin in potatoes are shown in Figure 2. As in grapes, the relevant residue in potato forage and tubers consists of pyraclostrobin and its demethoxy metabolite 500M07. The total residues in the edible potato tubers are very low.

Wheat. Reinhard (1999) planted Summer wheat plants at growth stage GS 31-32 (BBCH scale) from an outdoor test site in plastic pots which were kept under natural climatic conditions in a glass-roofed vegetation hall. The plants were separately treated twice (interval 24 days) with EC formulations of [chlorophenyl-U-^{14}C]pyraclostrobin and [tolyl-U-^{14}C]pyraclostrobin at 300 g ai/ha (1.2 times the recommended rate). The first application was at growth stage GS 32 (BBCH scale) and the second at GS 61.

Wheat samples were collected 0, 31 and 41 days after the last treatment. The harvest samples (41 days) were separated into straw, grain and chaff. Forage (31 days), straw and grain represent the raw agricultural commodities and were therefore analysed in detail. The samples with both labels were sequentially extracted with methanol and water. The unextractable radioactive residue was analysed by combustion. The total radioactive residues were calculated as the sum of extractable and unextractable radioactivity, and separated into organosoluble and water-soluble fractions by partition between cyclohexane and water followed by ethyl acetate and water. For a more detailed analysis, the extractable radioactivity was characterized and quantified by radio-HPLC. Identification was by comparison with reference substances or where possible by LC/MS/MS after isolation by HPLC. For characterization of the unextractable radioactive material, the residue after methanolic and water extraction was first treated with ammonia to release radioactivity associated with grain protein under mild conditions. Grain protein (tolyl label) that was precipitated from the ammonia extract after acidification was further treated with a protease and the resulting amino acid solution analysed by HPLC. The grain residue after ammonia extraction was subjected to DMSO/water treatment to isolate starch. The residues from forage and straw were examined for radioactivity associated with cellulose and lignin by cellulase treatment for cellulose, refluxing with 10% NaOH for separation of cellulose and lignin, and treatment with H_2SO_4 for lignin.

The TRR from the two labels was almost identical except in grain. In forage after 31 days the TRR amounted to 6.5 and 6.8 mg/kg. Considerably higher levels were observed in straw (41 days), at 37.8 to 40.5 mg/kg. In chaff, consisting of the glumes that surround the grain during ripening, the TRR levels were 24.25 and 30.6 mg/kg. By far the lowest TRR was in grain, varying between 0.098 mg/kg in the chlorophenyl-labelled and 0.441 mg/kg in the tolyl-labelled samples. The difference by a factor of 4.5 originates from the cleavage of the test substance and the subsequent incorporation of one of the fragments.

The extraction of forage and straw with methanol followed by water released about 85% of the TRR, with no significant difference between the labels. Extraction of radioactivity from grain was less effective, ranging from 51% (tolyl label) to 71% (chlorophenyl label), with 25.6% and55.8% extracted with methanol 25.6% and 15.2% with water. The results are shown in Table 25.

Except for grain with the tolyl label, most of the extractable radioactivity was organosoluble when partitioned between water/cyclohexane and water/ethyl acetate.

Table 25. Extraction of radioactivity after treatment of wheat with [14C]pyraclostrobin.

Sample	TRR mg/kg	MeOH mg/kg (% of TRR)	H_2O mg/kg (% of TRR)	Total extracted, mg/kg (% of TRR)	Unextracted, mg/kg (% of TRR)
Chlorophenyl label					
Forage	6.527	5.282(80.9)	0.274(4.2)	5.556(85.1)	0.970(14.9)
Straw	37.768	28.191(74.6)	3.755(9.9)	31.946(84.5)	5.822(15.4)
Grain	0.098	0.055(55.8)	0.015(15.2)	0.070(71.0)	0.028(29.0)
Chaff	24.251	13.257(54.7)	3.421(14.1)	16.678(68.8)	7.573(31.2)
Tolyl label					
Forage	6.793	5.436(80.0)	0.281(4.1)	5.717(84.1)	1.076(15.8)
Straw	40.461	31.777(78.5)	2.915(7.2)	34.692(85.7)	5.769(14.3)
Grain	0.441	0.113(25.6)	0.113(25.6)	0.226(51.2)	0.216(48.8)
Chaff	30.617	18.183(59.4)	3.639(11.9)	21.822(71.3)	8.795(28.7)

In forage and straw, the metabolite patterns were almost identical with unchanged pyraclostrobin the most prominent compound (53–58% of the TRR). In grain, pyraclostrobin represented 8 and 36% of the TRR in the tolyl and the chlorophenyl labelled samples. The main metabolite was 500M07 (500-3), with a ratio to pyraclostrobin of 1:4 in forage and straw and 1:3 in grain. To a small extent, pyraclostrobin and/or 500M07 were hydroxylated in the three rings. Some of the hydroxy compounds were conjugated with glucose or methylated. Mainly in grain, an additional degradation route was oxidative cleavage at the ether bridge and subsequent transformation of the tolyl fragment 500M24 to the natural amino acid L-tryptophan (23% of the TRR) via the shikimate pathway. The pyraclostrobin isomer 500M76 occurred in small amounts, evidently formed under the influence of light.

Storage stability investigations demonstrated that the metabolite patterns did not change significantly during the experimental period of about 20 months.

Table 26. Metabolites identified after treatment of wheat with [^{14}C]pyraclostrobin

Compound	Chemical name	Forage (31 days) mg/kg and (% of TRR)	Straw mg/kg and (% of TRR)	Grain mg/kg and (% of TRR)
pyraclostrobin	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) N methoxy carbamate	Chlorophenyl label		
		3.724(57.0)	21.155(56.0)	0.036(36.1)
		Tolyl label		
		3.598(52.9)	23.295(57.5)	0.034(7.8)
500M07	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl) carbamate	Chlorophenyl label		
		0.782(12.0)	4.885(12.9)	0.010(10.5)
		Tolyl label		
		0.892(13.1)	6.159(15.2)	0.014(3.2)
500M54	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl}- - methoxy phenyl) carbamate	Chlorophenyl label		
		0.136(2.1)	0.462(1.2)	n.d.
		Tolyl label		
		0.260(3.8)	0.617(1.6)	n.d.
500M76	Methyl N-{2[2-(4-chlorophenyl) -5 oxo-2,5-dihydro-pyrazol-1-yl methyl] N -methoxy carbamate	Chlorophenyl label		
		0.052(0.8)	0.439(1.2)	<0.004
		Tolyl label		
		0.054(0.8)	0.607(1.5)	n.d.
500M34	Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxy}methyl} - - hydroxyphenyl) carbamate	Chlorophenyl label		
		n.d.	0.462(1.3)	n.d.
		Tolyl label		
		0.083(1.2)	0.289(0.7)	n.d.
500M68	glucopyranosyloxylated Methyl N-(2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxymethyl} phenyl N -methoxy carbamate	Sum of glucosides (500M68, 500M70, 500M71)		
500M70	glucopyranosyloxylated Methyl 2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxy}methyl} - - phenylcarbamate	Chlorophenyl label		
		0.163(2.5)	1.640(4.3)	<0.004 <4.3
		Tolyl label		
		0.170(2.5)	1.619(4.0)	n.d.
500M71	Methyl 2{[1-(4-chlorophenyl) -1H-pyrazol-3-yl] oxy}methyl} - -glucopyranosyloxyl phenylcarbamate			
500M72	(L-Tryptophan)	Tolyl label		
		not detected		0.101(23.0)
500M24	2-[methoxy1 methoxycarbonyl)amino benzois acid	Tolyl label		
		not detected		0.030(6.7)
500M04	1-(4-chlorophenyl) -1H-pyrazol-3-ol	Chlorophenyl label		
		0.111	0.415	<0.004
		(1.7)	(1.1)	(<4.3)

The unextractable residues accounted for about 15% of the TRR in forage and straw and up to 49% in grain, so they were characterized in detail.

In forage and straw, extraction with ammonia released about 3% of the TRR. The residue after ammonia extraction was further analysed for radioactivity associated with cellulose and lignin. Cellulose in forage and straw ranged from 1.0 to 2.6% of the TRR and lignin from 4.4 – 7.9%, giving a total for cellulose and lignin of about 40% - 50% of the unextractable radioactive residue. About a further 14 – 20% was extractable with ammonia, and the remainder of about 30 – 40% RRR could be characterized as alkali-soluble radioactivity that did not precipitate with HCl. This fraction may contain hemicelluloses or fragments of a lignin-polysaccharide complex that could not be classified by the methods used.

Table 27. Fractionation of unextractable radioactivity from wheat forage and straw.

Fraction	Forage		Straw	
	Cl-phenyl label mg/kg(%TRR)	Tolyl label mg/kg(%TRR)	Cl-phenyl label mg/kg(%TRR)	Tolyl label mg/kg(%TRR)
RRR[1]	0.885 (15.4)	1.111(17.9)	8.449(18.0)	8.777(19.7)
Ammonia extract of RRR	0.173(3.0) = 19.5% RRR	0.159(2.6) = 14.3% RRR	1.582(3.4) = 18.7% RRR	1.261(2.8) = 14.4% RRR
Residue after ammonia extraction	0.712(12.4)	0.952(15.3)	6.867(14.6)	7.516(16.9)
Cellulose	0.103(1.8) = 11.6% RRR	0.112(1.8) = 10.1% RRR	0.470(1.0) = 5.6% RRR	1.157(2.6) = 13.2% RRR
Lignin	0.252(4.4) = 28.5% RRR	0.423(6.8) = 38.1% RRR	3.197(6.8) = 37.8% RRR	3.514(7.9) = 40.0% RRR
Alkali-solubles not precipitating with HCl	0.306(5.3) = 34.5% RRR	0.373(6.0) = 33.6% RRR	3.137(6.7) = 37.1% RRR	2.327(5.4) = 26.5% RRR

[1] RRR: Residual (unextractable) radioactive residue

In grain, there was a ratio of about 8:1 in the absolute amounts of unextractable activity from the tolyl and chlorophenyl labels, pointing to the cleavage of the test substance and a different metabolic fate of the fragments.

The extractable radioactive fragments of pyraclostrobin in tolyl-labelled grain were 500M24 and tryptophan. Additional amounts (about 7% of the TRR) of these metabolites were released from the unextractable fraction by ammonia, but more of the ammonia-extractable radioactivity (about 11% of the TRR) was incorporated into grain protein as [14C]tryptophan. This was shown by chromatography of the protease-treated protein pellet.

The radioactivity in the residue after ammonia extraction (22% of the TRR) could roughly be classified into portions associated with starch, cellulose and alkali-soluble material, e.g. hemicelluloses.

The unextractables in chlorophenyl-labelled grain accounted for only 0.027 mg/kg (33.7% of the TRR). About 2/3 of this was found to be ammonia-soluble or associated with starch.

Table 28. Fractionation of unextractable radioactivity from wheat grain.

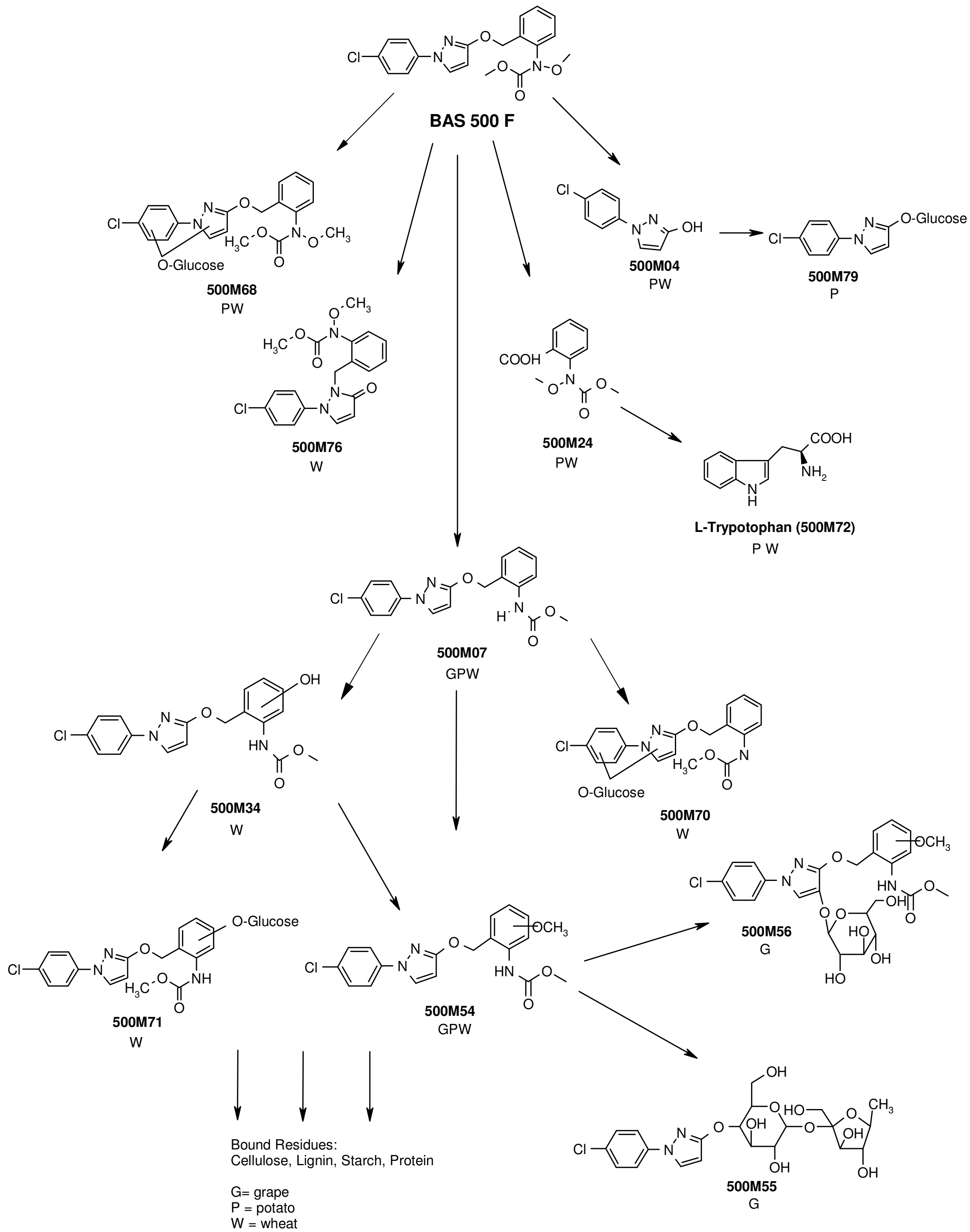
Fraction	Grain	
	Cl-phenyl label mg/kg (%TRR)	Tolyl label mg/kg (%TRR)
RRR[1]	0.027(33.7)	0.216(48.8)
Ammonia extract of RRR	0.009(11.3)	0.113(25.5)
Amino acid fraction after pronase treatment of the precipitated protein	n. d.	0.047 (10.7)
Supernatant from protein precipitation	n. d.	0.089 (20.1)
Residue after ammonia extraction	0.018 (22.4)	0.098(22.1)
Starch precipitate from the DMSO /	0.009	0.022

Fraction	Grain	
	Cl-phenyl label mg/kg (%TRR)	Tolyl label mg/kg (%TRR)
water extract	(10.5)	(5.0)
Supernatant of starch precipitation from the DMSO / water extract	0.004 (5.1)	0.012 (2.7)
Residue after DMSO / water extraction	0.008 (9.9)	0.065 (14.9)
Hot water extract of the DMSO / water residue	n. d.	0.015 (3.4)
NaOH extract of the residue after hot water extraction	n. d.	0.043 (9.8)
Residue after NaOH extraction (cellulose)	n. d.	0.022 (5.0)

[1] RRR: Residual (unextractable) radioactive residue
n. d.: not determined

The relevant residue of [^{14}C]pyraclostrobin in wheat consists of the unchanged parent compound and its demethoxy metabolite 500M07. Tryptophan, that is formed in considerable amounts from pyraclostrobin in grain, is a natural component and therefore of no toxicological concern. All other metabolites identified are clearly below 10% of the TRR and thus of minor importance. The low unextractable residues in forage and straw demonstrate that pyraclostrobin and its metabolites are not generally firmly associated with cell wall polymers. Somewhat higher amounts of unextractables were found in grain since some of the radioactivity was incorporated into or associated with grain protein and starch.

Figure 2. Metabolic pathways of pyraclostrobin in plants.



Environmental fate in soil and water/sediment systems

Aerobic degradation

Ebert (1998, 1999a) applied chlorophenyl- and tolyl-labelled pyraclostrobin to a loamy sand soil at the maximum single application rate of 250 g ai/ha. The soil characteristics are summarised in table 29. The incubations were in the dark, 20°C, at 40% maximum water holding capacity. A system with continuous aeration and trapping of volatile compounds was used. Soil was sampled at intervals of 0, 1, 3, 7, 14, 33, 60, 87, 180, 270 and 360 days.

Table 29. Soils used to investigate the degradation of pyraclostrobin (Ebert, 1998, 1999a).

Soil properties	tolyl label	chlorophenyl label
Textural class (German scheme)	loamy sand	loamy sand
Textural class (USDA scheme)	sandy loam	sandy loam
Origin	Limburgerhof, Germany	Limburgerhof, Germany
Particle size distribution [%] (German scheme):		
0.063 – 2 mm	62	66
0.002 – 0.063 mm	28	21
< 0.002 mm	10	13
Organic C [%]	1.8	2.0
pH [$CaCl_2$]	7.3	7.5

Pyraclostrobin was rapidly degraded, although it was still detectable at low levels after 360 days. Two dimeric products were identified: BF 500-6 which reached a maximum of 16% of the TAR after 180 days, and BF 500-7 which never exceeded 7% of the TAR.

In a further study (Ebert, 1999b) four different soils were treated with [tolyl-^{14}C]pyraclostrobin at a field application rate of 250 g ai/ha. The soil characteristics are given in Table 30. The incubation conditions were again aerobic, in the dark, at 20°C, 40% maximum water holding capacity. The soil extracts were analysed by radio-HPLC. Samples were taken at intervals of 0, 3, 7, 14, 34, 63, 92 and 120 days.

Table 30. Soils used to investigate the degradation of pyraclostrobin (Ebert, 1999b).

Soil properties	Lufa 2.2	Li35 b	US 771-15	Canadian soil
	96/736/04	96/145/03		
Textural class (German scheme)	loamy sand	loamy sand	n.d.	n.d.
Textural class (USDA scheme)	loamy sand	loamy sand	loamy sand	loam
Origin	Speyer, RP, Germany	Limburgerhof, RP, Germany	Holly Springs, NC, USA	Minto, Manitoba, Canada
Particle size distribution [%] (German scheme)				
0.063 – 2 mm	85	82	n.d.	n.d.
0.002 – 0.063 mm	10	10	n.d.	n.d.
< 0.002 mm	5	8	n.d.	n.d.
Organic C [%]	2.1	1.0	0.5	3.0
pH [$CaCl_2$]	5.4	6.5	5.6	7.7

n.d. not determined

The degradation products found in all four soils were the same as those identified in the metabolism studies and their levels were in the same range.

Soil photolysis

Photolytic degradation was studied by Scharf (1999d) using [^{14}C]pyraclostrobin, labelled in both positions at a rate corresponding to a field application rate of 250 g ai/ha. A xenon lamp with a light intensity of about 3 mW/cm^2 was used. Wavelengths below 290 nm were cut off to simulate natural sunlight. The duration of the experiment was 15 days with continuous irradiation.

In soil incubated at 40% maximum water-holding capacity (MWC) the products BF 500-6 and BF 500-7 were formed in trace amounts (maximum 2% of the TAR). The concentration of 500M07 increased from 2 to 6% of the TAR. The same products were formed in the dark control soil but at different levels. BF 500-6 and BF 500-7 reached maximum concentrations of 6.4% of the TAR (15 days), and 5% of the TAR (12 days) respectively. 500M07 was already present in the 0-day samples and its concentration did not change significantly (average about 2% of the TAR). The formation of bound residues was comparable with and without irradiation (average 12% of the TAR). The mineralization rate was generally low (maximum 2% of the TAR). A higher soil moisture of 80% MWC led to accelerated degradation of pyraclostrobin and therefore to accelerated formation of the known products.

Aerobic degradation (rate)

The test systems were as described in the studies by Ebert above. As well as the incubations in the degradation rate study (Ebert 1999b), the soil Lufa 2.2 was incubated at lower and higher temperatures (5°C, 30°C) and at a lower soil moisture (20% MWC).

The degradation rates are shown in Table 31. The half-lives for pyraclostrobin under standard incubation conditions (20°C, 40% MWC) were in the range of 12 – 101 days. Higher soil moisture generally accelerated degradation, but photolysis did not have a significant influence. At 5°C and under sterile conditions, almost no degradation took place, probably owing to reduced soil microbial activity under these conditions.

Table 31. DT_{50} and DT_{90} values for pyraclostrobin in laboratory soil studies.

Ref.	Label	Soil	Duration, days	Temp. [°C]	moisture [%MWC]	DT_{50} [days]	DT_{90} [days]
aerobic soil degradation							
Ebert,1998	tolyl	Bruch West	360	20	40	12	143
Ebert, 1999a	chlorophenyl	Bruch West	360	20	40	14	152
aerobic soil degradation (DT_{50}/DT_{90})							
Ebert, 1999b	tolyl	Lufa 2.2 Li35b US 771-15 Canadian	120 120 120 120	20 20 20 20	40 40 40 40	101 50 38 85	n.c. 163 n.c. n.c.
		Lufa 2.2 Lufa 2.2 (sterile)	120 120 120 129	20 5 30 20	20 40 40 40	137 n.c. 86 n.c.	n.c. n.c. n.c. n.c.
soil photolysis							
Scharf, 1999e irradiated	tolyl	Bruch West	15 15	22 22	40 80	42 9	n.c. n.c.
	chlorophenyl	Bruch West	15	22	40	32	n.c.
dark control	tolyl	Bruch West	15 15	22 22	40 80	41 10	n.c. n.c.
	chlorophenyl	Bruch West	15	22	40	22	n.c.

n.c.: not calculated (degradation time > twice study duration)

Two field soil dissipation studies (Kellner and Zangmeister, 1999a,b) were conducted using the formulated product BAS 500 01 F (Table 32).

Table 32. Field soil dissipation studies with pyraclostrobin.

Location	Soil type	Soil properties % organic C	pH	DT_{50} days
Germany	loamy sand	1.1	6.2	25
Germany	loamy silt	2.5	6.8	37
Germany	loamy sand	0.8	5.6	26
Spain	sandy loam/ loamy sand	0.6	7.6	8
Spain	sandy loam	0.9	7.6	2
Sweden	loamy sand	1.4	5.8	31

All trials show that pyraclostrobin is degraded rpidly, initially at very high rate. Pyraclostrobin does not show any tendency to move into deeper layers of the soil; it was only detected in the top 10 cm.

Adsorption and desorption

Adsorption and desorption of pyraclostrobin were measured by Ziegler (1998a), using a batch equilibrium procedure. The soil:water ratio was 1:5 and the temperature 22°C.

The results are shown in Table 33. The adsorption of pyraclostrobin in the investigated concentration range of 0.008 – 1.0 µg/ml can be described with a high degree of accuracy by the Freundlich equation. The adsorption constants K_d calculated from the Freundlich isotherms for the six test soils range from 30 to 368. K_{oc} values were 6000 – 16000. A subsequent determination of the desorption in two steps with 0.01 M $CaCl_2$ solution resulted in K_{desI}-values from 49 to 800 and in K_{desII} values from 51 to 681.

Table 33. Adsorption and desorption of [chlorophenyl-U-^{14}C] pyraclostrobin by soil.

Soil	Textural class, organic C %		Adsorption K_d [ml/g]	adsorption 1/n	adsorption K_{oc} [ml/g]	desorption K_{des} [ml/g]	
Germany	sand,	0.8	60	0.896	7500	87[1]	96[2]
Germany	loamy sand,	1.9	304	1.025	16000	160[1]	374[2]
Germany	sandy loam,	1.8	142	1.012	7889	136[1]	278[2]
USA	loamy sand,	0.5	30	0.861	6000	49[1]	51[2]
USA	sandy loam,	0.6	54	0.873	9000	97[1]	83[2]
Canada	sandy loam,	3.9	368	1.005	9436	800[1]	681[2]

[1] desorption step I
[2] desorption step II

Mobility

The leaching of labelled pyraclostrobin was studied by Ziegler (1998d) in sand, sand/loamy sand, silty sand/loamy sand and loamy sand (German scheme). 50 µg pyraclostrobin were incorporated into 100 g soil (corresponding to an application rate of 250 g active substance/ha) applied to the top of soil columns. The columns were eluted with 393 ml (= 200 mm rain) of 0.01 M aqueous calcium chloride solution. Four eluate fractions of about 100 ml each were collected during 2 days. The leachate fractions and individual soil segments were analysed for ^{14}C.

The results clearly showed that pyraclostrobin is not leached even under worst-case laboratory conditions. All radioactivity remained in the top two soil layers. None could be found in the leachates or in soil layers below 12 cm.

The leaching of aged pyraclostrobin soil residues was also studied (Ziegler, 1998c) in a German loamy sand. After ageing for 30 days at 20 ± 2°C at 40% water-holding capacity (WHC), the incubated soil was transferred to the top of a column containing untreated soil. Water was applied to simulate 200 mm rainfall (393 ml in two days). The leachate was collected in four fractions of about 100 ml and analysed for radioactive residues.

No radioactivity was found in the leachates. The top (0-6 cm) soil segments of the columns contained more than 87% of the total radioactive residues.

Hydrolysis

Pyraclostrobin was incubated in aqueous buffer solutions at 50°C at pH pH 4, 5, 7, and 9, and at 25°C at pH 5, 7 and 9 (Scharf, 1999a). The solutions were incubated in the dark under sterile conditions. Sampling times at 50 °C were 0, 1, 2, 3, 4, and 5 days, and at 25°C 0, 1, 3, 7, 15, 21, 24, and 30 days.

Pyraclostrobin was stable at pH 5 and 7, with a very slow degradation at pH 9 at 25 °C. At high temperatures (50 °C) and under alkaline conditions (pH 9) a faster degradation was observed, but these do not represent environmental conditions. The recoveries of ^{14}C ranged from 91% to 107% (25°C).

Aqueous photolysis

Photolysis was measured with both labels at pH 5 in sterile aqueous buffer solutions at about 0.5 mg/l (Scharf, 1998a, 1999c).

Sterilized glass vessels with quartz glass caps containing 20 ml test solution were irradiated in a thermostatted block under a xenon lamp, with a light intensity of about 3 mW/cm^2 and a cut-off for wavelengths <290 nm to simulate natural sunlight, for 25 days with continuous irradiation. Test solutions were stored in a climatic chamber as dark controls. The temperature was 22 ± 1 °C.

Degradation of the active substance was very rapid, with numerous degradation and rearrangement products, only some of them being stable under the simulated environmental conditions. Five products occurred at levels above 10% of the TAR: BF 500-11, BF 500-13, BF 500-14, BF 500-15, and 500M58. With the chlorophenyl label, about 22% of the TAR was mineralised after 15 days.

The dark control showed no degradation, as was to be expected from the results of the hydrolysis study.

The half-lives of the active substance and the main metabolites were calculated with the Model Maker computer program. The results are shown in Table 34.

Table 34. Half-lives of pyraclostrobin and major degradation products during aqueous photolysis (continuous irradiation).

Compound	half-life [days]		
	chlorophenyl label	tolyl label	mean value
pyraclostrobin	0.04	0.08	0.06
BF 500-14 (500M76)	0.22	0.34	0.28
500M58	7.14	10.14	8.64
BF 500-15 (500M78)	4.62		-
BF 500-11 (500M60)		-[1]	
BF 500-13 (500M62)		30.67	-

[1] no calculation possible

The quantum yield of pyraclostrobin was estimated to be 2.17 x 10^{-1}. From the quantum yield and absorption spectrum the theoretical photolytic half-life of pyraclostrobin in the top layer of aqueous systems was calculated by computer program to range from 0.7 days (June/July) to 1.7 days (April).

Biodegradation

The aerobic biodegradation of pyraclostrobin was evaluated by Reuschenbach (1999) by the Manometric Respirometry Test. Mixtures of the test substance at a concentration of 100 mg/l, a defined inorganic medium and a non-preadapted inoculum were incubated in a respirometer (Sapromat). The inoculum was activated sludge from laboratory wastewater treatment plants that were fed with municipal and synthetic sewage. The test vessels and appropriate controls were incubated and aerated at room temperature for up to 28 days. The oxygen for biodegradation was continuously produced and measured by the test apparatus. For evaluation the measured biochemical oxygen demand (BOD) is compared with the calculated theoretical oxygen demand (ThOD). After 28 days a degree of biodegradation of 0-10% of the ThOD was measured. The test substance was considered as poorly biodegradable.

Degradation in water/sediment systems

Test vessels filled with about 1.5 cm sediment and a water layer of about 15 cm were incubated with pyraclostrobin (both labels, applied separately) (Ebert, 1999d). The rate roughly corresponds to twice the maximum recommended application rate of 250 g active substance/ha, when assuming direct overspray of a 30 cm depth of water. The treated water/sediment systems were incubated in a climatic chamber, where light and temperature conditions of central Europe were simulated (daily exposure and temperature cycles in the period of May 17–July 18). Water samples were taken at 0, 3, 6, and 9 h, and 1, 2, 3, 7, 10, 14, 21, 30, 45 and 62 days after treatment. Sediment samples were taken 1, 3, 7, 14, 30, 45, and 62 days after treatment.

The results showed that pyraclostrobin follows two major dissipation and degradation pathways in a natural water system. When reaching water, it undergoes a very rapid photolytic transformation forming many breakdown products and it is simultaneously adsorbed very quickly to the sediment where it is finally bound.

HPLC analysis revealed that three major products (>10% of the TAR) were formed in the water phase, BF 500-11, BF 500-13, BF 500-14. All three were identified in the aqueous photolysis study. BF 500-15 and 500M58,which are also formed during aqueous photolysis at levels above 10%, could not be detected in any samples.

In the sediment, pyraclostrobin is quickly demethoxylated forming 500M07 which reached a maximum of 17% of the TAR. Because of its low water-solubility and high K_{oc} value, 500M07 is not likely to move from the sediment into the water. It is degraded further in the sediment and finally the radioactivity is bound to the sediment. The water-soluble degradation products are found in the sediment only at very low levels.

The half-lives of pyraclostrobin and its degradation products are shown in Table 35. No reasonable half-life could be calculated for BF 500-13 in this study, but the results of the aqueous photolysis study clearly showed that it is degradable in water under irradiated conditions.

Table 35. Half-lives of pyraclostrobin and degradation products in the water/sediment study under irradiated conditions.

Compound	Half-life [days] (first order)
pyraclostrobin (water)	5
BF 500-11 (water)	20
BF 500-13 (water)	-[1]
BF 500-14 (water)	14
pyraclostrobin (sediment)	4
500M07 (sediment)	99

[1] no reasonable calculation possible

Residue in rotational crops

A rotational crop study with tolyl- and chlorophenyl-labelled pyraclostrobin was reported (Veit, 2000). [^{14}C]pyraclostrobin was applied, as an acetone solution, to the surface of a bare, loamy sand at a rate equivalent to 900 g ai/ha. After application, the soil was aged for 30 days (simulating an emergency plant-back), 120 days (simulating an autumn plant-back) and 365 days under natural climatic conditions. After those time intervals, ploughing was simulated by mixing treated and untreated soil layers. Radish, lettuce and wheat were then sown or planted. Samples of mature crops were analysed by combustion and LSC to determine the TRR. In addition, soil samples were taken after application, ploughing and harvest of mature crops.

The soil was loamy sand with pH 6.4 and organic matter 0.8%. Sand, silt and clay contents were respectively 89%,6% and 5%.

All samples were extracted with methanol and, in some cases, also water and/or aqueous ammonia. The remaining radioactive residues were treated with DMSO, sodium hydroxide and/or enzymes to release part of the remaining radioactivity. All methanol extracts yielding residues $\geq$0.009 mg/kg, and the methanol extract of wheat grain with a lower concentration, were analysed by high-pressure liquid chromatography.

`The results are summarized in Tables 36-38. Only the results from the rate of 900 g ai/ha are discussed. The study also included an application rate of 1500 g ai/ha to cover the maximum recommended use rate in the USA. The two application rates showed no major differences in the residue levels.

The low residue levels in the crops indicated that there was little translocation from the soil.

Table 36. Fractionation of radioactive residues in rotational crops after treatment with [^{14}C]pyraclostrobin (tolyl and chlorophenyl labels).

Sample, Days after planting or sowing	TRR	MeOH extract		MeOH + H_2O +NH_3 extracts		Unextracted	
	mg/kg	mg/kg	% of TRR	mg/kg	% of TRR	mg/kg	% of TRR
Plant-back interval: 30 DAT	Tolyl label						
Radish Plant 48	0.025	0.010	39.5	0.010	39.5	0.013	52.5
Radish Roots 48	0.025	0.012	45.9	0.012	45.9	0.011	44.7
Lettuce Head 61	0.013	0.005	42.1	0.005	42.1	0.007	55.3
Wheat Straw 167	0.114	0.019	16.6	0.030	26.0	0.072	63.2
Wheat Grain 167	0.082	0.005	6.5	0.020	24.0	0.060	73.7

Sample, Days after planting or sowing	TRR	MeOH extract		MeOH + H_2O +NH_3 extracts		Unextracted	
	mg/kg	mg/kg	% of TRR	mg/kg	% of TRR	mg/kg	% of TRR
Plant-back interval: 30 DAT	Chlorophenyl label						
Radish Plant 47	0.028	0.011	38.8	0.014	49.2	0.007	26.8
Radish Roots 47	0.040	0.018	44.3	0.020	48.8	0.017	43.5
Lettuce Head 60	0.011	0.005	42.3	0.005	45.8	0.004	40.6
Wheat Straw 166	0.112	0.024	21.4	0.030	26.8	0.071	63.2
Wheat Grain 166	0.078	0.003	4.5	0.006	9.0	0.065	84.2
Plant-back interval: 120 DAT	Tolyl label						
Radish Plant 65	0.009	0.003	35.2	0.003	35.2	0.006	67.9
Radish Roots 65	0.008	n. d.	n. d.	n. d.	n. d.	n. d.	n. d.
Lettuce Head 76	0.011	0.004	37.1	0.004	37.1	0.007	62.1
Wheat Straw 157	0.081	0.009	11.6	0.014	17.4	0.055	68.2
Wheat Grain 157	0.089	0.006	6.3	0.020	22.1	0.064	71.6
Plant-back interval: 120 DAT	Chlorophenyl label						
Radish Plant 64	0.011	0.004	32.1	0.005	37.5	0.004	38.8
Radish Roots 64	0.006	0.003	43.1	0.003	47.4	0.002	36.2
Lettuce Head 75	0.009	0.003	34.8	0.004	43.6	0.004	45.0
Wheat Straw 156	0.079	0.012	15.0	0.015	18.9	0.063	79.9
Wheat Grain 156	0.079	0.005	6.6	0.009	11.7	0.058	72.9
Plant-back interval: 365 DAT	tolyl label						
Radish Plant 48	0.010	0.002	23.6	0.002	23.6	0.004	43.4
Radish Roots 48	0.014	0.006	40.4	0.006	40.4	0.007	48.3
Lettuce Head 62	0.017	0.006	32.3	0.006	32.3	0.007	40.2
Wheat Straw 153	0.067	0.009	12.9	0.014	21.2	0.046	68.8
Wheat Grain 153	0.013	0.001	4.6	0.004	25.6	0.007	53.7
Plant-back interval: 365 DAT	Chlorophenyl label						
Radish Plant 47	0.006	n. d.	n. d.	n. d.	n. d.	n. d.	n. d.
Radish Roots 47	0.004	n. d.	n. d.	n. d.	n. d.	n. d.	n. d.
Lettuce Head 61	0.007	0.003	39.6	0.003	39.6	0.003	47.9
Wheat Straw 152	0.069	0.021	30.8	0.021	30.8	0.046	67.0
Wheat Grain 152	0.010	0.001	5.5	0.001	5.5	0.009	94.7

DAT: days after treatment
n. d.: not determined

After a plant-back interval of 30 days, the highest total radioactive residues were found in wheat straw (0.114 and 0.112 mg/kg with tolyl and chlorophenyl labels respectively). Wheat grain contained 0.082 and 0.078 mg/kg, lettuce heads 0.013 and 0.011 mg/kg, and radish roots 0.025 and 0.040 mg/kg. After longer plant-back intervals, the residue levels in radish roots decreased to 0.008 and 0.006 mg/kg for an interval of 120 days and to 0.014 and 0.004 mg/kg for 365 days. In lettuce heads, the residue levels did not change significantly after longer plant-back intervals. The residue levels in wheat grain after a plant-back interval of 120 days were similar to those after 30 days, but decreased significantly after 365 days to 0.013 and 0.010 mg/kg. The residue levels in wheat straw declined continuously at later plant-back periods (120 days 0.081 and 0.079 mg/kg; 365 days 0.067 and 0.069 mg/kg. A proportion of the radioactivity remained in the unextracted residues. Because of the overall low residue levels in radish and lettuce samples, unextracted radioactivity corresponded to ≤0.017 mg/kg. The unextractable residues in wheat straw were 0.046-0.072 mg/kg (≥63.2% of the TRR), and in wheat grain 0.007-0.065 mg/kg (≥53.7% of the TRR), with the lowest concentrations after a plant-back interval of 365 days.

Unextracted radioactive residues from radish plants, radish roots and lettuce heads were treated with a macerozyme incubation to release additional residues, yielding a further 8.4-13.6% of the remaining radioactivity in the radish roots. Some of this was associated with natural products such as cellulose or hemicellulose.

A high proportion of the unextracted radioactivity of wheat straw could be released by the extraction and precipitation methods for cellulose and lignin. After plant-back intervals of 30 and 120 days, the radioactive residues in the cellulose fraction were 0.018 mg/kg and 0.020 mg/kg ($\geq$17.0% of the TRR) and after 365 days 0.014 and 0.008 mg/kg (21.2 and 11.6% of the TRR) for the tolyl and chlorophenyl labels. Some further radioactivity was found in the lignin fractions (lignin solid: <0.001 - 0.021 mg/kg; lignin liquid: 0.004 - 0.033 mg/kg).

Treatment of the unextracted radioactive residues of wheat grain to determine their concentration in the starch fraction accounted for 0.001 to 0.036 mg/kg, the lowest concentrations after a plant-back interval of 365 days. Low concentrations of radioactive residues were also detected in the cellulose, lignin solid, and lignin liquid fractions.

Table 37. Total radioactive residues in soil samples after treatment with [^{14}C]pyraclostrobin (tolyl and chlorophenyl labels).

Sample	Tolyl label TRR [mg/kg]	Chlorophenyl label TRR [mg/kg]
After application 0 days	8.621	9.681
Plant-back intervals (after soil aging and ploughing)		
30 days	0.315	0.373
120 days	0.339	0.351
365 days	0.304	0.309
After harvest of mature crops Plant-back interval: 30 days		
Radish	0.273	0.356
Lettuce	0.338	0.371
Wheat	0.347	0.367
Plant-back interval: 120 days		
Radish	0.300	0.320
Lettuce	0.289	0.310
Wheat	0.260	0.305
Plant-back interval: 365 days		
Radish	0.287	0.273
Lettuce	0.191	0.284
Wheat	0.242	0.242

Table 38. Fractionation of residues in rotational crops after treatment with [^{14}C]pyraclostrobin (tolyl and chlorophenyl labels).

Sample, Days after planting, Days after treatment	TRR mg/kg	Unextracted mg/kg [% TRR]	MeOH extract mg/kg [% TRR]	Parent and Demethoxy mg/kg (% of TRR)	Metabolite fractions (combined in regions defined by retention times) mg/kg/[% TRR]
Tolyl label					
Radish Plant, DAP 48 DAT 30	0.025	0.013 (52.5%)	0.010(39.5%)	0.0011(4.4%)	polar 0.0021/8.1% medium : 0.0051/20.4% 3 peaks
Radish Roots, DAP 48 DAT 30	0.025	0.011 (44.7%)	0.012 (45.9%)	0.0024 (9.0%) 0.0002(0.8%)	polar : 0.0078/29.9% medium polar a: 0.0004/1.7% medium polar b: 0.0012/4.6% 2 peaks

Sample, Days after planting, Days after treatment	TRR mg/kg	Unextracted mg/kg [% TRR]	MeOH extract mg/kg [% TRR]	Parent and Demethoxy mg/kg (% of TRR)	Metabolite fractions (combined in regions defined by retention times) mg/kg/[% TRR]
Wheat Straw, DAP 167 DAT30	0.1	0.072(63.2%)	0.019(16.6%)	0.0120 (10.5%)	polar : 0.0070/6.1% 2 peaks
Wheat Straw, DAP 153 DAT 365	0.067	0.046 (68.8%)	0.009 (12.9%)	0.0010 (1.4%)	polar : 0.0022/3.2% medium polar c: 0.0058/8.3% 2 peaks
Chlorophenyl label					
Radish Plant, DAP 47 DAT30	0.028	0.007 (26.8%)	0.011 (38.8%)	0.0103 (36.4%)	polar: 0.0001/0.3% medium polar b: 0.0006/2.2%2 peaks
Radish Roots, DAP 47 DAT30	0.040	0.017 (43.5%)	0.018 (44.3%)	0.0106 (26.0%)	polar 0.0046/11.3% medium polar b:0.0026/6.3%2 peaks non polar:0.0003/0.6% 2 peaks
Wheat Straw, DAP 166 DAT30	0.112	0.071 (63.2%)	0.024 (21.4%)	0.0147 (13.1%)	polar 0.0032/2.9% 2 peaks medium polar a:0.0037/3.3% medium polar b:0.0012/1.1% 2 peaks medium polar c:0.0012/1.1%) 3 peaks
Wheat Grain, DAP 156 DAT 120	0.079	0.058 (72.9%)	0.005 (6.6%)	n. d.	polar: 0.0050/6.6%

The MeOH-extractable radioactive residues were characterized by HPLC and in some cases TLC. Because of the overall low radioactive residues, only the parent compound and the demethoxy metabolite (500M07) were identified by co-chromatography. All the other degradation products were combined in regions defined by retention times and polarity, where each region consisted of one or more peaks (the individual peaks were very low). For all samples, a total of 5 different regions could be defined (a polar region, medium polar regions a-c and a nonpolar region). Nonpolar metabolites known from soil degradation studies were not observed in the plant samples from any of the plant-back intervals. Those metabolites were apparently not translocated from the soil.

After a plant-back interval of 30 days, a major part of the radioactivity in the extracts of radish roots was detected in the polar region. The parent was found at 0.0024 and 0.0106 mg/kg (tolyl and chlorophenyl labels). Low radioactive residues were found in the polar and in the medium polar regions a and b.

In the extracts of wheat straw after a plant-back interval of 30 days, the tolyl- and chlorophenyl-labelled parent were detected at concentrations of 0.0120 and 0.0147 mg/kg (10.5/ 13.1% of the TRR). In addition the polar region, and in the case of the chlorophenyl label the medium polar regions a and b, could be observed. After a plant-back interval of 120 days, the concentration of the parent was lower (chlorophenyl label: 0.0011 mg/kg or 1.4% of the TRR). In addition, the polar region and the medium polar regions a and b could be observed. After a plant-back interval of 365 days, the concentration of the parent ranged from 0.0010 to 0.0023 mg/kg (1.4 to 3.3% of the TRR). In addition, the polar region and the medium polar regions a and c could be observed. The medium polar region c was only found in the wheat samples.

In the case where the MeOH extract of wheat grain was analysed, the parent compound could not be detected and the radioactivity was in the very polar region.

In rotational crops, the proposed metabolic pathways follow the previously identified routes.

RESIDUE ANALYSIS

Analytical methods

The Meeting received descriptions of, and validation data on, analytical methods for pyraclostrobin and metabolite residues in crops, animal commodities, soil and water The residues were determined by HPLC-MS/MS and HPLC-UV as in Table 39.

Table 39. Summary of analytical methods for residues.

Sample type	Samples analysed	Method of quantification	LOQ	Reference Author, Year
PLANTS				
Wheat	Forage, Straw Grain	HPLC-MS/MS	0.02 mg/kg for pyraclostrobin and metabolite BF 500-3 in all samples	Reinhard K., Mackenroth C., 1999 (Validation of BASF method No. 421/0 (Germany)/D9808 (USA): Determination of pyraclostrobin and its metabolite BF 500-3 in wheat, grape, peanut and orange matrices) BASF RegDoc# 1999/11134
Grapes	Berries			
Peanut	Kernels			
Orange	Whole fruit			
Wheat	Forage, Straw Grain	HPLC-MS/MS	0.02 mg/kg for pyraclostrobin and metabolite BF 500-3 in all samples	Perez R., Perez S., 2000 (Independent method validation of BASF numbers D9908 (USA) and 421/0 (Germany) entitled "Method for determination of pyraclostrobin and its metabolite BF 500-3 residues in plant matrices using LC/MS/MS") BASF RegDoc# 1999/5187
Grapes	Berries			
Peanut	Kernels			
Orange	Whole fruit			
Wheat	Forage, Straw Grain	HPLC-UV and HPLC-UV (different HPLC systems)	0.02 mg/kg for pyraclostrobin and metabolite BF 500-3 in all samples	Abdel-Baky S., Riley M., 2000 (Validation of BASF analytical method D9904, method for determination of pyraclostrobin and its metabolite BF 500-3 residues in plant matrices using HPLC-UV) BASF RegDoc# 1999/5179
Grapes	Berries			
Peanut	Kernels			
Orange	Whole fruit			
Wheat	Forage, Straw Grain	HPLC-UV	0.02 mg/kg for pyraclostrobin and metabolite BF 500-3 in all samples	Jordan J., 2000 (Independent method validation of BASF analytical method D9904 entitled "Method for the determination of pyraclostrobin and its metabolite BF 500-3 residues in plant matrices using HPLC-UV") BASF RegDoc# 1999/5184
Grapes	Berries			
Peanut	Meat			
Orange	Whole fruit			
Barley process fractions	Beer Brewer's yeast Brewing malt Spent grains and flocs,Pot barley Malt sprouts	HPLC-MS/MS	0.02 mg/kg for pyraclostrobin and metabolite BF 500-3 in all samples	Reinhard K., Mackenroth C.,1999b (Validation of BASF method No. 453/0: Determination of pyraclostrobin and its metabolite BF 500-3 in matrices/fractions of the processing of barley) BASF RegDoc# 1999/11135
DFG S19 Multi-method check		GC-ECD GC-NPD	Method not applicable	Weeren R.D., Pelz S., 1999 BASF RegDoc# 1999/10833
ANIMALS				
Cow/hen	Milk Meat,Fat,Liver Kidney, Egg	HPLC-UV and reversed phase HPLC-UV	0.01 mg/kg milk 0.05 mg/kg all others, for pyraclostrobin	Kampke-Thiel K., 1999 (Validation of BASF method 439/0 for the determination of pyraclostrobin (as parent compound) in matrices of animal origin) BASF RegDoc# 1999/11079
Cow/hen	Milk Meat	HPLC-UV and reversed phase	0.01 mg/kg 0.05 mg/kg	Levsen K., 1999 (validation of method No. 439/0) BF RegDoc# 1999/11369

Sample type	Samples analysed	Method of quantification	LOQ	Reference Author, Year
Cow	Milk	GC-MS	0.01 mg/kg Reg.No. 342 878 Reg.No. 412 041 (methylated forms)	Tilting N., Lehmann W., 2000 (Validation of analytical method 446 for the determination of pyraclostrobin (reg. No. 304428) in sample material of animal origin) BASF RegDoc# 1999/11075)
	Milk Meat Fat Liver Kidney	HPLC-MS/MS Total method based on hydroxypyrazole measurement	0.01 mg/kg 0.05 mg/kg Reg.No. 298 327 Reg.No. 399 530 in all tissue samples	

<u>Plant material</u>

Plant material except peanut kernels and oil is extracted with a methanol/water mixture, filtered, and diluted with distilled water. For peanut kernels and oil acetonitrile/n-hexane is used for extraction and the ACN layer separated, evaporated to dryness and dissolved in the methanol/water mixture. Further clean-up is on a micro C_{18}-column and a micro silica gel column, and the purified residue is taken up in a methanolic buffer solution for HPLC-MS/MS determination, monitoring the transition ions m/z = 388 → 194 for pyraclostrobin and m/z = 358 →164 for metabolite 500M07. Because of the high specificity of HPLC-MS/MS no confirmatory technique is necessary.

The method of Abdel-Baky and Riley (2000a) is identical except that the purified residue is taken up in an ACN/water mixture for determination of pyraclostrobin and 500M07 by HPLC-UV using column switching on reversed-phase columns. Confirmation is by HPLC-UV determination with a different chromatographic system. The method is recommended for monitoring purposes.

In the method of Reinhard and Mackenroth (1999b) for barley and its processed products pyraclostrobin and 500M07 are extracted with a mixture of methanol, water and hydrochloric acid. An aliquot of the extract is centrifuged and partitioned against cyclohexane. After evaporation of cyclohexane, the purified residue is taken up in a methanolic buffer solution for HPLC-MS/MS determination monitoring the same ions as above.

The multi-residue method DFG S 19 is not applicable to the separate determination of pyraclostrobin and 500M07, because both compounds undergo thermal breakdown to the same product during GC analysis.

<u>Animal samples</u>

After extraction with acetonitrile/hexane, filtration and phase separation the ACN phase (containing the water) is partitioned with hexane. The aqueous ACN phase is partitioned with DCM, and the organic layer concentrated and cleaned up on a silica gel micro column. Pyraclostrobin is then determined by HPLC using column switching on normal phase columns and UV detection at 270 nm. Reversed-phase HPLC-UV is used as a confirmatory method.

A method to determine pyraclostrobin and its metabolites was developed for data generation. For fortification a synthetic reference compound, BF 500-10, was used as a model compound for metabolites of pyraclostrobin. A GC-MS version of this method was validated for milk, and a more straightforward process using HPLC-MS/MS for quantification was validated for milk and tissues.

In the GC-MS (446/0) the residues are extracted with acetonitrile and partitioned against hexane, and the extract boiled with potassium hydroxide solution. The solution is acidified and the pyrazoles formed are extracted with ethyl acetate. After clean-up on a silica gel column, they are methylated using methyl iodide and finally cleaned up by a combination of SPE cartridges.

In the HPLC-MS/MS method (446/1) tissue samples are boiled with potassium hydroxide solution under reflux. After extraction of the pyrazoles formed with dichloromethane, the analytes are cleaned up by silica gel chromatography and partitioned between an acid aqueous phase and organic solvents. Quantification is achieved by HPLC-MS/MS monitoring the mass transitions m/z = 195 to

153 and 211 to 194. Residues in milk and fat are extracted with acetonitrile before treatment with potassium hydroxide. Owing to the higher specificity of the HPLC-MS/MS determination, no confirmatory technique is necessary.

Table 40. Validation data for analytical methods for the determination of pyraclostrobin residues in food of plant and animal origin

Reference	Sample	Test compound	Fortified level, mgkg	Average recovery[%]	RSD [%]	No. of analyses
Reinhard K., Mackenroth C. (1999a)	Wheat: Forage	pyraclostrobin	0.02 2.00	94.9 91.1	3.0 2.2	5 5
		BF 500-3	0.02 2.00	92.1 90.3	3.9 3.5	5 5
	Straw	pyraclostrobin	0.02 2.00	80.4 82.4	7.4 4.7	5 5
		BF 500-3	0.02 2.00	76.2 73.4	6.5 5.5	5 5
	Grain	pyraclostrobin	0.02 0.2	74.9 90.1	1.7 4.3	4 5
		BF 500-3	0.02 0.2	75.6 86.8	3.1 4.1	5 5
	Grapes	pyraclostrobin	0.02 2.00	89.5 94.1	2.3 5.5	5 5
		BF 500-3	0.02 2.00	88.1 93.3	1.4 7.2	5 5
	Peanut (kernels)	pyraclostrobin	0.02 0.2	78.5 89.0	4.4 10.0	5 5
		BF 500-3	0.02 0.2	76.0 85.3	4.2 8.5	5 5
	Orange	pyraclostrobin	0.02 0.2	76.3 86.8	3.9 5.2	5 5
		BF 500-3	0.02 0.2	73.9 82.6	5.0 6.3	5 5
Perez R., Perez S. (2000)	Wheat: Straw	pyraclostrobin	0.02 6.00	91 86	11.5 4.3	5 5
		BF 500-3	0.02 6.00	81 86	21.9 2.4	5 5
	Grapes	pyraclostrobin	0.02 2.00	87 101	6.7 3.0	5 5
		BF 500-3	0.02 2.00	79 97	4.6 3.0	5 5
Abdel-Baky S., Riley M. (2000)	Wheat: Forage	pyraclostrobin	0.02 2.00	101.0 95.0	4	5 5
		BF 500-3	0.02 2.00	90.0 87.0	6	5 5
	Straw	pyraclostrobin	0.02 2.00	101.0 85.0	10	5 5
		BF 500-3	0.02 2.00	102.0 76.0	17	5 5
	Grain	pyraclostrobin	0.02 2.00	88.0 101.0	17	5 4
		BF 500-3	0.02 2.00	77.0 89.0	19	5 4
	Grapes	pyraclostrobin	0.02 2.00	112.0 98.0	14	5 5
		BF 500-3	0.02 2.00	84.0 90.0	15	5 5
	Peanut (kernels)	pyraclostrobin	0.02 2.00	106.0 102.0	6	5 5
		BF 500-3	0.02 2.00	80.0 88.0	8	5 5
	Orange	pyraclostrobin	0.02 2.00	99.0 96.0	12	5 5

Reference	Sample	Test compound	Fortified level, mgkg	Average recovery[%]	RSD [%]	No. of analyses
		BF 500-3	0.02 2.00	104.0 87.0	15	5 5
Jordan J. (2000)	Wheat: Straw	pyraclostrobin	0.02 6.00	97.8 77.5	6.1 9.0	5 5
		BF 500-3	0.02 6.00	92.4 73.3	6.8 8.2	5 5
	Grapes	pyraclostrobin	0.02 2.00	84.8 90.7	18.6 5.4	5 5
		BF 500-3	0.02 2.00	75.3 83.6	8.2 6.6	5 5
Reinhard K., Mackenroth C. (1999b)	Beer	pyraclostrobin	0.02 0.2	96.2 91.7	4.5 8.8	5 5
		BF 500-3	0.02 0.2	97.8 94.0	7.5 2.3	5 5
	Brewer's yeast	pyraclostrobin	0.02 0.2	101.6 98.3	5.3 9.3	4 5
		BF 500-3	0.02 0.2	100.2 99.3	1.7 10.1	5 5
	Brewing malt	pyraclostrobin	0.02 0.2	99.3 93.5	3.5 3.2	4 5
		BF 500-3	0.02 0.2	89.3 88.2	2.1 0.7	5 5
	Spent grains and flocs	pyraclostrobin	0.02 0.2	104.6 104.7	10.6 2.2	5 5
		BF 500-3	0.02 0.2	86.0 101.8	5.2 2.0	5 5
	Pot barley	pyraclostrobin	0.02 0.2	102.9 110.2	1.4 9.0	5 5
		BF 500-3	0.02 0.2	101.3 103.3	2.1 2.9	5 5
	Malt sprouts	pyraclostrobin	0.02 0.2	105.1 96.0	5.4 2.8	5 5
		BF 500-3	0.02 0.2	94.6 94.0	3.3 2.5	5 5
Kampke-Thiel K. (1999)	Cow: Milk	pyraclostrobin	0.01 0.1	76.9 86.9	11.5 5.9	5 5
	Muscle	pyraclostrobin	0.05 0.5	88.6 91.4	6.1 6.0	5 5
	Liver	pyraclostrobin	0.05 0.5	94.1 86.8	4.1 7.2	5 5
	Kidney	pyraclostrobin	0.05 0.5	83.9 89.6	5.1 4.2	5 5
Kampke-Thiel K. (1999)	Fat	pyraclostrobin	0.05	85.7 93.9	3.2 7.1	4 5
	Hen: Eggs	pyraclostrobin	0.05 0.5	85.6 92.3	12.3 7.4	5 5
Levsen K., Kruppa J. (1999)	Milk	pyraclostrobin	0.01 0.1	97.2 91.0	7.5 2.6	5 5
	Meat	pyraclostrobin	0.05 0.5	88.6 94.5	10.8 1.2	5 5
Tilting N., Lehmann W. (2000)	Milk (GC-MS)	pyraclostrobin	0.01 0.1	74.8 68.5	3.7 8.5	5 5
	Milk (GC-MS)	BF 500-10	0.01 0.1	64.8 64.5	4.6 9.0	5 5
	Milk (HPLC-MS/MS)	pyraclostrobin	0.01 0.1	96.9 66.5	11.6 5.6	5 5
	Milk (HPLC-MS/MS)	BF 500-10	0.01 0.1	73.6 60.4	7.6 3.4	5 5
	Meat	pyraclostrobin	0.05 0.5	78.5 83.1	2.1 3.2	5 5
	Meat	BF 500-10	0.05 0.5	56.1 54.9	4.4 1.3	5 5

Reference	Sample	Test compound	Fortified level, mgkg	Average recovery[%]	RSD [%]	No. of analyses
	Liver	pyraclostrobin	0.05 0.5	80.0 81.7	7.6 3.2	5 5
	Liver	BF 500-10	0.05 0.5	65.7 82.4	4.1 3.2	5 5
	Kidney	pyraclostrobin	0.05 0.5	85.6 67.6	7.3 5.3	5 5
	Kidney	BF 500-10	0.05 0.5	66.2 60.2	4.6 7.7	5 5
	Fat	pyraclostrobin	0.05 0.5	77.4 90.6	14.9 10.5	5 5
	Fat	BF 500-10	0.05 0.5	83.4 87.7	24.1 14.7	5 5

Stability of pesticide residues in stored analytical samples

The deep freeze stability of pyraclostrobin and 500M07 in various plant samples is currently under investigation over a period of two years (Abdel-Baky and Riley, 1999). Untreated samples were fortified with 1.0 mg/kg pyraclostrobin and 500M07 and stored under the usual storage conditions for field samples (polyethylene bottle, -20°C). The samples were analysed with BASF method no. 421/0. So far, samples have been analysed after 1, 3, 6, 14 and 18 months frozen storage (<-10°C). The results are given in Table 41.

Table 41. Storage stability of pyraclostrobin and 500M07 in various plant samples fortified at 1 mg/kg.

Sample	Average relative recovery[1] (%)					
	0-Month	1-Month	3-Month	6-Month	14-Month	18-Month [2]
pyraclostrobin						
Peanut Kernels	92	96	90	91	95	88
Peanut Oil	105	92	102	118	101	106
Wheat Grain	105	92	87	91	82	88
Wheat Straw	93	96	96	113	71	99
Sugarbeet Tops	103	100	97	100	91	98
Sugarbeet Roots	92	94	92	96	78	91
Tomatoes	104	98	96	90	91	96
Grape Juice	91	96	94	96	69	88
500M07						
Peanut Kernels	94	96	112	92	92	84
Peanut Oil	104	92	102	122	103	120
Wheat Grain	101	90	86	86	79	89
Wheat Straw	90	91	99	104	63	97
Sugarbeet Tops	103	101	99	99	93	99
Sugarbeet Roots	87	97	97	94	78	91
Tomatoes	103	98	97	85	85	92
Grape Juice	92	95	92	94	80	93

1. Relative recovery is equal to average stored recovery times 100 divided by average procedural recovery.

Deep freeze stability was investigated by Tilting and Knoell (2000b). Untreated samples of muscle, liver and milk from a cow were fortified with 0.5 mg/kg (0.1 mg/kg in the case of milk) pyraclostrobin, or a mixture of pyraclostrobin and the same level of 500M07. All samples were stored under the usual storage conditions for samples (polyethylene bottles, -20°C). Whereas for method 439/0 the parent compound is the analyte, for method 446/1 pyraclostrobin and BF 500-10 are the "parent" substances for the analytes BF 500-5 and BF 500-8. Other potential metabolites will also form these analytes on cleavage of the methylene ether bridge. After approximately 0, 30, 60, 90, 120, and 240 days, samples were analysed according to methods 439/0 and 446/1. The analytical results were corrected for individual procedural recoveries.

Table 42. Summary of results from the storage stability study (uncorrected residues).

Sample	0 day	30 day	60 day	90 day	120 day	240 day
Average results for pyraclostrobin analysed with method 439 (mg/kg)						
Liver	0.456 85.8%	0.443 87.8%	0.470 96.6%	0.425 75.7%	0.426 91.7%	0.426 101%
Muscle	0.419 82.9%	0.409 90.5%	0.447 92.7%	0.415 90.3%	0.453 86.2%	0.504 100.7%
Milk	0,094. 93.1 %	0.089 89.8%	0.095 98.2 %	0.095 85.2%	0.098 92.3%	0.100 96.%
Average results for pyraclostrobin analysed with method 446 (mg/kg)						
Liver	0.412 80.5%	0.392 82.6%	0.348 66.3%	0.360 73.2%	0.404 87.3%	0.412 97.4%
Muscle	0.383 72.1%	0.322 77.6%	0.379 79.4%	0.348 67.8%	0.381 83.9%	0.461 101.3
Milk	0.080 73.7%	0.077 90.6%	0.080 63.9%	0.085 86.8%	0.085 94.3%	0.060 108.3%
Average results for BF 500-10 analysed with method 446 (mg/kg)						
Liver	0.383 75.4%	0.475 91.0%	0.389 81.0%	0.356 73.7%	0.359 80.2%	0.305 86.0%
Muscle	0.358 68.3%	0.283 65.2%	0.373 77.4%	0.338 76.6%	0.328 74.7%	0.295 68.0%
Milk	0.080 66.6%	0.088 89.7%	0.088 69.3%	0.093 89.9%	0.088 92.2%	0.053 83.7%

The residues found at the different time intervals were used to calculate a degradation curve of the compounds using a semilogarithmic transformation. The loss calculated after 240 days of storage is shown in Table 43.

Table 43. Loss of compounds during storage

	Pyraclostrobin Parent method (439/0)	Pyraclostrobin Total method (446/1)	BF 500-10 Total method (446/1)
Liver	7.3%	- 5.1%[1]	28.8%
Muscle	- 21.7% [1]	- 29.2%[1]	11.9%
Milk	- 8.8%[1]	- 2.8%[1]	35.8%

[1] a negative value indicates a calculated increase

USE PATTERN

Pyraclostrobin is used as fungicide with foliar application. Information on registered uses provided to the Meeting is summarized in Table 44.

Table 44. Registered uses of pyraclostrobin.

Crop	Country	Formulation		Application						PHI
		Type	Conc	Method	nb	Inter d	Rate kg/hl	Water l/ha	Rate kg ai/ha	days
Almond	USA	WG	20%	foliar	4	7-14			0.133	>100
Apple	Brazil	EC	250g/l	foliar	4	7-14	0.010	1000	0.100	14
Apricot	USA	WG	20%	foliar	5	7-14			0.133	0
Artichoke	USA	EC	250g/l	foliar	6	7-14			0.219	3
Banana	Brazil	EC	250g/l	foliar	5	14-35	0.667	15	0.100	3
Banana	Brazil	SE	133g/l	foliar	5	30	0.447	15	0.067	3
Banana	Colombia	EC	250g/l	foliar	4	90			0.075-0.1	0
Banana	Costa Rica	EC	250g/l	foliar	4	90			0.075-0.1	0
Banana	Honduras	EC	250g/l	foliar	4	90			0.075-0.1	0
Barley	Belgium, Luxembourg	SE	133g/l	foliar	2		0.100	200	0.200	
Barley	Brazil	EC	250g/l	foliar	2	15	0.100	200	0.200	30
Barley	Brazil	SE	133g/l	foliar	2	15-20	0.067	200	0.133	30
Barley	Canada	EC	250g/l	foliar	2	10-14	0.1-0.15	100	0.1-0.15	
Barley	Denmark	EC	250g/l	foliar	2	14-28		150-300	0.250	42
Barley	Estonia	SE	133g/l	foliar	1	14-28		150-300	0.133	35
Barley	France	SE	133g/l	foliar	2	21-35	0.133	150	0.200	35

Crop	Country	Formulation		Application						PHI
		Type	Conc	Method	nb	Inter d	Rate kg/hl	Water l/ha	Rate kg ai/ha	days
Barley	France	EC	250g/l	foliar	2		0.125	200-400	0.250	35
Barley	Germany	EC	250g/l	foliar	2		0.125		0.250	35
Barley	Germany	SE	133g/l	foliar	2		0.115	200-400	0.233	35
Barley	Macedonia	WG	5%	foliar	4		0.008	1000	0.075	35
Barley	Switzerland	SE	133g/l	foliar	1				0.233	35
Barley	UK	EC	250g/l	foliar	2		0.125	200	0.250	35
Barley	USA	EC	250g/l	foliar	2	10-14			0.228	40
Barley spring	Ireland	EC	250g/l	foliar	2				0.250	
Barley spring	Ireland	SE	133g/l	foliar	2				0.200	
Barley spring	UK	SE	133g/l	foliar	2		0.100	200	0.200	
Barley. spring	UK	SE	114g/l	foliar	2		0.100	200	0.200	
Barley. winter	Ireland	EC	250g/l	foliar	2				0.250	
Barley.winter	Ireland	SE	133g/l	foliar	2				0.200	
Barley. winter	UK	SE	133g/l	foliar	2		0.100	200	0.200	35
Barley. winter	UK	SE	114g/l	foliar	2		0.100	200	0.200	
Bean	Brazil	EC	250g/l	foliar	3	10-14	0.025	300	0.075	14
Bean dry	Canada	EC	250g/l	foliar	2	10-14	0.100	100	0.100	30
Beans dry	USA	EC	250g/l	foliar	2	10-14			0.22	30
Beech nut	USA	WG	20%	foliar	4	7-28			0.133	14
Beet, Sugar	Canada	EC	250g/l	foliar	4	14-21	0.84-0.11	200	0.1-0.225	7
Pepper, Bell	USA	WG	20%	foliar	6	7-14			0.224	0
Salsify black	USA	WG	20%	foliar	3	7-14			0.224	0
Blackberry	USA	WG	20%	foliar	4	7-14			0.196	0
Blueberry	Canada	WG	20%	foliar	4	10-14	0.089	225	0.200	1or29
Blueberry	USA	WG	20%	foliar	4	7-14			0.196	0
Brazil nut	USA	WG	20%	foliar	4	7-28			0.133	14
Bulb vegetables	Canada	WG	20%	foliar	3	7-14	0.05-0.07	225	0.112-0.168	7
Butter nut	USA	WG	20%	foliar	4	7-28			0.133	14
Caneberry	USA	WG	20%	foliar	4	7-14			0.196	0
Cantaloupe	USA	WG	20%	foliar	4	7-14			0.224	0
Carrot	Brazil	EC	250g/l	foliar	3	10-14	0.013	800	0.100	7
Carrot	USA	WG	20%	foliar	3	7-14			0.224	0
Cashew	USA	WG	20%	foliar	4	7-28			0.133	14
Cassava	USA	EC	250g/l	foliar	6	7-14			0.219	3
Celeriac	USA	WG	20%	foliar	3	7-14			0.224	0
Cereal	Latvia	EC	250g/l	foliar	2	14-28		150-300		
Cereal	Netherlands	EC	250g/l	foliar	2	21	0.133	150	0.200	35
Cherry	USA	WG	20%	foliar	5	7-14			0.133	0
Chervil	USA	WG	20%	foliar	3	7-14			0.224	0
Chestnut	USA	WG	20%	foliar	4	7-28			0.133	14
Chickpea	Canada	EC	250g/l	foliar	2	10-14	0.1-0.15	100	0.1-0.15	30
Chicory	USA	WG	20%	foliar	3	7-14			0.224	0
Chilli pepper	USA	WG	20%	foliar	6	7-14			0.224	0
Citrus	Argentina	EC	250g/l	foliar	3	30	0.005	1000	0.050	14
Citrus	Korea	EC	250g/l	foliar	4	15	0.006	4000	0.250	10
Coffee	Brazil	EC	250g/l	foliar	2	60	0.040	500	0.200	45
Coffee	Brazil	SE	133g/l	foliar	2	90	0.040	500	0.200	45
Cucumber	USA	WG	20%	foliar	4	7-14			0.224	0
Cucumber(2003)	Brazil	EC	250g/l	foliar	4	7-14	0.01	1000	0.100	7
Cucurbits	Canada	WG	20%	foliar	4	7-14	0.05-0.07	350	0.112-0.168	3
Currant	USA	WG	20%	foliar	4	7-14			0.196	0
Egg plant	USA	WG	20%	foliar	6	7-14			0.224	0
Elderberry	USA	WG	20%	foliar	4	7-14			0.196	0
Fruiting vegetable	Canada	WG	20%	foliar	6	7-14	0.05-0.08	225	0.112-0.2	0
Garlic	USA	WG	20%	foliar	6	14			0.168	7
Garlic (2003)	Brazil	EC	250g/L	foliar	3	14		200	0.100	7
Gherkin	USA	WG	20%	foliar	4	7-14			0.224	0
Gooseberry	USA	WG	20%	foliar	4	7-14			0.196	0
Grape	Brazil	EC	250g/l	foliar	4	14	0.010	1000	0.100	7
Grape	Croatia	WG	5%	foliar			0.010			42

Crop	Country	Formulation		Application						PHI
		Type	Conc	Method	nb	Inter d	Rate kg/hl	Water l/ha	Rate kg ai/ha	days
Grape	France	SE	40 g/l	foliar	3				0.160	35
Grape	Germany	EC	250g/l	foliar	3		0.010	400-1600	0.04-0.16	35
Grape	South Africa	EC	250g/l	foliar	3	10-14	0.010	1500	0.150	28
Grape	Switzerland	EC	250g/l	foliar	3				0.040	
Grape	Yugoslavia	WG	5%	foliar	4	12-14	0.010	1000	0.100	35
Grape	USA	WG	20%	foliar	6	10-14			0.168	14
Grapefruit	South Africa	EC	250g/l	foliar	2	42	0.003	6000	0.150	82
Grapefruit	USA	EC	250 g/l	foliar	4	10-21			0.274	14
Grass seed	Canada	EC	250 g/l	foliar	2	14-21	0.1-0.168	100	0.1-0.168	14
Grass seed	USA	EC	250g/l	foliar	2	14-21			0.219	14
Horse radish	USA	WG	20%	foliar	3	7-14			0.224	0
Huckleberry	USA	WG	20%	foliar	4	7-14			0.196	0
Leek	USA	WG	20%	foliar	6	14			0.168	7
Lemon	USA	EC	250g/l	foliar	4	10-21			0.274	14
Lentil	Canada	EC	250g/l	foliar	2	10-14	0.100	100	0.100	30
Lentil	USA	EC	250g/l	foliar	2	10-21			0.224	30
Loganberry	USA	WG	20%	foliar	4	7-14			0.196	0
Macadamia nut	USA	WG	20%	foliar	4	7-28			0.133	14
Maize	Brazil	EC	250g/l	foliar	2	20	0.050	300	0.150	45
Maize	Brazil	SE	133g/l	foliar	2	20	0.033	300	0.100	45
Mango	Brazil	EC	250g/L	foliar	2		0.01	1000	0.100	7
Melon	Brazil	EC	250g/l	foliar	4	7-10	0.010	1000	0.100	7
Melon	Brazil	WG	5%	foliar	4	7-10	0.025	400	0.100	7
Melon Muskmelon	USA	WG	20%	foliar	4	7-14			0.224	0
Oats	Brazil	EC	250g/l	foliar	1		0.100	200	0.200	30
Oats	Brazil	SE	133g/l	foliar	1		0.067	200	0.133	30
Oats	France	SE	133g/l	foliar	2	21-35	0.133	150	0.200	35
Oats	Ireland	EC	250g/l	foliar	2				0.250	
Oats	Ireland	SE	133g/l	foliar	2				0.200	
Oats	Lithuania	EC	250g/l	foliar	1	14-28		150-300	0.250	35
Oats	U.K.	EC	250g/l	foliar	2		0.125	200	0.250	
Oats	U.K.	SE	133g/l	foliar	2		0.100	200	0.200	
Onion	Brazil	EC	250g/l	foliar		10-14		500	0.100	3
Onion	USA	WG	20%	foliar	6	14			0.168	7
Orange	South Africa	EC	250g/l	foliar	2	42	0.003	6000	0.150	82
Orange	USA	EC	250g/l	foliar	4	10-21			0.274	14
Papaya	Brazil	EC	250g/l	foliar	4	10-14	0.010	1000	0.100	7
Parsley	USA	WG	20%	foliar	3	7-14			0.224	0
Parsnip, Turnip	USA	WG	20%	foliar	3	7-14			0.224	0
Peach, Nectarine	USA	WG	20%	foliar	5	7-14			0.133	0
Peanut	Argentina	SE	133g/l	foliar	2	28	0.050	200	0.100	30
Peanut	Brazil	EC	250g/l	foliar	2	14-18	0.038	400	0.150	14
Peanut	Brazil	SE	133g/l	foliar	2	14-18	0.020	400	0.080	14
Peanut	USA	EC	250g/l	foliar	5	14-21			0.274	14
Pea field dry	Canada	EC	250g/l	foliar	2	10-14	0.100	100	0.100	30
Pecan	USA	WG	20%	foliar	4	7-21			0.133	14
Pepper red	Korea	WG	6.3%	foliar	3	10	0.006	1500	0.095	7
Pepper red	Brazil	EC	250g/l	foliar	3	10	0.01	500-1000	0.100	3
Pistachio	USA	WG	20%	foliar	4	10-30			0.224	14
Plum	USA	WG	20%	foliar	5	7-14			0.133	0
Potato	Brazil	EC	250g/l	foliar	5	10-14	0.013	800	0.100	3
Potato	Brazil	WG	5%	foliar	5	7		500	0.07-0.15	3
Potato	Chile	EC	250g/l	foliar	2	10-14	0.033	300	0.100	3
Potato	USA	EC	250g/l	foliar	6	7-14			0.219	3
Potato Sweet	USA	EC	250g/l	foliar	6	7-14			0.219	3
Potato	Canada	EC	250g/l	foliar	6	7-14	0.66-0.112	200	0.112-0.225	3
Prune	USA	WG	20%	foliar	5	7-14			0.133	0
Pumpkin	USA	WG	20%	foliar	4	7-14			0.224	0
Radish	USA	WG	20%	foliar	3	7-14			0.224	0
Raspberry	USA	WG	20%	foliar	4	7-14			0.196	0

Crop	Country	Formulation		Application						PHI
		Type	Conc	Method	nb	Inter d	Rate kg/hl	Water l/ha	Rate kg ai/ha	days
Rice	Colombia	SE	133g/l	foliar					0.188	
Root vegetables	Canada	WG	20%	foliar	3	7-14	0.05-0.1	225	0.112-0.224	3
Rutabaga	USA	WG	20%	foliar	3	7-14			0.224	0
Rye	Canada	EC	250g/l	foliar	2	10-14	0.1-0.15	100	0.1-0.15	
Rye	France	SE	133g/l	foliar	2	21-35	0.133	150	0.200	35
Rye	Germany	EC	250g/l	foliar	2		0.125	200-400	0.250	35
Rye	Germany	SE	133g/l	foliar	2		0.115	200-400	0.233	35
Rye	Lithuania	EC	250g/l	foliar	1			150-300	0.250	35
Rye	Switzerland	SE	133g/l	foliar	1				0.233	35
Rye	USA	EC	250g/l	foliar	2	10-14			0.224	40
Shallot	USA	WG	20%	foliar	6	14			0.168	7
Soya bean	Argentina	EC	250g/l	foliar	1		0.025	200	0.050	15
Soya bean	Brazil	EC	250g/l	foliar	2	15	0.025	300	0.075	14
Soya bean	Brazil	SE	133g/l	foliar	2	15-20	0.027	300	0.080	14
Soya bean	Paraguay	EC	250g/l	foliar	1		0.025	200	0.050	30
Soya bean	Paraguay	SE	133g/l	foliar	1			100	0.067	30
Spelt	Belgium	SE	133g/l	foliar	2		0.100	200	0.200	
Spelt	Luxembourg	SE	133g/l	foliar	2		0.100	200	0.200	
Squash, Summer	USA	WG	20%	foliar	4	7-14			0.224	0
Squash, winter	USA	WG	20%	foliar	4	7-14			0.224	0
Stone fruit	Canada	WG	20%	foliar	5	7-14	0.013	1000	0.134	10
Strawberry	Canada	WG	20%	foliar	5	7-14	0.05-0.1	1000	0.112-0.2	1
Strawberry	USA	WG	20%	foliar	5	7-14			0.196	0
Sugar beet	USA	EC	250g/l	foliar	4	14			0.219	7
Tangelo, Tangerine	USA	EC	250g/l	foliar	4	10-21			0.274	14
Tomato	Brazil	EC	250g/l	foliar	5	7-14	0.010	1000	0.100	1
Tomato	Brazil	WG	5%	foliar	5	7		1000	0.1-0.2	3
Tomato	Chile	EC	250g/l	foliar	2	10-14	0.033	300	0.100	1
Tomato	USA	WG	20%	foliar	6	7-14			0.224	0
Triticale	Denmark	EC	250g/l	foliar	2	14-28		150-300	0.250	42
Triticale	Estonia	SE	133g/l	foliar	1	14-28		150-300	0.133	35
Triticale	France	SE	133g/l	foliar	2	21-35	0.133	150	0.200	35
Triticale	Germany	EC	250g/l	foliar	2		0.125	200-400	0.250	35
Triticale	Germany	SE	133g/l	foliar	2		0.115	200-400	0.233	35
Triticale	Switzerland	SE	133g/l	foliar	1				0.233	35
Walnut	USA	WG	20%	foliar	4	7-28			0.133	14
Watermelon	USA	WG	20%	foliar	4	7-14			0.224	0
Wheat	Argentina	SE	133g/l	foliar	1		0.067	200	0.133	38
Wheat	Canada	EC	250g/l	foliar	2	10-14	0.1-0.15	100	0.1-0.15	
Wheat	Estonia	SE	133g/l	foliar	1/2	14-28		150-300	0.200 /0.100	35
Wheat	France	SE	133g/l	foliar	2	21-35	0.133	150	0.200	35
Wheat	Latvia	SE	133g/l	foliar	2	14-28		150-300	0.200	35
Wheat	USA	EC	250g/l	foliar	2	10-14			0.224	40
Wheat. soft	Belgium	SE	133g/l	foliar	2		0.100	200	0.200	
Wheat soft	Brazil	EC	250g/l	foliar	2	15	0.100	200	0.200	30
Wheat. soft	Brazil	SE	133g/l	foliar	2	15	0.05-0.067	200	0.1-0.133	30
Wheat soft	Denmark	EC	250g/l	foliar	2	14-28		150-300	0.250	35
Wheat. soft	Germany	EC	250g/l	foliar	2		0.125	200-400	0.250	35
Wheat soft	Germany	SE	133g/l	foliar	2		0.115	200-400	0.233	35
Wheat. soft	Switzerland	SE	133g/l	foliar	1				0.233	35
Wheat soft	UK	EC	250g/l	foliar	2		0.125	200	0.250	
Wheat. spring	Ireland	EC	250g/l	foliar	2				0.250	
Wheat spring	Ireland	SE	133g/l	foliar	2				0.200	
Wheat. spring	Luxembourg	SE	133g/l	foliar	2		0.100	200	0.200	
Wheat. spring	UK	SE	133g/l	foliar	2		0.100	200	0.200	
Wheat. winter	Lithuania	SE	133g/l	foliar	2	14-28		150-300	0.133	35
Wheat. winter	Lithuania	SE	133g/l	foliar	1			150-300	0.200	35
Wheat. winter	Luxembourg	SE	133g/l	foliar	2		0.100	200	0.200	
Wheat. winter	UK	SE	114g/l	foliar	2		0.100	200	0.200	
Yam	USA	EC	250g/l	foliar	6	7-14			0.219	3

RESIDUES RESULTING FROM SUPERVISED TRIALS

The Meeting received information on supervised trials for the following crops

Citrus	Table 45 orange, Table 46 grapefruit and Table 47 lemons
Nuts	Table 48 (almond, pecan and pistachio)
Pome fruits	Table 49 (apples)
Stone fruits	Table 50 cherries, Table 51 peaches and Table 52 plums
Grapes	Table 53
Strawberries	Table 54
Small berries	Table 55 raspberries, Table 56 blueberries
Tropical fruits	Table 57 bananas, Table 58 papaya and Table 59 mangoes
Tuber vegetables	Table 60 carrots, Table 61 radishes and Table 62 sugar beet
Bulb vegetable	Table 63 (garlic, onions)
Solanaceae	Table 64 tomatoes, Table 65 red peppers
Cucurbits	Table 66 squash summer and Table 67 cucumbers
Lettuces	Table 68 lettuce
Beans, peas	Table 69 beans, Table 70 lentils and Table 71 dry peas
Oilseed	Table 72 peanut and Table 73 soya bean
Potatoes	Table 74
Cereal grain	Table 75 oats, Table 76 wheat, Table 77 barley, Table 78 Rye, Table 79 maize
Coffee	Table 80
Sugar beet top	Table 81
Vines and hay	Table 82 peas and Table 83 peanut
Cereal straw, fodder	Table 84 wheat straw and hay, Table 85 barley straw and hay,Table 86 rye straw
Hulls	Table 87 almond hulls

Trials were well documented. The residues of the parent compound and the metabolite 500M07 were measured and reported separately. Laboratory reports included method validation and recoveries with spiking at residue levels. Dates of analysis or periods before analysis were reported.

When residues were not detected they are shown as below the LOQ (e.g. <0.01). Residues, application rates and spray concentrations have generally been rounded to two significant figures or, for residues near the LOQ to one significant figure. Residue values from the trials conducted according to maximum GAP have been used for the estimation of maximum residue level. These results are double-underlined.

Table 45. Pyraclostrobin residues in oranges from supervised trials in the USA and Argentina.

Location	Appl. per treatment			No of tr. Date last treat	Growth stage at last tr.	Portion analysed	residues			PHI days	trials nos. method
	kg as/ha	Water L/ha	kg as/hl				mg/kg parent	mg/kg 500M07	total		
AR Corrientes F/00/847 AR2/01	0.075	1000	0.008	4 21/01/00	fruit		0.12	<0.02	0.14	1	#2001/1015024
							0.19	<0.02	0.21	10	
							0.14	<0.02	0.16	20	
							0.07	<0.02	0.09	40	
USA Florida Clermont	0.168 to 0.280	710	0.024 to 0.039	4 22/04/99		orange whole	0.17	0.06	0.23	14	# 1999/5144 421/0 (g)
USA Florida Loxahatch.	0.168 to 0.280	1325	0.013 to 0.021	4 06/05/99	Mature	orange whole	0.37	0.07	0.44	14	# 1999/5144 421/0 (g)
USA Florida Immokale.	0.168 to 0.280	634	0.026 to 0.044	4 22/04/99	Mature	orange whole	0.51	0.07	0.58	14	# 1999/5144 421/0 (g)
USA Florida Immokalee	0.168 to 0.280	1419	0.012 to 0.020	4 22/04/99	Mature	orange whole	0.35	0.04	0.39	14	# 1999/5144 421/0 (g)
USA Florida Loxahatchee.	0.168 to	653	0.026 to	4 07/05/99	Fruit 3" Diameter	orange whole	0.24	0.08	0.32	14	# 1999/5144 421/0 (g)

Location	Appl. per treatment			No of tr. Date last treat	Growth stage at last tr.	Portion analysed	residues			PHI days	trials nos. method
	kg as/ha	Water L/ha	kg as/hl				mg/kg parent	mg/kg 500M07	total		
	0.280		0.043								
USA Florida Immokalee	0.168 to 0.280	1287	0.013 to 0.022	4 22/04/99	Mature	orange whole	0.34	0.05	0.39	14	# 1999/5144 421/0 (g)
USA . Florida Hobe Sound	0.168 to 0.280	625	0.027 to 0.045	4 18/04/99	3" diameter	orange whole	0.26	0.10	0.36	14	# 1999/5144 421/0 (g)
USA Florida Oviedo	0.168 to 0.280	2176	0.008 to 0.013	4 21/05/99		orange whole	0.17	0.05	0.22	14	# 1999/5144 421/0 (g)
USA Raymon dille.Willacy. Texas (99291)	0.168 to 0.280	2412	0.007 to 0.012	4 15/10/99	Medium -large	Orange w.	0.23	0.02	0.25	14	# 1999/5144 421/0 (g)
						orange peel	0.47	0.04	0.51	14	
						orange pulp	< 0.02	< 0.02	< 0.04	14	
USA California Ducor. Tulare Co.. (99292)	0.168 to 0.280	710	0.024 to 0.039	4 03/12/99	near maturity	Orange w.	0.13	< 0.02	0.15	14	# 1999/5144 421/0 (g)
						orange peel	0.40	< 0.02	0.42	14	
						orange pulp	< 0.02	< 0.02	< 0.04	14	
USA Tulare Strathmore .California (99293)	0.168 to 0.280	3310	0.005 to 0.008	4 24/11/99	near maturity	Orange w.	0.25	< 0.02	0.27	14	# 1999/5144 421/0 (g)
						orange peel	0.48	< 0.02	0.50	14	
						orange pulp	< 0.02	< 0.02	< 0.04	14	
USA California Richgrove Kern Co.. 99294)	0.168 to 0.280	710	0.024 to 0.039	4 18/11/99	near maturity	orange w.	0.12	< 0.02	0.14	14	# 1999/5144 421/0 (g)
						orange peel	0.19	< 0.02	0.21	14	
						orange pulp	< 0.02	< 0.02	< 0.04	14	
USA California Porterville. Tulare Co.. (99306)	0.168 to 0.280	3311	0.005 to 0.008	4 13/12/99	near maturity	orange w.	0.18	< 0.02	0.20	14	# 1999/5144 421/0 (g)
						orange peel	0.30	< 0.02	0.32	14	
						orange pulp	< 0.02	< 0.02	< 0.04	14	

Table 46. Pyraclostrobin residues in grapefruit from supervised trials in the USA.

Location	Appl. per treatment			No of tr Date last tr..	Growth stage at last tr.	Portion analysed	residues			PHI days	trials number Method
	kg as/ha	Water L/ha	kg as/hl				mg/kg parent	residues mg/kg 500M07	total		
Mims. Florida	0.168 to 0.280	2762	0.006 to 0.010	4 22/04/99		whole grapefruit	0.12	< 0.02	0.14	14	# 1999/5144 421/0
Loxaha tchee Florida	0.168 to 0.280	625	0.027 to 0.045	4 07/05/99	4-6" Diameter	whole grapefruit	0.19	< 0.02	0.21	14	# 1999/5144 421/0
Loxahatchee. Florida	0.168 to 0.280	1353	0.012 to 0.021	4 06/05/99	Mature	whole grapefruit	0.24	0.03	0.27	14	# 1999/5144 421/0
Raymondville Texas	0.168 to 0.280	710	0.024 to 0.039	4 15/10/99	Large fruit	whole. grapefruit	0.07	< 0.02	0.09	14	# 1999/5144 421/0
Porterville. California	0.168 to 0.280	2318	0.007 to 0.012	4 22/11/99	Fruit 5-6"	whole grapefruit	0.08	< 0.02	0.10	14	# 1999/5144 421/0
Porterville. Tulare Co.. California (rcn 99300)	0.168 to 0.280	662	0.025 to 0.042	4 03/12/99	fruit 6-8"	grapefruit	0.11	< 0.02	0.13	14	# 1999/5144 421/0
						grapefruit. peel	0.11	< 0.02	0.13	14	
						grapefruit. pulp	< 0.02	< 0.02	< 0.04	14	

Table 47. Pyraclostrobin residues in lemons from supervised trials in the USA, Argentina and Brazil.

Location	Appl. per treatment				Growth stage at last tr.	Residues				PHI days	trials number Method
	kg as/ha	Water L/ha	kg as/hl	No of tr Date last treat.		Portion analysed	mg/kg parent	mg/kg 500M 07	Total		
USA Clewiston California.	0.168 to 0.280	615	0.027 to 0.046	4 23/04/99		whole lemon	0.19	0.04	0.23	14	# 1999/5144 421/0
USA Porterville. California	0.168 to 0.280	690	0.024 to 0.041	4 04/11/99	Immature fruit	whole lemon	0.15	< 0.02	0.17	14	# 1999/5144 421/0
USA Ducor .California	0.168to 0.280	1920	0.009 to 0.015	4 10/11/99	near maturity	whole lemon	0.20	< 0.02	0.22	14	# 1999/5144 421/0
USA Somis California	0.168 to 0.280	1892 1892	0.009 to 0.015	4 01/10/99	Crop sizing	whole lemon	0.28	0.04	0.32	14	# 1999/5144
USA Porterville. California	0.168 to 0.280	852	0.020 to 0.033	4 28/04/99	90-95% mature	whole lemon	0.32	0.05	0.37	14	# 1999/5144 421/0
BR/BRU 2000/100	0.200	2000	0.010	2 28/01/00	Ripping	fruit	<0.02	<0.02	<0.04	0	#2001/5002342 D9908
							<0.02	<0.02	<0.04	7	
							<0.02	<0.02	<0.04	14	
							<0.02	<0.02	<0.04	21	
							<0.02	<0.02	<0.04	28	
BR /BRU 2000/099	0.200	2000	0.010	2 28/01/00	Ripping	fruit	0.14	0.02	0.16	14	#2001/5002342 D9908
	0.400	2000	0.020				0.21	0.03	0.23	14	
BR Plantec 2000/101	0.200	2024	0.099	2 29/04/00	84	fruit	0.10	0.02	0.12	14	#2001/5002342 D9908
	0.400	2024	0.198				0.19	0.03	0.22	14	
BR /BRU 2000/102	0.200	2000	0.010	2 29/03/00	ripening	fruit	0.10	0.02	0.12	14	#2001/5002342 D9908
	0.400	2000	0.020				0.19	0.03	0.22	14	
AR Tucuman F/01/854 ARX/06/01	0.075	1000	0.008	4 18/02/01		fruit	0.33	<0.02	0.35	1	#2001/1015023 445/0
							0.11	<0.02	0.13	40	
							0.12	<0.02	0.14	90	
AR Tucuman F/00/849 AR1/01	0.075	1000	0.008	4 01/03/00		fruit	0.23	0.02	0.25	1	#2001/1015025 445/0
							0.10	<0.02	0.12	10	
							<0.02	<0.02	<0.04	20	
							0.13	<0.02	0.15	40	
							0.12	<0.02	0.14	92	

Table 48. Pyraclostrobin residues in nuts from supervised trials in the USA.

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number method
	kg as/ha	Water L/ha	kg as/hl	No of tr.			mg/kg parent	residues mg/kg 500M07	total		
1. Almonds											
Terra Bella Tulare Co California	0.134 0.134	804 2034	0.017 0.007	4 4	Mature	kernels kernels	≤ 0.02 ≤ 0.02	< 0.02 < 0.02	< 0.04 < 0.04	148 148	# 1999/5161 421/0 (g)
Bakersfield, Kern Co , California	0.134 0.134	728 1890	0.018 0.007	4 4	Fruit set	kernels	≤ 0.02 ≤ 0.02	< 0.02 < 0.02	< 0.04 < 0.04	108 108	# 1999/5161 421/0 (g)
Fresno Co., California	0.134 0.134	927 2365	0.014 0.006	4 4	Small nuts	kernels	≤ 0.02 ≤ 0.02	< 0.02 < 0.02	< 0.04 < 0.04	116 116	# 1999/5161 421/0 (g)
Chico, Butte Co., California	0.134	662	0.020	4	Appr. 5 weeks after petal fall	kernels	≤ 0.02 <0.02 < 0.02 <0.02 <0.02	< 0.02 <0.02 <0.02 <0.02 <0.02	< 0.04 <0.04 <0.04 <0.04 <0.04	120 127 134 141 148	# 1999/5161 421/0 (g)
Chico, Butte Co., California	0.134	1514	0.009	4	Appr. 5 weeks after petal fall	kernels	≤ 0.02	< 0.02	< 0.04	120	# 1999/5161 421/0 (g)
							< 0.02	< 0.02	< 0.04	127	
							< 0.02	< 0.02	< 0.04	134	
							< 0.02	< 0.02	< 0.04	141	
Madera Co., California	0.134 0.134	946 2365	0.014 0.006	4	Small nuts	kernels	≤ 0.02 ≤ 0.02	< 0.02 < 0.02	< 0.04 < 0.04	115 115	# 1999/5161 421/0 (g)

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number method
	kg as/ha	Water L/ha	kg as/hl	No of tr.			mg/kg parent	residues mg/kg 500M07	total		
2. Pecans											
	Appl. per treatment						Residues				trials number
Winterville. Clark Co. Georgia	0.134	728	0.018	4	12-22 days to maturity	kernels	< 0.02	< 0.02	< 0.04	14	# 1999/5152 421/0 (g)
	0.134	1703	0.008	4		kernels	< 0.02	< 0.02	< 0.04	14	
Chula. Tift Co..Georgia	0.134	814	0.016	4	early shuck split	kernels	< 0.02	< 0.02	< 0.04	14	# 1999/5152 4210(g)
	0.134	1845	0.007	4			< 0.02	< 0.02	< 0.04	14	
Pumpkin Center.Stephens Co. Oklahoma	0.134	611	0.022	4	Mature/ most trees shuck split	kernels	< 0.02	< 0.02	< 0.04	14	# 1999/5152 421/0 (g)
	0.134	1372	0.010	4			< 0.02	< 0.02	< 0.04	14	
Manitou. Tillman Co. Oklahoma	0.134	696	0.019	4	Mature/ 2/3 trees shuck split	kernels	< 0.02	< 0.02	< 0.04	14	# 1999/5152 421/0 (g)
	0.134	1598	0.008	4			< 0.02	< 0.02	< 0.04	14	
Cary sharkey Mississsipi	0.134	620	0.022	4	Cracking maturing	kernels	< 0.02	< 0.02	< 0.04	14	# 1999/5152 421/0 (g)
	0.134	1307	0.010	4			< 0.02	< 0.02	< 0.04	14	
Pistachio											
Orlando. California	0.224	620	0.036	4	Pistachio	kernels	0.16	< 0.02	0.18	14	# 1999/5150 421/0 (g)
	0.224	1513	0.015	4			0.27	< 0.02	0.29	14	
Chico Butte Co.California	0.224	573	0.039	4	Pistachio ripening	kernels	0.44	< 0.02	0.46	14	# 1999/5150 421/0 (g)
	0.224	1363	0.016	4			0.45	0.03	0.48	14	
Kerman fresno, california	0.224	949	0.024	4	Fruit not fully split	kernels	< 0.02	< 0.02	< 0.04	14	# 1999/5150 421/0 (g)
	0;224	1870	0.012	4			< 0.02	< 0.02	< 0.04	14	

Table 49. Pyraclostrobin residues in apples from supervised trials in Brazil.

Location	Appl. per treatment				Growth stage	Portion analysed	Residues			PHI days	trials method
	kg as/ha	Water L/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	Total		
Santagro 2000/049	0.150	1000	0.015	4	72	apples	0.34	0.08	0.42	14	#2000/5241 D9908
	0.300	1000	0.030	03/02/00			1.00	0.19	1.19	14	
Santagro 2000/905	0.150	1000	0.015	4	72	apples	0.35	0.09	0.44	14	#2000/5241 D9908
	0.300	1000	0.030	03/02/00		apples	0.93	0.21	1.14	14	
Fitopesquisa 2000/050	0.150	1000	0.015	4 10/03/00	ripening	apples	0.16	0.02	0.18	0	#2000/5241 D9908
							0.19	0.05	0.24	7	
							0.15	0.03	0.18	14	
Fitopesquisa 2000/050							0.11	<0.02	0.13	21	
							0.04	<0.02	0.06	28	
							<0.02	<0.02	<0.04	35	
BR5 2000/051	0.150	1000	0.015	4	colored fruits	apples	0.11	0.04	0.16	14	#2000/5241 D9908
	0.300	1000	0.030	18/02/00			0.30	0.11	0.41	14	
BR5 2000/052	0.150	1000	0.015	4	colored fruits	apples	0.06	0.02	0.08	14	#2001/500242 D9908
	0.300	1000	0.030	18/02/00			0.09	0.03	0.12	14	
Fitopesquisa CDR/F 2000/053	0.150	1000	0.015	4 10/03/00	ripening	apples	<0.02	<0.02	<0.04	0	#2001/500242 D9908
							0.12	<0.02	0.14	7	
							0.14	<0.02	0.16	14	
							0.03	<0.02	0.05	21	
							0.04	<0.02	0.06	28	
							0.04	<0.02	0.06	35	
Santagro 2000/054	0.150	1000	0.015	4	87	apple	0.38	0.05	0.43	14	#2001/5002427 D9908
	0.300	1000	0.030	03/02/00			0.94	0.07	1.01	14	
Santagro 2000/906	0.150	1000	0.015	4	87	apple	0.25	0.05	0.30	14	#2001/5002427 D9908
	0.300	1000	0.030	03/02/00			0.57	0.08	0.65	14	

Table 50. Pyraclostrobin residues in cherries sour from supervised trials in the USA.

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number method
	kg ai/ha	Water L/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	Total		
North Rose, New York	0.134	760	0.018	5	Harvest	fruit	0.48	0.04	0.52	0	# 1999/5146 421/0 (g)
	0.134	1425	0.009	5	Harvest	fruit	0.51	0.05	0.55	0	
Conklin, Michigan	0.134	613	0.022	5	Mature	fruit	0.50	0.03	0.53	0	# 1999/5146 421/0 (g)
	0.134	1820	0.007	5	Mature	fruit	0.63	0.03	0.67	0	
Conklin, Michigan	0.134	705	0.019	5	Mature fruit	fruit	0.25	0.02	0.27	0	# 1999/5146 421/0 (g)
	0.134	2014	0.007	5	Mature fruit	fruit	0.27	< 0.02	0.29	0	
Casnovia, Michigan	0.134	617	0.022	5	Mature	fruit	0.43	0.03	0.46	0	# 1999/5146 421/0 (g)
	0.134	1835	0.007	5	Mature	fruit	0.50	0.02	0.52	0	
Poplar, California	0.134	597	0.022	5	Mature	fruit	0.25	< 0.02	0.27	0	# 1999/5146 421/0 (g)
	0.134	2354	0.006	5	Mature	fruit	0.38	< 0.02	0.40	0	
Ephrata, Washington	0.134	473	0.028	5	Mature	fruit	0.42	< 0.02	0.44	0	# 1999/5146 421/0 (g)
	0.134	1910	0.007	5	Mature	fruit	0.34	< 0.02	0.36	0	

Table 51. Pyraclostrobin residues in peaches from supervised trials in the USA.

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	residues			PHI days	trials number method
	kg ai/ha	Water L/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
Hereford, Pennsylvania	0.134	514	0.026	5	Ripe	peach	0.26	< 0.02	0.28	0	# 1999/5146 421/0 (g)
	0.134	2032	0.007	5	Ripe	peach	0.28	< 0.02	0.30	0	
Monetta, S Carolina	0.134	489	0.027	5	Mature fruit	peach	0.07	< 0.02	0.09	0	# 1999/5146 421/0 (g)
	0.134	1983	0.007	5	Mature fruit	peach	0.08	< 0.02	0.10	0	
Winterville, Georgia	0.134	656	0.020	5	Mature fruit	peach	0.15	< 0.02	0.17	0	# 1999/5146 421/0 (g)
	0.134	1349	0.010	5	Mature fruit	peach	0.14	< 0.02	0.16	0	
Conklin, Michigan	0.134	630	0.021	5	Mature fruit	peach	0.15	< 0.02	0.17	0	# 1999/5146 421/0 (g)
	0.134	1847	0.007	5	Mature fruit	peach	0.13	< 0.02	0.15	0	
Vernon, Texas	0.134	589	0.023	5	Mature fruit	peach	0.23	< 0.02	0.25	0	# 1999/5146 421/0 (g)
	0.134	1247	0.011	5	Mature fruit	peach	0.31	< 0.02	0.33	0	
Porterville, California	0.134	701	0.019	5	Immature fruit	peach	0.16	< 0.02	0.18	0	# 1999/5146 421/0 (g)
	0.134	2571	0.005	5	Immature fruit	peach	0.10	< 0.02	0.12	0	
Selma, California	0.134	950	0.014	5	Mature	peach	0.16	< 0.02	0.18	0	# 1999/5146 421/0 (g)
	0.134	1896	0.007	5	Mature	peach	0.08	< 0.02	0.10	0	
Gridley California	0.134	530	0.025	5	Mature	Peach	0.11	< 0.02	0.13	0	# 1999/5146 421/0 (g)
	0.134	1253	0.011	5	Mature	Peach	0.10	< 0.02	0.12	0	
USA Tifton, Georgia	0.134	510	0.026	5	1¾ - 2½’’	peach	0.21	< 0.02	0.23	0	# 1999/5146 421/0 (g)
							0.12	< 0.02	0.14	7	
							0.08	< 0.02	0.10	14	
							0.06	< 0.02	0.08	21	
							0.07	< 0.02	0.09	28	
USA Tifton, Georgia	0.134	2545	0.005	5	1¾ - 2½’’	peach	0.20	< 0.02	0.22	0	# 1999/5146 421/0 (g)
							0.07	< 0.02	0.09	7	
							0.08	< 0.02	0.10	14	
							0.06	< 0.02	0.08	21	
							0.11	< 0.02	0.13	28	

Table 52. Pyraclostrobin residues in plums from supervised trials in the USA.

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number Method
	kg ai/ha	Water L/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
Conklin. Ottawa Co.. Michigan (rcn99116)	0.134	727	0.018	5	Early maturity	plum	0.19	< 0.02	0.21	0	# 1999/5146 421/0 (g)
							0.15	< 0.02	0.17	7	
							0.09	< 0.02	0.11	14	
							0.06	< 0.02	0.08	21	
							0.06	< 0.02	0.08	28	
	0.134	2154	0.006	5	Early maturity	plum	0.13	< 0.02	0.15	0	# 1999/5146 421/0 (g)
							0.05	< 0.02	0.07	7	

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number Method
	kg ai/ha	Water L/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
							0.07	< 0.02	0.09	14	
							0.05	< 0.02	0.07	21	
							0.07	< 0.02	0.09	28	
Porterville.	0.134	533	0.025	5	Maturity	plum	0.04	< 0.02	0.06	0	# 1999/5146
California	0.134	2084	0.006	5			0.05	< 0.02	0.07	0	421/0 (g)
Porterville.	0.134	556	0.024	5	Fruit	plum	0.06	< 0.02	0.08	0	# 1999/5146
Tulare Co..	0.134	2310	0.006	5	maturation		0.12	< 0.02	0.14	0	421/0 (g)
California											
Chico.	0.134	861	0.016	5	Mature	plum	0.02	< 0.02	0.04	0	# 1999/5146
California	0.134	1646	0.008	5			0.02	< 0.02	0.04	0	421/0 (g)
Selma.	0.134	960	0.014	5	Mature	plum	0.06	< 0.02	0.08	0	# 1999/5146
California	0.134	1896	0.007	5			0.06	< 0.02	0.08	0	421/0 (g)
Dallas.	0.134	608	0.022	5	Mature	plum	0.03	< 0.02	0.05	0	# 1999/5146
Oregon	0.134	1787	0.007	5			0.04	< 0.02	0.06	0	421/0 (g)

Table 53. Pyraclostrobin residues in grapes from supervised trials in Brazil, Europe and the USA.

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number method
	kg ai/ha	Water L/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
D – 69168	0.06	300	0.02	8	81	grapes	0.72	0.03	0.75	0	# 1999/10980
Wiesloch	to	to			02/09/97		0.67	0.07	0.74	35	421/0
DU2/04/97)	0.16	800					0.81	0.08	0.89	42	
							0.82	0.06	0.88	49	
							0.47	0.03	0.50	56	
D – 67269	0.06	300	0.02	8	81	grapes	0.99	0.04	1.03	0	# 1999/10980
Grünstadt	to	to			04/09/97		0.40	0.04	0.44	35	421/0
DU3/02/97	0.16	800					0.43	0.04	0.46	42	
							0.48	0.05	0.53	49	
							0.46	0.04	0.49	56	
D – 67269	0.06	300	0.02	8	79	grapes	0.88	0.04	0.92	0	# 1999/10980
Grünstadt	to	to			14/08/97		0.25	0.02	0.27	35	421/0
DU3/05/97)	0.16	800					<0.02	< 0.02	< 0.04	42	
							0.24	< 0.02	0.26	49	
							0.23	0.02	0.25	56	
D - 53474	0.06	300	0.02	8	81	grapes	2.01	0.12	2.13	0	# 1999/10981
Bad Neuenahr-	to	to			25/08/98		0.44	0.08	0.52	35	421/0
Ahrweiler	0.160	800					0.54	0.11	0.65	42	
(Agr/03/98)							0.57	0.09	0.66	49	
							0.55	0.09	0.64	56	
D – 69168	0.06	300	0.02	8	83	grapes	0.68	0.06	0.74	0	# 1999/10981
Wiesloch	to	to			01/09/98		0.75	0.12	0.87	35	421/0
DU2/07/98	0.160	800					0.84	0.11	0.95	42	
							0.74	0.09	0.83	49	
							0.61	0.07	0.68	56	
D – 67269	0.06	300	0.02	8	83	grapes	0.75	0.04	0.80	0	# 1999/10981
Grünstadt	to	to			08/09/98		0.64	0.08	0.72	35	421/0
DU3/05/98	0.160	800					0.58	0.06	0.64	42	
							0.89	0.08	0.97	49	
							0.77	0.07	0.84	56	
D – 69168	0.06	300	0.02	8	83	grapes	0.96	0.09	1.05	0	# 1999/10982
Wiesloch	to	to			01/09/98		0.74	0.07	0.81	35	421/0
DU2/02/98	0.16	800									
D – 69168	0.06	300	0.02	8	81-83	grapes	0.62	0.04	0.65	0	# 1999/10982
Wiesloch	to	to			08/09/98		0.76	0.04	0.80	35	421/0
DU2/03/98	0.16	800									
D – 67269	0.06	300	0.02	8	81	grapes	0.73	0.11	0.84	0	# 1999/10982
Grünstadt	to	to			18/08/98		0.78	0.14	0.93	35	421/0
DU3/02/98	0.16	800									
D-53474	0.16	800	0.02	3	83	Grapes	1.74	0.09	1.83	0	2002/1010480
Ahrweiler					1/8/ 01		1.22	0.12	1.34	14	445/0
Waldporz-							1.33	0.15	1.48	21	
Heimerstraße							1.08	0.12	1.20	28	
AGR/33/01							1.15	0.15	1.30	34	

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number method
	kg ai/ha	Water L/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
D-54518 Kesten. AGR/34/01 Rheinland- Pfalz	0.16	800	0.02	3	83 1/8/ 01	Grapes	2.04	0.12	2.16	0	2002/1010480 445/0
							1.37	0.14	1.51	14	
							1.58	0.21	1.80	21	
							1.00	0.16	1.16	28	
							1.27	0.16	1.45	34	
D-69168 Wiesloch	0.11	550	0.02	6	89 30/8/00	Grapes	0.45	0.07	0.52	35	#2002/1008790 445/0
D-67157 Wachenheim	0.11	550	0.02	6	89 24/8/00	Grapes	0.33	0.03	0.36	35	#2002/1008790 445/0
D-53474 Ahrweiler. Waldporz- Rheinland-Pfalz	0.16	800	0.02	3	83 1/8/01	Grapes	1.16	0.02	1.18	0	2002/1010480 445/0
							0.71	0.05	0.76	14	
							0.58	0.06	0.63	21	
							0.45	0.06	0.51	28	
							0.47	0.05	0.52	34	
D-54518 Kesten Rheinland-Pfalz AGR/34/01	0.16	800	0.02	3	83 1/8/01	Grapes	1.47	0.05	1.52	0	2002/1010480 445/0
							0.81	0.06	0.87	14	
							0.77	0.07	0.84	21	
							0.68	0.07	0.75	28	
							0.78	0.08	0.86	34	
D – 67269 Grünstadt DU3/03/98	0.06 to 0.16	300 to 800	0.02	8	81 18/08/98	grapes	0.43	0.06	0.49	0	# 1999/10982 421/0
							0.36	0.04	0.39	35	
F - 21420 Pernand(North) Vergelesses (FR4/04/97)	0.06 to 0.16	300 to 800	0.02	8	79 – 81 05/08/97	Grapes	0.84	0.04	0.88	0	# 1999/10980
							0.41	0.03	0.44	35	
							0.78	0.07	0.85	42	
							0.28	0.03	0.31	49	
							0.32	0.02	0.34	55	
F - 21420 Pernand(North) Vergelesses FR4/01/98	0.06 to 0.16	300 to 800	0.02	8	81 06/08/98	Grapes	0.60	0.04	0.64	0	# 1999/10981
							0.17	0.03	0.20	35	
							0.18	0.03	0.21	42	
							0.18	0.03	0.21	48	
							0.19	0.03	0.22	55	
F - 30350 Aigremont (FR3/03/97) South	0.06 to 0.16	300 to 800	0.02	8	81 12/08/97	Grapes	0.42	0.02	0.44	0	# 1999/10980
							0.20	< 0.02	0.22	35	
							0.15	< 0.02	0.17	42	
							0.19	< 0.02	0.21	48	
							0.21	< 0.02	0.23	57	
F - 30350 Aigremont (FR3/01/98) South	0.06 to 0.16	300 to 800	0.02	8	81 11/08/98	Grapes	0.78	0.03	0.81	0	# 1999/10981
							0.42	0.03	0.45	35	
							0.59	0.05	0.64	42	
							0.41	0.03	0.44	49	
							0.42	0.05	0.47	56	
F - 31620 Fronton FR8/01/98 (South)	0.060 to 0.160	300 to 800	0.020	8	83 19/08/98	Grapes	0.47	0.05	0.52	0	# 1999/10981
							0.23	< 0.02	0.25	34	
							0.34	0.04	0.38	41	
							0.32	0.03	0.35	48	
							0.26	< 0.02	0.28	55	
F-67560 ROSHEIM Hitzematt Alsace FAN/03/01	0.160	800	0.020	3	81 26/7/ 01	Grapes	0.51	0.03	0.54	0	2002/1010480 445/0
							0.32	0.03	0.35	15	
							0.38	0.04	0.41	22	
							0.40	0.04	0.44	29	
							0.44	0.05	0.48	35	
F- 67560 ROSHEIM. Hitzematt Alsace FAN/03/01	0.160	800	0.02	3	85 26/7/ 01	Grapes	0.41	<0.02	0.43	0	2002/1010480 445/0
							0.28	0.03	0.31	15	
							0.20	<0.02	0.22	22	
							0.19	<0.02	0.21	29	
							0.26	0.03	0.29	35	
E - 11402 Jerez de La Frontera (AC/06/98)	0.060 to 0.160	300 to 800	0.02	8	79 – 81 28/07/98	Grapes	0.62	0.09	0.71	0	# 1999/10981
							0.17	0.05	0.22	35	
							0.15	0.04	0.19	42	
							0.18	0.04	0.22	49	
							0.13	0.02	0.15	56	
E-41700 Dos Hermanas	0.110	550	0.020	6	85 22/6/00	Grapes	0.28	0.10	0.37	36	#2002/1008790 445/0
E-41710 Utrera	0.110	550	0.020	6	83 9/6/00	Grapes	0.06	0.02	0.09	35	#2002/1008790 445/0

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number method
	kg ai/ha	Water L/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
I-27050 Morinico Losana. Casa Ferrari Pavia	0.160	800	0.020	3	85 3/8/ 01	Grapes	0.35	0.04	0.39	0	2002/1010480 445/0
							0.18	0.03	0.21	14	
							0.19	0.04	0.23	22	
							0.18	0.04	0.22	29	
							0.16	0.04	0.20	35	
I /33/01 I-15050 Costa Vescovato. Montale Celli	0.160	800	0.020	3	85 31/7/ 01	Grapes	1.13	0.07	1.20	0	2002/1010480 445/0
							1.11	0.11	1.22	14	
							0.84	0.10	0.94	21	
							1.04	0.10	1.14	28	
							0.56	0.06	0.62	35	
I-15050 Costa Vescovato. Piemonte ITA/34/01	0.160	800	0.020	3	85 31 /07 01	Grapes	0.81	<0.02	0.83	0	2002/1010480 445/0
							0.80	0.04	0.84	14	
							0.61	0.03	0.64	21	
							0.66	0.04	0.70	28	
							0.59	0.04	0.62	35	
I-27050 Morinico losana. Casa Ferrari Pavia	0.160	800	0.020	3	85 3 /8 01	Grapes	0.27	<0.02	0.29	0	2002/1010480 445/0
							0.17	<0.02	0.19	14	
							0.15	<0.02	0.17	22	
							0.13	<0.02	0.15	29	
							0.13	<0.02	0.15	35	
USA George, Grant Co., Washington (RCN 99133)	0,2	1413	0,014	3	16/09/99	80% mature grapes	0,12	<0,02	0,14	14	1999/5153 means of 2 values
USA Mattawa, Grant Co., Washington (RCN 99132)	0,2	705	0,028	3	23/08/1999		0,09	< 0.02	0,11	14	1995/5145 421/0 (g) means of 2 values
USA Othello Grant county, Washington (RCN 99251)	0,200	1712	0,012	3	02/09/1999		0,35	0,02	0,37	14	# 1999/5145 D9808 means of 2 values
USA Dundee, Yates county, New York (RCN 99252)	0,202	939	0,022	3	02/09/1999	Early maturity	0,67	0,09	0,76	15	# 1999/5145 D9808 means of 2 values
USA Dundee, Yates Co., New York (RCN 99122)	0,200	475	0,042	3	25/08/1999	Early maturity	1,15	0,10	1,25	14	# 1999/5153 421/0 (g)
USA Fresno, Fresno county, California (RCN 99253)	0,200	1396	0,014	3	03/08/1999	Sweet-ening berries	0,49	0,02	0,51	14	# 1999/5145 D9808 means of 2 values
USA Poplar, Tulare Co., California (RCN 99125)	0,200	1449	0,014	3	17/08/1999	90% sugar	0,12	< 0.02	0,14	14	# 1999/5153 421/0 (g)
USA Porterville, Tulare Co., California (RCN 99126)	0,200	746	0,027	3	17/08/1999	90% colour	0,10	< 0.02	0,12	14	# 1999/5153 421/0 (g)
USA Arbuckle, Colusa Co., California (RCN 99127)	0,200	504	0,040	3	23/08/1999	Berry develop-ment	0,55	< 0.02	0,57	14	# 1999/5153
USA Glenn Co., California (RCN 99128)	0,200	1476	0,014	3	17/08/1999	Fruit Develop-ment	0,49	< 0.02	0,51	14	# 1999/5153 421/0 (g)
USA Fresno, Fresno Co., California (RCN 99129)	0,200	702	0,028	3	04/08/1999	Sweet-ening berries	0,22	< 0.02	0,24	14	# 1999/5153 421/0 (g)
USA Fresno, california Fresno Co., California (RCN 99130)	0,200	1402	0,014	3	04/08/1999	Sweet-ening berries	0,43	0,02	0,45	14	# 1999/5153 421/0 (g)
USA Madera,	0,200	1436	0,014	3	04/08/1999	Sweet-	0,24	< 0.02	0,26	14	# 1999/5153

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number method
	kg ai/ha	Water L/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
Madera Co., California (RCN 99131)						ening berries					421/0 (g)
USA Rich Grove Kern Co., California (RCN 99124	0,200	710	0,028	3	07/10/1999	90% colour	0,16	< 0.02	0,18	0	# 1999/5153 421/0 (g)
							0,17	< 0.02	0,19	7	
							0,10	< 0.02	0,12	14	
							0,12	< 0.02	0,14	21	
							0,09	< 0.02	0,11	28	
BR BRU CDR/F 2000/292	0,100						1,06	0,05	1,12	7	#2000/5241 D9908
	0,200						3,05	0,18	3,23	7	
BR BRX CDR/F 2000/291	0,100						0,36	0,04	0,40	7	#2000/5241 D9908
	0,200						0,34	0,05	0,39	7	
BR BRX CDR/F 2000/294	0,100						1,38	0,04	1,42	7	#2000/5241 D9908
	0,200						1,87	0,05	1,92	7	
BR BRX CDR/F 2000/293	0,100						1,09	0,05	1,14	0	#2000/5241 D9908
							0,79	0,07	0,85	7	
							0,49	0,04	0,53	14	
							0,56	0,03	0,59	21	
							0,67	0,02	0,69	28	

Table 54. Pyraclostrobin residues in strawberries from supervised trials in the USA.

Location	Appl. per treatment				Growth stage at last tr. Date	Portion analysed	Residues			PHI days	trials number methods
	kg ai/ha	Water l/ha	kg as/hl	No of tr./date			mg/kg parent	mg/kg 500M07	Total		
Frederick Pennsylvania.	0.20	929	0.022	5	Early maturity 27/5/ 99	Fruit	0.06	< 0.02	0.08	0	# 1999/5140 421/0 (g)
Goldsboro N.Carolina	0.20	234	0.085	5	mature fruit 27/4/ 99	Fruit	0.16	< 0.02	0.18	0	# 1999/5140 421/0 (g)
Melrose Florida.	0.20	386	0.052	5	Fruit 24/4/ 99	fruit	0.19	< 0.02	0.21	0	# 1999/5140 421/0 (g)
Marne. Michigan	0.20	285	0.070	5	Mature fruit 10/6/ 99	fruit	0.10	< 0.02	0.12	0	# 1999/5140 421/0 (g)
Hughson California.	0.20	925	0.022	5	Fruiting 14/05/99	fruit	0.24	< 0.02	0.26	0	# 1999/5140 421/0 (g)
Porterville California.	0.20	289	0.069	5	Maturity 24/05/99	fruit	0.15	< 0.02	0.17	0	# 1999/5140 421/0 (g)
Mt. Angel Oregon.	0.20	478	0.042	5	Mature 16/06/99	fruit	0.13	< 0.02	0.15	1	# 1999/5140 421/0 (g)
Oceanside. California San Diego	0.20	462	0.043	5	Bloom-mature fruit 28/04/99	fruit	0.26	< 0.02	0.28	0	# 1999/5140 421/0 (g)
							0.16	< 0.02	0.18	7	
							0.11	< 0.02	0.13	14	
							0.05	< 0.02	0.07	21	
							0.03	< 0.02	0.05	28	

Table 55. Pyraclostrobin residues in raspberries from supervised trials in the USA.

Location	Appl. per treatment				Growth stage at last tr. date	Portion analysed	Residues			PHI days	Trials number method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
Penn Yau. Yates Co.. New York (rcn 99277)	0.20	570	0.035	4	Mature berries 12/07/99	Fruit	0.78	0.03	0.81	0	# 1999/5143 421/0 (g)
							0.53	0.02	0.55	2	
							0.52	0.03	0.55	4	
							0.41	0.03	0.44	6	
							0.30	< 0.02	0.32	8	

Location	Appl. per treatment				Growth stage at last tr. date	Portion analysed	Residues			PHI days	Trials number method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
Oregon Washington	0.20	546	0.037	4	Mature fruit 07/07/99	Fruit	0.50	< 0.02	0.52	0	# 1999/5143 421/0 (g)
Oregon Washington	0.20	522	0.038	4	Mature fruit 07/07/99	Fruit	0.63	0.03	0.66	0	# 1999/5143 421/0 (g)

Table 56. Pyraclostrobin residues in blueberries from supervised trials in the USA.

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
Wisconsin	0.20	478	0.042	4	85% ripe	Fruit	0.35	0.02	0.37	0	# 1999/5143 421/0 (g)
Corvallis. Oregon	0.20	965	0.021	4	Mature	Fruit	0.19	< 0.02	0.21	0	# 1999/5143 421/0 (g)
Dundee New York	0.20	592	0.034	4	Mature	Fruit	0.33	0.02	0.35	0	# 1999/5143 421/0 (g)
Hixton. Wisconsin	0.20	485	0.041	4	80% ripe	Fruit	0.30	0.03	0.33	0	# 1999/5143 421/0 (g)
Chula. Georgia	0.20	537	0.037	4	50% ripe fruit	Fruit	0.48	0.03	0.51	0	# 1999/5143 421/0 (g)
Pineboro. Georgia	0.20	514	0.039	4	Mature	Fruit	0.57	0.06	0.63	0	# 1999/5143 421/0 (g)

Table 57. Pyraclostrobin residues in bananas from supervised trials in Central and South America.

Location	Appl. per treatment				Growth stage at last tr. Date	Portion analysed	Residues			PHI days	trials number method
	kg ai/ha	Water L/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg metabolite 500M07	Total		
Costa Rica Limon-Guacimo	0.100	22	0.455	8	3) 11.05.99		≤0.02	<0.02	<0.04	0	# 1999/5095 D9808
Costa Rica Limon-Roxona	0.100	22	0.455	8	3) 11.05.99		≤0.02	<0.02	<0.04	0	# 1999/5095 D9808
Costa Rica Heredia-Rio Frio	0.107	22	0.486	8	3)11.05.99		≤0.02	<0.02	<0.04	0	# 1999/5095 D9808
Ecuador Guayas-Garaycoa	0.141	28	0.504	8	3)06.04.99		≤0.02	<0.02	<0.04	0	# 1999/5095 D9808
Ecuador Guayas-Garaycoa	0.121	24	0.504	8	3)06.04.99		≤0.02	<0.02	<0.04	0	# 1999/5095 D9808
Ecuador Guayas-Triunfo	0.120	24	0.500	8	3)05.04.99		≤0.02	<0.02	<0.04	0	# 1999/5095 D9808
Colombia Rio Frio Magdalena	0.092	21	0.438	8	3) 13.03.99		≤0.02	<0.02	<0.04	0	# 1999/5095 D9808
France lorrain martinique	0.100	27	0.370	8	3) 03.05.99		≤0.02	<0.02	<0.04	0	# 1999/5095 D9808
France Trinite Martinique	0.100	26	0.385	8	3) 04.05.99		≤0.02	<0.02	<0.04	0	# 1999/5095 D9808
Guatemala Tiquisate-Escuintla	0.100	22	0.455	8	3) 20.04.99	NA	≤0.02	<0.02	<0.04	0	# 1999/5095 D9808
Mexico Chiapas-Suchiate	0.108	28	0.386	8	312.04.99		≤0.02	<0.02	<0.04	0	# 1999/5095 D9808
BR Plantec 2000/056	0.100			2			≤0.02	0.02	<0.04	3	2001/5002341 D9908
	0.200			2			≤0.02	0.02	<0.04	3	

Table 58. Pyraclostrobin residues in papaya from supervised trials in Brazil.

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number method
	kg ai/ha	Water l/ha	kg as/hl	No of tr. date			mg/kg parent	mg/kg metabolite 500M07	Total		
Lagoa Grande-PE	0.125	1000	0.013	3 01/05/00	77-80	fruit	<0.05	<0.05	< 0.1	7	#00/1021357 D9904
	0.250	1000	0.025				<0.05	<0.05	< 0.1	7	
Sooretama-ES	0.125	1000	0.013	3 10/04/00	77-80	fruit	0.10	0.10	0.2	0	#00/1201359 D9904
							0.10	0.10	0.2	3	
							<0.05	<0.05	<0.1	7	
							<0.05	<0.05	< 0.1	14	
							<0.05	<0.05	<0.1	21	
Sao Mateus-ES	0.125	1000	0.013	3 10/04/00	77-80	fruit	<0.05	<0.05	< 0.1	7	#00/1021361 D9904
	0.250	1000	0.025				<0.05	<0.05	< 0.1	7	
Petrolina-PE	0.125	1000	0.013	3 18/03/00	77-80	fruit	<0.05	<0.05	< 0.1	7	#00/1021363 D9904
	0.250	1000	0.025				<0.05	<0.05	< 0.1	7	

Table 59. Pyraclostrobin residues in mangoes from supervised trials in Brazil.

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	Residues				trials number method
	kg ai/ha	Water L/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	Total	PHI days)	
Petrolia/PE	0.225	1500	0.015	3 02/04/00	81	fruit	<0.05	<0.05	< 0.1	0	#2001/1021505 D9904
							<0.05	<0.05	< 0.1	3	
							<0.05	<0.05	< 0.1	7	
							<0.05	<0.05	< 0.1	14	
							<0.05	<0.05	< 0.1	21	
JuazeiroBA	0.225	1500	0.015	3 25/04/00	81	fruit	<0.05	<0.05	< 0.1	7	#2001/1021507
	0.450	1500	0.030				<0.05	<0.05	< 0.1	7	
Baixo Guandu/ES	0.225	1500	0.015	3 06/12/00	81	fruit	<0.05	<0.05	< 0.1	0	2001/1021509 D9904
							<0.05	<0.05	< 0.1	3	
							<0.05	<0.05	< 0.1	7	
							<0.05	<0.05	< 0.1	14	
							<0.05	<0.05	< 0.1	21	
Baixo Guandu/ES	0.450	1500	0.030	3 06/12/00	81	fruit	<0.05	<0.05	< 0.1	0	2001/1021509 D9904
							<0.05	<0.05	< 0.1	3	
							<0.05	<0.05	< 0.1	7	
							<0.05	<0.05	< 0.1	14	
							<0.05	<0.05	< 0.1	21	
Mogi Mirim/SP	0.225	1500	0.015	3 19/02/00	89	fruit	<0.05	<0.05	< 0.1	7	#2001/1021511 D9904
	0.450	1500	0.030				<0.05	<0.05	< 0.1	7	

Table 60. Praclostrobin residues in carrots resulting from supervised trials in Brazil and the USA.

Location	Appl. per treatment						Residues			PHI days	trials number method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	mg/kg parent	mg/kg BF 500-	total		
BR 2000/490	0.100			2		RAC	0.03	<0.02	0.04	7	2001/5002340 D9908
	0.200			2		RAC	0.11	<0.02	0.13	7	
USA Florida Jennings.	0.090	263	0.034	6	9" long. 0.75-1.25"	carrot w/o top	0.06	< 0.02	0.08	0	# 1999/5155 421/0
USA Texas Uvalde.	0.090	210	0.043	6	1" diameter	carrot w/o top	0.03	< 0.02	0.05	0	# 1999/5155 421/0
USA Minnesota Clarks rove.	0.224	163	0.137	3	Vegetative	carrot w/o top	0.12	< 0.02	0.14	0	# 1999/5155 421/0
USACaliforn ia Porterville.	0.224	290	0.077	3	Mature	carrot w/o top	0.03	< 0.02	0.05	0	# 1999/5155 421/0
CaliforniaUS Porterville.	0.224	288	0.078	3	Mature	carrot w/o top	0.04	< 0.02	0.06	0	# 1999/5155 421/0

Location	Appl. per treatment						Residues			PHI days	trials number method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	mg/kg parent	mg/kg BF 500-	total		
USA Madera. California	0.224	286	0.078	3	Medium carrots	carrot w/o top	0.12 0.08 0.08 0.08 0.08	< 0.02 <0.02 < 0.02 <0.02 <0.02	0.14 0.10 0.10 0.10 0.10	0 5 9 15 20	# 1999/5155 4210
CaliforniaUS Madera.	0.224	374	0.060	3	Mature carrots	carrot w/o top	0.15	< 0.02	0.17	0	# 1999/5155 421/0
USA Idaho Jerome.	0.224	125	0.179	3	Full-sized carrots	carrot w/o top	0.24	< 0.02	0.26	0	# 1999/5155 421/0

Table 61. Pyraclostrobin residues in radishes resulting from supervised trials in the USA.

Location	Appl. per treatment			No of tr.	Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number method
	kg ai/ha	Water l/ha	kg as/hl				mg/kg parent	mg/kg BF 500-	total		
Germansville Lehigh Co.. Pennsylvania	0.224	292	0.077	3 27/09/	Mature	radish top radish root	15.02 0.23	0.35 < 0.02	15.37 0.25	0 0	# 1999/5149 421/0 (g)
Zellwood. Orange Co.. Florida	0.224	281	0.080	3 15/06/	6-8´´ tall	radish top radish root	9.94 0.08	0.12 < 0.02	10.06 0.10	0 0	# 1999/5149 421/0 (g)
Oviedo. Seminole Co.. Florida	0.224	287	0.078	3 06/07/	Mature	radish top radish root	12.19 0.30	0.13 < 0.02	12.32 0.32	0 0	# 1999/5149 421/0 (g)
USA	0.224	162	0.138	3 25/06/	Mature	radish top radish root	9.64 0.05	0.16 < 0.02	9.80 0.07	0 0	# 1999/5149 421/0 (g)
Fresno. Fresno Co.. California	0.224	95	0.236	3 05/10/	Mature	radish top radish root	7.48 0.07	0.18 < 0.02	7.66 0.09	0 0	# 1999/5149 421/0 (g)

Table 62. Pyraclostrobin residues in sugar beet from supervised trials in Europe and the USA.

Location	Appl. per treatment			No of tr.	Growth stage at last tr. date	Portion analysed	Residues			PHI days	trials number method
	kg ai/ha	Water L/ha	kg as/hl				mg/kg parent	mg/kg 500M07	total		
USA Williamston. Michigan	0.224	245	0.091	4	Mature 23/09	roots	0.13	0.02	0.15	7	# 1999/5157 421/0 (g)
USA Minnesota Geneva. Freeborn Co..	0.224	189	0.119	4	Vegetative 22/09/	roots	0.06 < 0.02 0.08 0.05 0.03	< 0.02 < 0.02 < 0.02 < 0.02 < 0.02	0.08 < 0.04 0.10 0.07 0.05	0 7 14 21 28	# 1999/5157 421/0 (g)
USA Campbell. Wilkin Co.. Minnesota	0.224	189	0.119	4	26 leaf 28/09/	roots	0.04	< 0.02	0.06	7	# 1999/5157 421/0 (g)
USA Northwood. Grand Dakota	0.224	232	0.097	4	25-30 leaf 08/10	roots	0.06	< 0.02	0.08	7	# 1999/5157 421/0 (g)
USA Arkansaw Pepin Co.. Wisconsin	0.224	187	0.120	4	Root Develop. 24/09	roots	0.08	0.02	0.10	7	# 1999/5157 421/0 (g)
USA Velva. McHenry co North Dakota	0.224	147	0.152	4	8´´diam. 23/09/	roots	0.11	0.03	0.14	8	# 1999/5157 421/0 (g)
USA Levelland. Hockley Co.Texas	0.224	240	0.093	4	Maturing 11/10	roots	0.02	0.02	0.04	7	# 1999/5157 421/0 (g)
USA Fruita. Mesa Co.. Colorado	0.224	284	0.079	4	Harvest 29/09	roots	0.03	0.02	0.05	7	# 1999/5157 421/0 (g)
USA Chico. Butte Co.California	0.224	255	0.088	4	Develop 24/08.	roots	< 0.02	< 0.02	< 0.04	7	# 1999/5157 421/0 (g)
USA Madera. Madera CoCalifornia	0.224	285	0.079	4	Mature 07/10/	roots	0.03	< 0.02	0.05	7	# 1999/5157 421/0 (g)

Location	Appl. per treatment			No of tr.	Growth stage at last tr. date	Portion analysed	Residues			PHI days	trials number method
	kg ai/ha	Water L/ha	kg as/hl				mg/kg parent	mg/kg 500M07	total		
USA Jerome. Jerome Co..Idaho	0.224	187	0.120	4	BBCH 42 14/09/	roots	0.04	< 0.02	0.06	7	# 1999/5157 421/0 (g)
USA Payette Co.. Idaho	0.224	273	0.082	4	Mature 06/10/	roots	< 0.02	< 0.02	< 0.04	7	# 1999/5157 421/0 (g)
B-3470 Kortenaken AGR/13/01	0.125	300	0.042	2	39 06/08/01	Roots	0.08	<0.02	0.10	0	#2002/1004108 445/0
							≤0.02	<0.02	<0.04	28	
							<0.02	<0.02	<0.04	43	
B-3470 Kortenaken LZ 4 Limburg AGR/13/01	0.133	300	0.044	2	39 06/08/01	Roots	<0.02	<0.02	<0.04	0	#2002/1004108 445/0
							≤0.02	<0.02	<0.04	28	
							<0.02	<0.02	<0.04	43	
NL-6595 Ottersum AGR/14/01	0.125	300	0.042	2	39 07/08/01	Roots	<0.02	<0.02	<0.04	0	#2002/1004108 445/0
							0.02	<0.02	0.04	27	
							<0.02	<0.02	<0.04	41	
NL-6595 Ottersum MS Limburg AGR/14/01	0.133	300	0.044	2	39 07/08/01	Roots	<0.02	<0.02	<0.04	0	#2002/1004108 445/0
							0.03	<0.02	0.05	27	
							<0.02	<0.02	<0.04	41	
D-74193 Stetten a. H. DU2/10/01	0.125	300	0.042	2	38 10/08/01	Roots	<0.02	<0.02	<0.04	0	#2002/1004108 445/0
							≤0.02	<0.02	<0.04	28	
							<0.02	<0.02	<0.04	42	
D-74193 Stetten a. H. Baden Wuerttembeg DU2/10/01	0.133	300	0.044	2	38 10/08/01	Roots	<0.02	<0.02	<0.04	0	#2002/1004108 445/0
							≤0.02	<0.02	<0.04	28	
							<0.02	<0.02	<0.04	42	
F-67160 Seebach FAN/02/01	0.125	300	0.042	2	39 03/09/01	Roots	<0.02	<0.02	<0.04	0	#2002/1004108 445/0
							≤0.02	<0.02	<0.04	28	
							<0.02	<0.02	<0.04	42	
F-67160 Seebach Alsace FAN/02/01	0.133	300	0.044	2	39 03/09/01	roots	<0.02	<0.02	<0.04	0	#2002/1004108 445/0
							≤0.02	<0.02	<0.04	28	
							<0.02	<0.02	<0.04	42	

Table 63. Pyraclostrobin residues in garlic and onions resulting from supervised trials in Brazil and the USA.

	Appl. per treatment						Residues				trials number
Location	kg ai/ha	Water l/ha	kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	mg/kg parent	mg/kg 500M07	total	PHI days	method
Garlic											
BR Shokucho CDR/F 2000/373	0.100	500	0.020	4 08/08/00	43		<0.02	<0.02	<0.04	0	#2001/5002342 D9908
							≤0.02	<0.02	<0.04	7	
							<0.02	<0.02	<0.04	14	
							<0.02	<0.02	<0.04	21	
							<0.02	<0.02	<0.04	28	
BR/BR5	0.100	500	0.020	4	95		0.05	<0.02	0.07	7	#2001/5002342
2000/374	0.200	500	0.040	27/11/99			<0.02	<0.02	<0.04	7	D9908
BR/BR5	0.100	500	0.020	4	95		0.03	<0.02	0.05	7	#2001/5002342
2000/375	0.200	500	0.040	18/12/99			0.05	<0.02	0.05	7	D9908
BR Fitopesquisa	0.100	400	0.025	4	81		≤0.02	<0.02	<0.04	7	#2001/5002342
2000/376	0.200	400	0.025	4/12/99			0.04	0.03	0.07	7	D9908
Onions											
BR Shokucho 2000/263	0.150	500	0.030	5 27/06/00	42		<0.02	<0.02	<0.04	0	#2001/5002342 D9908
							<0.02	<0.02	<0.04	7	
							<0.02	<0.02	<0.04	14	
							<0.02	<0.02	<0.04	21	
							<0.02	<0.02	<0.04	28	
BR/BRU	0.150	500	0.030	4	beg.		<0.02	<0.02	<0.04	7	#2001/5002342
2000/264	0.300	500	0.060	10/10/00	ripping		<0.02	<0.02	<0.04	7	D9908
BR/BRX	0.150	500	0.030	4	beg.		0.04	0.02	0.06	7	#2001/5002342
2000/265	0.300	500	0.060	09/07/00	ripping		0.18	0.04	0.22	7	D9908
BR/BRX	0.150	500	0.030	4	mature		0.21	0.06	0.27	7	#2001/5002342
2000/266	0.300	500	0.060	06/03/00			0.41	0.09	0.50	7	D9908

Appl. per treatment							Residues			trials number	
Location	kg ai/ha	Water l/ha	kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	mg/kg parent	mg/kg 500M07	total	PHI days	method
USA Pennsylvania Germansville	0.168	215	0.078	6 13/7/99	8-10 leaf Maturing	dry bulb	0.03	< 0.02	0.05	7	# 1999/5158 421/0 (g)
USA Texas Uvalde.	0.168	209	0.080	6 7/6/99	Mature	dry bulb	0.02	< 0.02	0.04	7	# 1999/5158 421/0 (g)
USA Texas Claude.	0.168	222	0.076	6 10/08/99	4"diam.	dry bulb	0.02	< 0.02	0.04	7	# 1999/5158 421/0 (g)
USA Porterville. California	0.168	284	0.059	6 26/08/99	Mature	dry bulb	0.11	< 0.02	0.13	0	# 1999/5158 421/0 (g)
							0.02	< 0.02	0.04	7	
							< 0.02	< 0.02	< 0.04	14	
							< 0.02	< 0.02	< 0.04	21	
							< 0.02	< 0.02	< 0.04	28	
USCalifornia Madera.	0.168	286	0.059	6 10/08/99	Large	dry bulb	0.09	< 0.02	0.11	7	# 1999/5158 421/0 (g)
USA Oregon Culver.	0.168	296	0.057	6 09/09/99	2-3' diam.	dry bulb	0.02	< 0.02	0.04	7	# 1999/5158 421/0 (g)
USA Texas Uvalde.	0.168	210	0.080	6 07/06/99	1" bulbs	green onions	0.42	0.08	0.50	7	# 1999/5158 421/0 (g)
USCalifornia Porterville.	0.168	293	0.057	6 08/07/99	8+leaves	green onions	0.53	0.05	0.58	7	# 1999/5158 421/0 (g)
USCalifornia Madera.	0.168	294	0.057	6 12/08/99	Mature onions	green onions	0.05	< 0.02	0.07	7	# 1999/5158 421/0 (g)

Table 64. Pyraclostrobin residues in tomatoes resulting from supervised trials in Brazil and the USA.

Location	Appl per treatment			No of tr date.	Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number Method
	kg ai/ha	Water l/ha	kg as/hl				mg/kg parent	mg/kg 500M07	total		
USA Germansville Pennsylvania	0.224	189	0.119	6 27/08/98	Mature	tomato	0.21	0.03	0.24	0	# 1999/5084 421/0 (g)
							0.15	0.02	0.17	3	
							0.11	0.02	0.13	7	
							0.10	0.02	0.12	10	
							0.09	0.02	0.11	15	
USA North Carolina Rose Hill.	0.224	189	0.119	6 04/08/98	Mature	tomato	0.17	< 0.02	0.19	0	# 1999/5084 421/0 (g)
USA Florida Hobe Sound.	0.224	374	0.060	6 08/06/98	Mature	tomato	0.11	0.02	0.13	0	# 1999/5084 421/0 (g)
USA Florida Shady Grove.	0.224	241	0.093	6 11/06/98	Mature	tomato	0.12	< 0.02	0.14	0	# 1999/5084 421/0 (g)
USA Michigan Conklin.	0.224	224	0.100	6 26/08/98	Mid-maturity	tomato	0.10	< 0.02	0.12	0	# 1999/5084 421/0 (g)
USA Porterville. USCalifornia	0.224	286	0.078	6 28/08/98	Mature	tomato	0.19	0.04	0.23	0	# 1999/5084 421/0 (g)
							0.17	0.03	0.20	3	
							0.14	0.03	0.17	7	
							0.15	0.04	0.19	10	
							0.10	< 0.02	0.12	15	
USCalifornia Porterville.	0.224	286	0.078	6 10/09/98	Mature	tomato	0.15	0.02	0.17	0	# 1999/5084 421/0 (g)
USCalifornia King City.	0.224	286	0.078	6 08/09/98	Mature	tomato	0.16	0.02	0.18	0	# 1999/5084 421/0 (g)
USCalifornia Fresno.	0.224	185	0.121	6 09/09/98	-	tomato	0.12	0.02	0.14	0	# 1999/5084 421/0 (g)
USCalifornia Five Points.	0.224	188	0.119	6 31/08/98	-	tomato	0.08	< 0.02	0.10	0	# 1999/5084 421/0 (g)
USCalifornia Merced.	0.224	188	0.119	6 28/07/98	70% Red-pink	tomato	0.17	0.03	0.20	0	# 1999/5084 421/0 (g)
USCalifornia Willows.	0.224	249	0.090	6 11/08/98	-	tomato	0.17	< 0.02	0.19	0	# 1999/5084 421/0 (g)
USCalifornia Madera.	0.224	285	0.079	6 04/08/98	-	tomato	0.07	< 0.02	0.09	0	# 1999/5084 421/0 (g)
USCalifornia Five Points.	0.224	285	0.079	6 11/08/98	-	tomato	0.12	< 0.02	0.14	0	# 1999/5084 421/0 (g)

Location	Appl per treatment			No of tr date.	Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number Method
	kg ai/ha	Water l/ha	kg as/hl				mg/kg parent	mg/kg 500M07	total		
USCalifornia Le Grand.	0.224	290	0.077	6 13/08/98	-	tomato	0.13	0.03	0.16	0	# 1999/5084 421/0 (g)
USA Pennsylvania Germansville	0.225	282	0.080	6 05/08/99	Pre breaker	tomato	0.07	<0.02	0.09	0	# 1999/5145 D9808
USA North Carolina Magnolia	0.227	189	0.120	6 05/07/99	Mature	tomato	0.11	<0.02	0.13	0	# 1999/5145 D9808
USA Madera California	0.221	369	0.060	6 28/07/99	green to ripe	tomato	0.13	<0.02	0.15	0	# 1999/5145
USA Pennsylvania Germansville	0.200	282	0.071	6 05/08/99	Pre breaker	tomato	0.11	<0.02	0.13	0	# 1999/5145 D9808
USA north calorina Magnolia	0.200	189	0.106	6 05/07/99	Mature fruit	tomato	0.06	<0.02	0.08	0	# 1999/5145 D9808
USCalifornia Madera.	0.200	369	0.054	6 28/07/99	green to ripe	tomato	0.11	<0.02	0.13	0	# 1999/5145 D9808
BR/BRU Porto Feliz-	0.200	500	0.040	5 17/06/00	83	tomato	0.02	<0.02	<0.04	3	#2001/5000022 D9908
	0.400	500	0.080			tomato	0.02	<0.02	<0.04	3	
BR/BRT Cambe-PR	0.200	500	0.040	5 15/05/00	89	tomato	0.03	<0.02	0.05	3	#2001/5000022 D9908
	0.400	500	0.080			tomato	0.02	<0.02	0.04	3	
BR/BRV Araguari-MG 2000/260/BR	0.200	500	0.040	5 05/06/00	77	tomato	0.14	<0.02	0.16	0	#2001/5000022 D9908
							0.07	<0.02	0.09	1	
							0.12	<0.02	0.14	3	
							0.07	<0.02	0.09	7	
							0.09	<0.02	0.11	10	

Table 65. Pyraclostrobin residues in pepper resulting from supervised trials in Brazil and the USA.

Location	Appl. per treatment			No of tr.	Growth stage at last tr.	Portion analysed	residues			PHI days	trials number Methods
	kg ai/ha	Water l/ha	kg as/hl				mg/kg parent	mg/kg 500M07	total		
BR/BRX 2000/577	0.15	500	0.030	4 05/07/00	ripening	pepper	0.12	<0.02	0.14	0	#2001/5002342 D9908
							0.11	0.02	0.13	1	
							0.04	0.02	0.07	3	
							<0.02	0.02	<0.04	7	
							<0.02	0.02	<0.04	10	
BR/BRU 2000/502	0.15	500	0.030	4 27/08/00	71	pepper	0.17	<0.02	0.19	3	#2001/5002342 D9908
	0.30	500	0.060			pepper	0.52	<0.02	0.54	3	
BR/BRT 2000/574	0.15	500	0.030	4 08/07/00	87	pepper	0.22	<0.02	0.24	3	#2001/5002342 D9908
	0.30	500	0.060			pepper	0.17	<0.02	0.19	3	
BR/BRV 2000/576	0.15	500	0.030	4 19/10/60	85	pepper	0.32	0.07	0.39	3	#2001/5002342 D9908
	0.30	500	0.060			pepper	0.28	0.05	0.33	3	
USA Oklahoma Dill City.	0.224	265	0.085	6 26/07/99	Heavy Set	pepper	0.82	0.04	0.86	0	# 1999/5151 421/0 (g)
USA Texas Claude.	0.224	227	0.099	6 09/09/99	Harvest	pepper	0.22	< 0.02	0.24	0	# 1999/5151 421/0 (g)
USA New Mexico Hatch.	0.224	227	0.099	6 05/08/99	6-10" fruit	pepper	0.14	< 0.02	0.16	0	# 1999/5151 421/0 (g)

Table 66. Pyraclostrobin residues in squash summer resulting from supervised trials in the USA.

Location	Appl. per treatment			No of tr. date	Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number method
	kg ai/ha	Water l/ha	Kg as/hl				mg/kg parent	mg/kg 500M07	total		
Germansville Pennsylvania	0.224	190	0.118	6 21/07/	Mature fruit	squash	0.17	<0.02	0.19	0	# 1999/5083 421/0 (g)

Location	Appl. per treatment			No of tr. date	Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number method
	kg ai/ha	Water l/ha	Kg as/hl				mg/kg parent	mg/kg 500M07	total		
Rose Hill North Carolina.	0.224	191	0.117	6 10/07/	Fruiting	squash	0.07	<0.02	0.09	0	# 1999/5083 421/0 (g)
Oviedo Florida .	0.224	145	0.154	6 16/06/	Mature	squash	0.14	<0.02	0.16	0	# 1999/5083 421/0 (g)
Arkansaw .Wisconsin	0.224	195	0.115	6 16/06/	Fruit formation	squash	0.15	<0.02	0.17	0	# 1999/5083 421/0 (g)
Fresno California	0.224	191	0.117	6 05/08	Fruit mature	squash	0.18	<0.02	0.20	0	# 1999/5083 421/0 (g)
USAGerman sville Pennsylania	0.225	281	0.080	6 22/07/	Fruit mature	squashh	0.03	<0.02	0.05	0	# 1999/5145

Table 67. Pyraclostrobin residues in cucumber resulting from supervised trials in Brazil.

Location	Appl. per treatment			No of tr.	Growth stage at last tr date.	Portion analysed	Residues			PHI days	trials number Method
	kg ai/ha	Water l/ha	kg as/hl				mg/kg parent	mg/kg 500M07	total		
BRV Tapuirama-2000/155/	0.100	400	0.025	4	81 9/9/00	Ccucumber	≤0.02	0.02	<0.04	7	#2001/5002342 D9908
	0.200	400	0.050				<0.02	0.02	<0.04	7	
BRU Elias Fausto 2000/156	0.100	400	0.025	4	79-81 10/10/00	Ccucumber	≤0.02	<0.02	<0.04	7	#2001/5002342 D9908
	0.200	400	0.050				0.03	<0.02	0.05	7	
BRT Marilia-SP 2000/157/	0.100	400	0.025	4	81 10/10/00	Ccucumber	0.02	<0.02	<0.04	0	#2001/5002342 D9908
							0.02	<0.02	<0.04	3	
							0.02	<0.02	<0.04	7	
							0.02	<0.02	<0.04	14	
BRT Morretes-PR 2000/158/	0.100	400	0.025	4	81 30/04/01	Ccucumber	≤0.02	<0.02	<0.04	7	#2001/5002342 D9908
	0.200	400	0.050				<0.02	<0.02	<0.04	7	

Table 68. Pyraclostrobin residues in lettuce resulting from supervised trials in the USA.

Location	Appl. per treatment			No of tr. date	Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number Method
	kg ai/ha	Water l/ha	Kg as/hl				mg/kg parent	mg/kg 500M07	total		
California Salinas	0.224	625	0.036	4 15/08/	mature heads	w/o wrapper leav.	3.69	0.14	3.83	0	# 2002/5003764 D9908
Florida Gainesville	0.224	375	0.060	4 03/01/	vegetative	w/o wrapper leav.	13.70	0.34	14.00	0	# 2002/5003764 D9908
California El Centro	0.224	510	0.044	4 12/01/	Mature	w/o wrapper leav.	1.95	0.09	2.04	0	# 2002/5003764 D9908
columbia Cloverdale	0.224	719	0.031	4 21/08/	mature plant	w/o wrapper leav.	4.96	0.21	5.17	0	# 2002/5003764 D9908
California Parlier	0.224	346	0.065	4 03/01/	Mature	w/o wrapper leav.	19.70	0.35	20.10	0	# 2002/5003764 D9908
California Parlier	0.224	341	0.066	4 27/12/	Mature	w/o wrapper leav.	14.90	0.36	15.30	0	# 2002/5003764 D9908

Table 69. Pyraclostrobin residues in beans resulting from supervised trials in the USA.

Location USA	Appl. per treatment			No of tr.	Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number Method
	kg ai/ha	Water l/ha	kg as/hl				mg/kg parent	mg/kg 500M07	total		
Northwood. grand Forks	0.224	187	0,12	2	21/08/2000	Dry Beans	≤0.02	<0.02	<0.04	21	# 2001/5000906 D9808
Gardner.Cass county	0.230	191	0,12	2	17/08/2000	Dry Beans	≤0.02	<0.02	<0.04	21	# 2001/5000906 D9808

Location USA	Appl. per treatment			No of tr.	Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number Method
	kg ai/ha	Water l/ha	kg as/hl				mg/kg parent	mg/kg 500M07	total		
Geneva. MN	0.224	168		2	01/09/2000	Dry Beans	<0.02	<0.02	<0.04	21	# 2001/5000906
Arkansaw.W	0.225	188		2	04/09/2000	Dry Beans	<0.02	<0.02	<0.04	28	# 2001/5000906
Velva. ND	0.225	141	0,16	2	16/08/2000	Dry Beans	<0.02	<0.02	<0.04	21	# 2001/5000906
LevellandTX	0.229	189	0,12	2	12/09/2000	Dry Beans	<0.02	<0.02	<0.04	21	# 2001/5000906
Wellington CO	0.218	107		2	Plants 12-18" tall.	Dry Beans	0.10	0.04	0.14	21	# 2001/5000906 D9808
Durham CA	0.223	218		2	Plants30" tall.	Dry Beans	0.04	<0.02	0.06	21	# 2001/5000906 D9808
Payette ID	0.228	285		2	Plants 18" tall.	Dry Beans	<0.02	<0.02	< 0.04	21	# 2001/5000906 D9808
Taber AB	0.225	203		2	BBCH 80-81	Dry Beans	<0.02	<0.02	<0.04	21	# 2001/5000906 D9808
Germansville.PA	0.230	287	0.08	2	plants 12-18" tall.	Snap Beans	0.10	0.04	0.14	7	# 2001/5000906 D9808
Athens CA	0.225	259	0.08	2	plants 12-17" tall.	Snap Beans	0.10	0.04	0.14	7	# 2001/5000906 D9608
Geneva MN	0.224	170	0.13	2	Plants 10" tall.	Snap Beans	0.13	0.03	0.15	7	# 2001/5000906 D9808
Arkansaw W	0.227	189	0.12	2	plants 17"	Snap Beans	<0.02	<0.02	0.04	14	2001/5000906
Madera CA	0.224	280	0.08	2	plants 12-16" tall.	Snap Beans	0.08	0.06	0.13	7	# 2001/5000906 D9808
Jerome ID	0.222	308	0.07	2	mature beans	Snap Beans	0.04	0.03	0.07	7	# 2001/5000906
Kings county NS	0.225	248	0.091	2	plants 8-30" tall.	Snap Beans	0.11	0.02	0.13	7	# 2001/5000906 D9808
St. Cesaire .QC	0.222	274	0.08	2	BBCH 75	Snap Beans	0.12	0.03	0.15	7	# 2001/5000906 D9808
St. Cesaire. QC	0.226	283	0.08	2	plants 10-12" tall.	Snap Beans	0.16	0.03	0.19	7	# 2001/5000906 D9808

Table 70. Pyraclostrobin residues in lentils resulting from supervised trials in Canada and the USA.

Location	Appl. per treatment			No of tr.	Growth stage at last tr.	Portion analysed	Residues			PHI days	trials number Method
	kg ai/ha	Water l/ha	kg as/hl				mg/kg parent	mg/kg 500M07	total		
USA Gardner. Cass Co.. North Dakota	0.224	192	0.117	2	Flowering early pods 13/08/99	seed	0.04	< 0.02	0.06	26	# 1999/5159 421/0 (g)
							0.03	< 0.02	0.05	30	
							0.05	< 0.02	0.07	35	
							0.06	< 0.02	0.08	40	
							0.04	< 0.02	0.06	45	
USA North Dakota Velva.	0.224	144	0.156	2	Flowering 21/07/99	seed	0.08	< 0.02	0.10	29	# 1999/5159 421/0 (g)
USADagmar. Montana	0.224	142	0.158	2	Flowering 21/07/99	seed	0.17	0.05	0.22	29	# 1999/5159 421/0 (g)
Canada Sherwood Alberta	0.224	110	0.204	2	Flowering/ early pod 28/07/99	seed	0.15	0.08	0.23	33	# 1999/5159 421/0 (g)
Canada Hamiota. Manitoba	0.224	110	0.204	2	Flowering 11/08/99	seed	0.11	0.03	0.13	30	# 1999/5159 421/0 (g)
							0.39	0.09	0.48	30	

Table 71. Pyraclostrobin residues in dry peas resulting from supervised trials in Canada and the USA.

location	Appl. per treatment				Growth stage at last tr.	Portion analysed	residues			PHI days	Trials number Method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
USA Campbell. Wilkin Co.. Minnesota	0.224	190	0.118	2 01/07/99	Beginning pod	seed	< 0.02	< 0.02	< 0.04	25	# 1999/5154 421/0 (g)
							< 0.02	< 0.02	< 0.04	30	
							< 0.02	< 0.02	< 0.04	35	
							< 0.02	< 0.02	< 0.04	40	
							< 0.02	< 0.02	< 0.04	46	

location	Appl. per treatment				Growth stage at last tr.	Portion analysed	residues			PHI days	Trials number Method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
USA Fergus Falls Ottertail Co.Minnesota	0.224	190	0.118	2 02/07/99	Beginning pod	seed	< 0.02	< 0.02	< 0.04	30	# 1999/5154 421/0 (g)
Canada Red Deer. Alberta	0.224	95	0.236	2 09/08/99	50% pod formation	seed	0.14	0.10	0.24	30	# 1999/5154 421/0 (g)
Canada Lacombe. Alberta	0.224	95	0.236	2 17/08/99	Pods 10-20%fill	seed	0.13	0.12	0.25	34	# 1999/5154
Canada Blaine Lake. Saskatchewan	0.224	114	0.196	2 03/08/99	Beginning pod develop	seed	0.05	0.02	0.07	30	# 1999/5154 421/0 (g)
Canada Wakaw Hoodoo Co.. Saskatchewan	0.224	114	0.196	2 03/08/99	Flowering/ Beginning pod filling	seed	0.09	0.07	0.16	29	# 1999/5154 421/0 (g)
Canada Minto. Whitewater Manitoba	0.224	102	0.220	2 5/08/99	Ripe peas	seed	0.04	0.04	0.09	30	# 1999/5154 421/0 (g)
Canada Minto. Whitewater Manitoba	0.224	102	0.220	2	End flower early ripening	seed	0.20	0.14	0.34	30	# 1999/5154 421/0 (g)

Table 72. Pyraclostrobin residues in peanut resulting from supervised trials in Brazil and the USA.

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	residues			PHI days	Trials number Method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
USA Rose Hill. Sampson .. North Carolina (RCN 98045)	0.28	190	0.147	5	11/09/98	peanut. kernels	< 0.02	0.020	< 0.04	0	# 1999/5078 421/0 (g)
							< 0.02	< 0.02	< 0.04	7	
							0.025	< 0.02	< 0.05	14	
							< 0.02	< 0.02	< 0.04	21	
							< 0.02	< 0.02	< 0.04	28	
USA Elko. Barnwell Sth Carolina (RCN 98046)	0.28	191	0.147	5	Pods 07/10/98	peanut. kernels	< 0.02	< 0.02	< 0.04	14	# 1999/5078 421/0 (g)
USA Georgia Chula.Tift .. (RCN 98047)	0.28	366	0.077	5	Pod fill / Maturation 17/9/98	peanut. kernels	< 0.02	< 0.02	< 0.04	14	# 1999/5078 421/0 (g)
USA Columbia. Alabama (RCN 98048)	0.28	178	0.157	5	Pod fill / Maturation 27/08/98	peanut. kernels	< 0.02	< 0.02	< 0.04	14	# 1999/5078 421/0 (g)
USA Texas Vernon. Wilbarger (RCN 98049)	0.28	177	0.158	5	R7 24/09/98	peanut. kernels	< 0.02	< 0.02	< 0.04	14	# 1999/5078 421/0 (g)
USA Seven spring Wayne Co N. Carolina (RCN 97123)	0.28	95	0.295	5	Fruit filling 23/09/97	peanut. kernels	< 0.02	< 0.02	< 0.04	7	# 1999/5071 421/0 (g)
							< 0.02	< 0.02	< 0.04	14	
							< 0.02	< 0.02	< 0.04	21	
USA Elko. Barnwell S. Carolina	0.28	96	0.292	5	03/10/97	peanut. kernels	< 0.02	< 0.02	< 0.04	14	# 1999/5071 421/0 (g)
USA Montezuma Macon Co.. Georgia	0.28	95	0.295	5	18/09/97	peanut. kernels	< 0.02	< 0.02	< 0.04	14	# 1999/5071 421/0 (g)
USA Chula. Tift Co.. Georgia	0.28	95	0.295	5	11/09/97	peanut. kernels	< 0.02	< 0.02	< 0.04	14	# 1999/5071 421/0 (g)
USA Malone. Jackson Co.. Florida	0.28	96	0.292	5	19/09/97	peanut. kernels	< 0.02	< 0.02	< 0.04	14	# 1999/5071 421/0 (g)

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	residues			PHI days	Trials number Method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
USA Levelland. Hockley Co.. Texas	0.28	95	0.295	5	Maturing 20/10/97	peanut. kernels	≤ 0.02	< 0.02	< 0.04	14	# 1999/5071 421/0 (g)
USA Eakly. Caddo Co.. Oklahoma (RCN 97129)	0.28	96	0.292	5	Mature 25/09/ 97	peanut. kernels	≤ 0.02	< 0.02	< 0.04	18	# 1999/5071 421/0 (g)
BR Plantec 2000/427	0.150	300	0.05	2		peanut. kernels	< 0.02	< 0.02	< 0.04	14	#2000/5241 D9908
	0.300	300	0.1	2			< 0.02	< 0.02	< 0.04	14	
BR Shokucho	0.150	300	0.05	2		peanut. kernels	≤ 0.02	< 0.02	< 0.04	14	#2000/5241 D9908
	0.300	300	0.1	2			< 0.02	< 0.02	< 0.04	14	
BR Plantec 2000/428	0.150	300	0.05	2		peanut. kernels	< 0.02	< 0.02	< 0.04	14	#2000/5241 D9908
	0.300	300	0.1	2			< 0.02	< 0.02	< 0.04	14	
BR Plantec 2000/429	0.150	300	0.05	2		peanut. kernels	< 0.02	< 0.02	< 0.04	0	#2000/5241 D9908
							≤ 0.02	<0.02	< 0.04	7	
							< 0.02	<0.02	< 0.04	21	
							< 0.02	<0.02	< 0.04	28	

Table 73. Pyraclostrobin residues in soya beans resulting from supervised trials in Brazil and Argentina.

location	Appl. per treatment				Growth stage at last tr.	Portion analysed	Residues			PHI days	Trials number Method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
BR/ BR2 Nova Ramadas-RS 2000/365/	0.100	200	0.050	**2**	98-100	Grain	<0.02	<0.02	<0.04	0	#2001/5002355 D9908
							<0.02	<0.02	<0.04	7	
							≤0.02	<0.02	<0.04	14	
							<0.02	<0.02	<0.04	21	
							<0.02	<0.02	<0.04	28	
BR/ BRT Londrina-PR 2000/366/	0.100	200	0.050	**2**	98	Grain	≤0.02	<0.02	<0.04	14	#2001/5002355 D9908
	0.200	200	0.100	2	98		<0.02	<0.02	<0.04	14	
BR /BRT Lapa-PR 2000/367/	0.100	200	0.050	**2**	98	Grain	≤0.02	<0.02	<0.04	14	#2001/5002355 D9908
	0.200	200	0.100	2	98		<0.02	<0.02	<0.04	14	
BR/ BRV Überlandia- 2000/368/	0.100	200	0.050	**2**	99	Grain	≤0.02	<0.02	<0.04	14	#2001/5002355 D9908
	0.200	200	0.100	2	99		<0.02	<0.02	<0.04	14	
AR Chaco	0.075	200	0.038	**2**	76	pod with grain	0.29	<0.02	0.31	1	#2001/1017043 445/0
						grain	0.03	<0.02	0.05	20	
						grain	<0.02	<0.02	<0.04	48	
	0.150	200	0.075	2	76	pod with grain	0.55	<0.02	0.57	1	
						Grain	0.04	<0.02	0.06	20	
						Grain	<0.02	<0.02	<0.04	48	

Table 74. Pyraclostrobin residues in potatoes from supervised trials in Brazil, Canada and the USA.

Location	Appl. per treatment			No of tr.	Growth stage at last tr.	Portion analysed	residues				Trials number method
	kg ai/ha	Water l/ha	kg as/hl				Mg/kg parent	mg/kg 500M07	total	PHI days	
USA Pensylvania Germainsville	0.224	207	0.108	6	09/07/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
							< 0.02	< 0.02	< 0.04	14	
							< 0.02	< 0.02	< 0.04	23	
							< 0.02	< 0.02	< 0.04	33	
							< 0.02	< 0.02	< 0.04	43	
USA Pensylvania Neffs Lehigh.	0.224	274	0.082	6	12/07/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
USA New Jersey baptistwon	0.224	270	0.083	6	06/7/99	tuber	≤0.02	< 0.02	<0.04	3	# 1999/5148 421/0 (g)
Canada Nova Scotia Port Wiallams	0.224	204	0.11	4	24/8/99	tuber	≤0.02	< 0.02	<0.04	3	# 1999/5148 421/0 (g)

Location	Appl. per treatment			No of tr.	Growth stage at last tr.	Portion analysed	residues				Trials number method
	kg ai/ha	Water l/ha	kg as/hl				Mg/kg parent	mg/kg 500M07	total	PHI days	
Canada Island Rusticoville	0.224	200	0.112	4	11/9/99	tuber	≤0.02	< 0.02	<0.04	3	# 1999/5148 421/0 (g)
USA Vrginia Chuckatuck	0.224	204	0.110	6	15/7/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
USA Florida. O'Brien	0.224	232	0.097	6	21/5/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
USA Minnesota Geneva	0.224	170	0.1.32	6	25/05/99	tuber	≤ 0.02 < 0.02 < 0.02 < 0.02 < 0.02	< 0.02 < 0.02 < 0.02 < 0.02 < 0.02	< 0.04 < 0.04 < 0.04 < 0.04 < 0.04	3 14 23 33 43	# 1999/5148 421/0 (g)
USA Minnesota Hollandale	0.224	170	0.132	6	25/8/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
USA Wisconsin Arkansaw	0.224	382	0.059	6	27/08/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
USAMinnesota Theilman	0.224	377	0.059	6	20/8/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
Canada Quebec St Paul d'abbotsford	0.224	252	0.089	4	16/8/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
Canada Alberta Taber	0.224	310	0.072	4	13/08/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
USA Colorado Center	0.224	287	0.078	6	13/9/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
USA California Kerman	0.224	185	0.121	6	26/7/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
USA Idaho Payette	0.224	287	0.078	6	9/9/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
USAOregon Malheur	0.224	290	0.077	6	9/9/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
USA Idaho Jerome Jerome Co..	0.224	186	0.120	6	24/08/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5157 421/0 (g)
USA Idaho Wendell	0.224	189	0.119	6	19/8/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
USA Idaho American falls	0.224	193	0.116	6	6/9/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
USA Idaho Aberdeen	0.224	193	0.116	6	6/9/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
Canada britih colum Abbotsford	0.224	275	0.081	4	18/8/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
Canada Manitoba Douglas	0.224	227	0.099	4	13/08/99	tuber	≤ 0.02	< 0.02	< 0.04	3	# 1999/5148 421/0 (g)
BR Lapa 2000/215/BRT	0.15 0.30	500 500	0.03 0.06	6 6	27/1/00 stage 79	tuber	≤ 0.02 < 0.02	< 0.02 < 0.02	< 0.04 < 0.04	3	# 2000/5000022 DD 9908
BR Castro 2000/218/BR5	0.15 0.30	500 500	0.03 0.06	6 6	7/5/00 stage 99	tuber	≤ 0.02 < 0.02	< 0.02 < 0.02	< 0.04 < 0.04	3	# 2000/5000022 DD 9908
BR Piedade 2000/216BRU	0.15 0.30	500 500	0.03 0.06	6 6	21/4/00 stage 99	tuber	≤ 0.02 < 0.02	< 0.02 < 0.02	< 0.04 < 0.04	3	# 2000/5000022 DD 9908
BR Ueraba 2000/217/BRV	0.15	500	0.03	6	27/1/00 stage 99	tuber	≤ 0.02 <0.02 <0.02 <0.02	< 0.02 <0.02 <0.02 <0.02	< 0.04 < 0.04 < 0.04 < 0.04	3 7 14 21	# 2000/5000022 DD 9908

Table 75. Pyraclostrobin residues in oats resulting from supervised trials in Brazil.

location	Appl. per treatment				Growth stage at last tr.	Portion analysed	residues			PHI days	Trials number method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.			Mg/kg parent	mg/kg 500M07	total		
BR Santagro 2000/001	0.200	200	0.1	2	69	Grain	0.67	0.02	0.69	0	#2000/5236
							0.26	0.03	0.29	7	
							0.08	0.02	0.10	15	
							0.04	<0.02	0.06	30	
							<0.02	<0.02	0.04	45	
BR 2000/002	0.200	200	0.1	2	72-75	Grain	0.14	0.05	0.19	30	#2000/5236
	0.400	200	0.2	2	72-75		0.20	0.10	0.30	30	

location	Appl. per treatment				Growth stage at last tr.	Portion analysed	residues			PHI days	Trials number method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.			Mg/kg parent	mg/kg 500M07	total		
BR 2000/003	0.200	200	0.1	2	77-82	Grain	0.42	0.17	0.59	30	#2000/5236
	0.400	200	0.2	2	77-82		0.84	0.32	1.17	30	
BR 2000904	0.200	200	0.1	2	75	grain	0.06	<0.02	0.08	30	#2000/5236
	0.400	200	0.2	2	75		0.12	0.02	0.14	30	
BR Santagro 2000/013	0.166	200	0.083	2	69	grain	0.36	<0.02	0.37	0	#2000/5236
							<0.02	<0.02	<0.04	7	
							0.18	0.04	0.22	15	
							0.05	<0.02	0.05	30	
							0.05	<0.02	0.05	45	
BR 2000/903	0.166	200	0.083	2	72-75	grain	0.20	0.10	0.29	30	#2000/5236
	0.333	200	0.166	2	72-75		0.09	0.03	0.12	30	
BR 2000/014	0.166	200	0.083	2	72-75	Grain	0.25	0.13	0.38	30	#2000/5236
	0.333	200	0.166	2	72-75		0.09	0.04	0.12	30	
BR 2000/015	0.166	200	0.083	2	77-82	grain	0.23	0.12	0.35	30	#2000/5236
	0.333	200	0.166	2	77-82		0.29	0.15	0.44	30	

Table 76. Pyraclostrobin residues in wheat from supervised trials in Europe, the USA, Canada and Brazil.

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	residues			PHI days	Trials number method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
E – 41500 Alcala de Guadaira (ALO/09/98)	0.250	300	0.083	2	69	Ears	0.60	0.28	0.88	22	# 1999/11509 421/0
						Ears	0.17	0.10	0.27	36	
						grain	≤ 0.02	< 0.02	< 0.04	42	
E - 41727 Maribanez (ALO/07/98)	0.250	300	0.083	2	69	Ears	0.34	0.11	0.45	21	# 1999/11509 421/0
						Ears	0.33	0.10	0.43	33	
						grain	≤ 0.02	< 0.02	< 0.04	42	
E - 41500 Alcala de Guadaira (ALO/08/98)	0.250	300	0.083	2	69	Ears	0.48	0.26	0.74	22	# 1999/11509 421/0
						Ears	0.15	0.08	0.23	37	
						grain	≤ 0.02	< 0.02	< 0.04	42	
E - 41727 Maribanez (ALO/07/98)	0.233	300	0.078	2	69	Ears	0.39	0.13	0.52	21	# 1999/11509 421/0
						Ears	0.20	0.07	0.27	33	
						grain	≤ 0.02	< 0.02	< 0.04	42	
E - 41500 Alcala de Guadaira (ALO/09/98)	0.233	300	0.078	2	69	Ears	0.53	0.29	0.82	22	# 1999/11509 421/0
						Ears	0.35	0.18	0.53	36	
						grain	≤ 0.02	< 0.02	< 0.04	42	
E - 41500 Alcala de Guadaira (ALO/08/98)	0.233	300	0.078	2	69	Ears	0.38	0.21	0.59	22	# 1999/11509 421/0
						Ears	0.13	0.09	0.22	37	
						grain	≤ 0.02	< 0.02	< 0.04	42	
E - 41500 Alcala de Guadaira (ALO/09/98)	0.233	300	0.078	2	69	Ears	0.48	0.22	0.70	22	# 1999/11509 421/0
						Ears	0.29	0.14	0.43	36	
						grain	≤ 0.02	< 0.02	< 0.04	42	
E - 41727 Maribanez (ALO/07/98)	0.233	300	0.078	2	69	Ears	0.40	0.10	0.50	21	# 1999/11509 421/0
						Ears	0.26	0.07	0.33	33	
						grain	≤ 0.02	< 0.02	< 0.04	42	
E - 41500 Alcala de Guadaira (ALO/08/98)	0.233	300	0.078	2	69	Ears	0.26	0.14	0.40	22	# 1999/11509 421/0
						Ears	0.12	0.06	0.18	37	
						grain	≤ 0.02	< 0.02	< 0.04	42	
F - Gajan (FR3/02/98) South	0.250	300	0.083	2	61	Ears	0.29	0.12	0.41	21	# 1999/11509 421/0
						Ears	0.14	0.05	0.19	35	
F - 30700 St. Maximin (FR3/05/99)	0.250	300	0.083	2	61	Ears	0.33	0.11	0.44	21	# 1999/11824 421/0
						grain	≤ 0.02	< 0.02	< 0.04	35	
						grain	< 0.02	< 0.02	< 0.04	42	

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	residues			PHI days	Trials number method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
F - 30700 St. Maximin (FR3/03/98)	0.250	300	0.083	2	59	Ears	0.10	0.02	0.12	21	# 1999/11825 421/0
						Ears	0.03	< 0.02	0.05	35	
						grain	≤ 0.02	< 0.02	< 0.04	43	
F - 62580 Neuville (South) Saint Vaast (FR2/03/98)	0.250	300	0.083	2	65	Ears	0.36	0.08	0.44	22	# 1999/11509 421/0
						Ears	0.19	0.05	0.24	32	
						grain	≤ 0.02	< 0.02	< 0.04	42	
						grain	< 0.02	< 0.02	< 0.04	50	
F – 30730 Gajan (FR3/02/98)	0.233	300	0.078	2	61	Ears	0.21	0.07	0.28	21	# 1999/11509 421/0
						Ears	0.06	0.02	0.08	35	
F - 62580 Neuville(South) Saint Vaast (FR2/03/98)	0.233	300	0.078	2	65	Ears	0.26	0.07	0.33	22	# 1999/11509 421/0
						Ears	0.14	0.04	0.18	32	
						grain	≤ 0.02	< 0.02	< 0.04	42	
						grain	< 0.02	< 0.02	< 0.04	50	
F - 30730 Gajan (FR3/02/98)	0.233	300	0.078	2	61	Ears	0.18	0.06	0.24	21	# 1999/11509 421/0
						Ears	0.06	0.02	0.08	35	
F - 62580 Neuville Saint Vaast (FR2/03/98)	0.233	300	0.078	2	65	Ears	0.19	0.05	0.24	22	# 1999/11509 421/0
						Ears	0.14	0.04	0.18	32	
						grain	≤ 0.02	< 0.02	< 0.04	42	
						grain	< 0.02	< 0.02	< 0.04	50	
D - 24625 Großharrie (D05/02/98)	0.233	300	0.078	2	69 - 71	Ears	0.22	0.06	0.28	21	# 1999/11509 421/0
						Ears	0.43	0.08	0.51	36	
						grain	≤ 0.02	< 0.02	< 0.04	42	
						grain	< 0.02	< 0.02	< 0.04	49	
D - 24625 Großharrie (D05/02/98)	0.250	300	0.083	2	69 - 71	Ears	0.27	0.08	0.35	21	# 1999/11509
						Ears	0.32	0.08	0.40	36	421/0
						grain	≤ 0.02	< 0.02	< 0.04	42	
						grain	< 0.02	< 0.02	< 0.04	49	
D - 88445 Oberding (D07/01/99)	0.250	300	0.083	2	69	Ears	0.24	0.07	0.31	20	# 1999/11824 421/0
						Grain	≤ 0.02	< 0.02	< 0.04	34	
						Grain	< 0.02	< 0.02	< 0.04	41	
D - 16356 Blumberg (ACK/02/98)	0.250	300	0.083	2	61	Ears	0.26	0.06	0.32	21	# 1999/11825 421/0
						Ears	0.15	0.03	0.18	35	
						Ears	0.10	0.03	0.13	42	
						grain	≤ 0.02	< 0.02	< 0.04	64	
D - 24625 Großharrie (D05/02/98) +epoxyconazole	0.233	300	0.078	2	69 - 71	Ears	0.21	0.06	0.27	21	# 1999/11509 421/0
						Ears	0.46	0.10	0.56	36	
						grain	≤ 0.02	< 0.02	< 0.04	42	
						grain	< 0.02	< 0.02	< 0.04	49	
NL - 5853 Siebengewal (AGR/04/98	0.250	300	0.083	2	69	Ears	0.45	0.09	0.54	20	# 1999/11509 421/0
						grain	0.04	< 0.02	0.06	35	
						grain	< 0.02	< 0.02	< 0.04	44	
						grain	< 0.02	< 0.02	< 0.04	51	
NL - 5853 Siebengewal (AGR/04/98)	0.233	300	0.078	2	69	Ears	0.34	0.08	0.42	20	# 1999/11509 EU/FR/01/98 421/0
						grain	≤ 0.02	< 0.02	< 0.04	35	
						grain	< 0.02	< 0.02	< 0.04	44	
						grain	< 0.02	< 0.02	< 0.04	51	
GB -AB30 1XJ Maykirk (OAT/01/98)	0.233	300	0.078	2	69 - 72	Ears	0.29	0.05	0.34	20	# 1999/11509 EU/FR/01/98 421/0
						grain	0.05	< 0.02	0.07	33	
						grain	0.03	< 0.02	0.05	47	
GB -AB30 1XJ Maykirk (OAT/01/98)	0.250	300	0.083	2	69 - 72	Ears	0.29	0.05	0.34	20	# 1999/11509 421/0
						grain	0.04	< 0.02	0.06	33	
						grain	< 0.02	< 0.02	< 0.04	47	
GB-TQ72BU Kinesbridge (OAT/08/99)	0.250	300	0.083	2	69	Ears	0.18	0.05	0.23	20	# 1999/11824 421/0
						grain	≤ 0.02	< 0.02	< 0.04	36	
						grain	< 0.02	< 0.02	< 0.04	43	
GB-NN13 6 DY- Brackley (OAT/09/99)	0.250	300	0.083	2	65	Ears	0.23	0.07	0.30	22	# 1999/11824 421/0
						grain	0.03	< 0.02	0.05	36	
						grain	< 0.02	< 0.02	< 0.04	42	
DK - 5500 Middelfart (ALB/01/99)	0.250	300	0.083	2	65 – 69	Ears	0.36	0.12	0.48	21	# 1999/11824 421/0
						grain	≤ 0.02	< 0.02	< 0.04	35	
						grain	< 0.02	< 0.02	< 0.04	42	

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	residues			PHI days	Trials number method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
S - 23791 Bjärred Borgeby Gard (HUS/04/98)	0.250	300	0.083	2	69	Ears	0.15	0.06	0.21	22	# 1999/11825 421/0
						grain	0.09	0.04	0.13	36	
						grain	< 0.02	< 0.02	< 0.04	42	
USA NC/2	0.224	190		2	16/4/98	grain	≤0.02	<0.02	<0.04	53	1999/5096 D9808
USA MO/04	0.224	67		2	1/5/98	grain	≤0.02	<0.02	<0.04	40	1999/5096 D9808
USA OK/6	0.224	194		2	22/4/98	grain	≤0.02	<0.02	<0.04	41	1999/5096 D9808
USA OK/8	0.224	196		2	22/4/98	grain	≤0.02	<0.02	<0.04	43	1999/5096 D9808
USA TX/8	0.224	264		2	5/5/98	grain	≤0.02	<0.02	<0.04	43	1999/5096 D9808
USA TX/8	0.224	264		2	5/5/98	grain	≤0.02	<0.02	<0.04	44	1999/5096 D9808
USA TX/8	0.224	186		2	22/4/98	grain	≤0.02	<0.02	<0.04	51	1999/5096 D9808
USA TX/8	0.224	190		2	29/4/98	grain	≤0.02	<0.02	<0.04	41	1999/5096 D9808
USA KS/8	0.224	94		2	12/5/98	grain	≤0.02 <0.02	<0.02 <0.02	<0.04 <0.04	40-47 54-68	1999/5096 D9808
USA NE/7	0.224	190		2	19/5/98	grain	≤0.02	<0.02	<0.04	45	1999/5096 D9808
USA MN/5	0.224	196		2	15/6/98	grain	≤0.02	<0.02	<0.04	42	1999/5096 D9808
USA MN/5	0.224	150		2	12/6/98	grain	≤0.02	<0.02	<0.04	41	1999/5096 D9808
USA MN/5	0.224	150		2	21/6/98	Grain	≤0.02 <0.02	<0.02 <0.02	<0.04 <0.04	40-47 54-68	1999/5096 D9808
USA ND/5	0.224	95		2	11/7/98	Grain	≤0.02	<0.02	<0.04	41	1999/5096 D9808
USA ND/7	0.224	95		2	8/7/98	Grain	≤0.02	<0.02	<0.04	43	1999/5096 D9808
USA ND/5	0.224	190		2	22/6/98	Grain	≤0.02	<0.02	<0.04	49	1999/5096 D9808
USA ND/7	0.224	140		2	25/6/98	Grain	≤0.02	<0.02	<0.04	47	1999/5096 D9808
USA ND/7	0.224	140		2	21/6/98	Grain	≤0.02	<0.02	<0.04	50	1999/5096 D9808
USA ND/7	0.224	140		2	22/6/98	Grain	≤0.02	<0.02	<0.04	46	1999/5096 D9808
USA SD/7	0.224	94		2	26/6/98	Grain	≤0.02	<0.02	<0.04	41	1999/5096 D9808
USA SD/7	0.224	94		2	26/6/98	Grain	≤0.02	<0.02	<0.04	47	1999/5096 D9808
USA ID/11	0.224	200		2	27/6/98	Grain	≤0.02	<0.02	<0.04	46	1999/5096 D9808
CANADA Alberta	0.224	340		2	6/7/98	Grain	≤0.02	<0.02	<0.04	49	1999/5096 D9808
CANADA Alberta	0.224	95		2	22/6/98	Grain	≤0.02	<0.02	<0.04	53	1999/5096 D9808
CANADA Alberta	0.224	95		2	22/6/98	Grain	≤0.02	<0.02	<0.04	57	1999/5096 D9808
CANADA Alberta	0.224	125		2	19/6/98	Grain	<0.02	<0.02	<0.04	50	1999/5096 D9808
CANADA Saskatchevan	0.224	110		2	2/8/98	Grain	≤ 0.02 ≤ 0.02	<0.02 < 0.02	< 0.04 <0.04	40-47 54-61	1999: 5096 98032
CANADA Alberta	0.224	125		2	19/6/98	Grain	≤0.02	<0.02	<0.04	51	1999/5096 D9808
CANADA Saskatchewan	0.224	150		2	13/7/98	Grain	≤0.02	<0.02	<0.04	46	1999/5096 D9808
CANADA Saskatchewan	0.224	160		2	14/7/98	Grain	≤0.02	<0.02	<0.04	45	1999/5096 D9808
CANADA Manitoba	0.224	200		2	8/7/98	Grain	≤0.02	<0.02	<0.04	40	1999/5096 D9808
CANADA Manitoba	0.224	200		2	17/7/98	Grain	≤0.02	<0.02	<0.04	40	1999/5096 D9808
CANADA Manitoba	0.224	110		2	23/7/98	Grain	≤0.02	<0.02	<0.04	47	1999/5096 D9808

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	residues			PHI days	Trials number method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
BR Santagro 2000/901	0.300	200	0.15	1	75	Grain	0.09	0.03	0.12	30	#2000/5241 D9908
	0.600	200	0.30	1	75		0.29	0.10	0.38	30	
BR/ BR2 2000/010	0.300	200	0.15	1	72-75	Grain	0.04	0.02	0.06	30	#2000/5241 D9908
	0.600	200	0.30	1	72-75		0.17	0.03	0.20	30	
BR Santagro 2000/009	0.300	200	0.15	1	72-75	Grain	0.36	<0.02	0.36	0	#2000/5241 D9908 2003/1013066
							0.37	0.04	0.41	7	
							0.09	<0.02	0.09	15	
							0.13	0.05	0.17	30	
							<0.02	<0.02	<0.04	45	
BR/BR5 2000/012	0.300	200	0.15	1	77-82	Grain	<0.02	<0.02	<0.04	30	#2000/5241 D9908
	0.600	200	0.30	1	77-82		<0.02	<0.02	<0.04	30	
BR/santagro 2000/024	0.200	200	0.1	1	77-82	Grain	0.03	<0.02	0.04	30	#2000/5236 D9908
	0.400	200	0.2	1	77-82		0.17	0.04	0.21	30	
BR 2000/022	0.200	200	0.1	1	72-75	Grain	0.04	0.02	0.06	30	#2000/5236
	0.400	200	0.2	1	72-75		0.10	0.05	0.14	30	D9908
BR 2000/023	0.200	200	0.1	1	77-82	grain	0.02	<0.02	<0.04	30	#2000/5236 D9908
	0.400	200	0.2	1	77-82	grain	0.04	0.02	0.06	30	
BR/santagro 2000/021	0.200	200	0.1	1	77/82	Grain	0.37	<0.02	0.37	0	#2000/5236 D9908
							0.37	0.04	0.41	7	
							0.09	<0.02	0.10	15	
							0.04	0.02	0.06	30	
							<0.02	<0.02	<0.04	45	

Table 77. Pyraclostrobin residues in barley resulting from supervised trials in the USA, Canada, Europe and Brazil.

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	residues			PHI days	Trials number method
	Kg ai/ha	Water l/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
B - 3470 Kortenaken (AGR/05/98)	0.250	300	0.083	2	61	Ears	0.26	0.10	0.36	20	# 1999/11509 421/0
						Grain	0.04	0.03	0.07	34	
						Grain	0.05	0.02	0.07	40	
B - 3470 Kortenaken (AGR/05/98)	0.233	300	0.078	2	61	ears	0.29	0.11	0.40	20	# 1999/11509 421/0
						grain	≤ 0.02	< 0.02	< 0.04	34	
						grain	< 0.02	< 0.02	< 0.04	40	
D - 67149 Meckenheim (DU2/05/98)	0.250	300	0.083	2	59	ears	0.18	0.05	0.23	20	# 1999/11509 421/0
						grain	< 0.02	< 0.02	< 0.04	35	
						grain	0.02	< 0.02	0.04	41	
D - 67149 Meckenheim (DU2/08/98)	0.250	300	0.083	2	59	ears	0.21	0.05	0.26	22	# 1999/11825 421/0
						grain	0.04	< 0.02	0.06	35	
						grain	0.03	< 0.02	0.05	41	
D - 24625 Großharrie (D05/03/99)	0.250	300	0.083	2	61	ears	0.37	0.14	0.51	20	# 1999/11824 421/0
						ears	0.15	0.07	0.22	34	
						grain	0.09	0.04	0.13	42	
D - 67149 Meckenheim (DU2/05/98)	0.233	300	0.078	2	59	ears	0.18	0.06	0.24	20	# 1999/11509 421/0
						grain	0.03	< 0.02	0.05	35	
						grain	0.03	< 0.02	0.05	41	
S - 23791 Bjärred Borgeby Gard (HUS/03/98)	0.250	300	0.083	2	59	ears	0.11	0.05	0.16	22	# 1999/11509 421/0
						ears	0.06	0.04	0.10	35	
						grain	≤ 0.02	< 0.02	< 0.04	42	
S - 23791 Bjärred Borgeby Gard (HUS/02/99)	0.250	300	0.083	2	69	ears	1.91	0.52	2.43	21	# 1999/11824 421/0
						grain	0.29	0.08	0.37	35	
						grain	0.22	0.08	0.30	43	
S - 23791 Bjärred Borgeby Gard (HUS/05/98)	0.250	300	0.083	2	59	ears	0.10	0.05	0.15	22	# 1999/11825 421/0
						ears	0.08	0.04	0.12	36	
						grain	0.03	< 0.02	0.05	42	

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	residues			PHI days	Trials number method
	Kg ai/ha	Water l/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
S - 22251 Lund	0.250	300	0.083	2	59	ears	0.05	0.02	0.07	28	2001/1009068 445/0
						ears	0.04	0.02	0.06	35	
						ears	0.08	0.04	0.12	42	
						grain	< 0.02	< 0.02	< 0.04	49	
S - 23791 Bjärred Borgeby Gard (HUS/03/98)	0.233	300	0.078	2	59	ears	0.12	0.06	0.18	22	# 1999/11509 421/0
						ears	0.06	0.04	0.10	35	
						grain	0.03	< 0.02	0.05	42	
F - 51500 Tassy	0.25	300	0.083	2	59	Grain	0.32	0.21	0.53	34	2001/1009068 445/0
F - 26750 Saint Paul les romans	0.25	300	0.083	2	59	Grain	≤0.02	<0.02	<0.04	42	2002/1004077 445/0
F - 40700 Sainte Colombe Aquitaine (A 1050 SA)	0.250	300	0.083	2	59	Ears	0.44	0.08	0.53	20	2002/1004077 445/0
						Ears	0.07	<0.02	0.09	28	
						Grain	0.10	0.03	0.13	35	
						Grain	0.07	0.02	0.09	42	
F - 47120 Duras Aquitaine (A 1050 DR)	0.250	300	0.083	2	59	Ears	0.15	0.08	0.22	21	2002/1004077 445/0
						Grain	0.05	0.55	1.72	35	
						Ears	<0.02	<0.02	<0.04	35	
						Grain	0.04	0.04	0.08	42	
F - 62580 Neuville South Saint Vaast (FR2/05/99)	0.250	300	0.083	2	69	Ears	0.12	0.13	0.25	21	# 1999/11824 421/0
						Grain	0.04	0.03	0.07	35	
						Grain	0.03	0.03	0.06	43	
F - 31870 Lagardere sur Leze Midi- (A 1050)	0.250	300	0.083	2	59	Ears	0.11	0.06	0.17	22	2002/1004077 445/0
						Ears	0.07	0.04	0.11	29	
						Grain	0.03	0.02	0.05	36	
						Grain	0.03	<0.02	0.05	43	
F - 47120 Duras Aquitaine (A 1050 DR)	0.250	300	0.083	2	59	Ears	1.01	0.52	1.53	21	2002/1004077 445/0
						Grain	0.06	0.04	0.10	27	
						Grain	0.05	0.04	0.09	36	
						Grain	0.07	0.05	0.12	42	
GB - CV9 2JS Bentley. Atherstone (OAT/03/98)	0.250	300	0.083	2	65	Ears	0.37	0.08	0.45	21	# 1999/11509 421/0
						Grain	0.06	< 0.02	0.08	35	
						Grain	0.07	< 0.02	0.09	42	
GB - NN13 6DY Hillfarm. Halse Nr. Brackley (OAT/02/98)	0.250	300	0.083	2	59	Ears	0.39	0.14	0.53	22	# 1999/11509 421/0
						Grain	0.04	< 0.02	0.06	35	
						Grain	0.04	0.02	0.06	42	
GB - CV9 2JS Atherstone (OAT/10/99)	0.250	300	0.083	2	65	Ears	0.17	0.04	0.21	20	# 1999/11824 421/0
						Grain	0.07	< 0.02	0.09	35	
						Grain	0.07	< 0.02	0.09	42	
GB - LN9 6PX Salmonby (BSF/623-3)	0.250	300	0.083	2	61	Ears	0.09	0.03	0.12	28	2001/1009068 445/0
						Ears	0.07	0.02	0.09	35	
						Ears	0.03	<0.02	0.05	42	
						Ears	0.02	<0.02	0.04	49	
						Grain	0.03	<0.02	0.05	56	
						Grain	0.03	<0.02	0.05	64	
E - 41799 Trajano (ALO/03/99)	0.250	300	0.083	2	63 - 65	Ears	0.16	0.08	0.24	21	# 1999/11824 421/0
						Ears	0.29	0.15	0.44	34	
						Grain	0.03	< 0.02	0.05	41	
E - 21880 Paterna (ALO/04/99)	0.250	300	0.083	2	61 - 63	Ears	0.15	0.07	0.22	21	# 1999/11824 421/0
						Grain	0.05	0.03	0.08	35	
						Grain	0.03	0.02	0.05	43	
E - 21880 Paterna (ALO/05/99)	0.250	300	0.083	2	59 - 61	Ears	0.59	0.33	0.92	21	# 1999/11824 421/0
						Grain	0.02	< 0.02	0.04	35	
USA A/1 Germansville	0.224	305		2	13/6/98	Grain	0.14	0.05	0.19	47	1999: 5079 D9808
USA MN/5 Theilman	0.224	190		2	15/6/98	Grain	0.05	<0.02	0.07	42	1999: 5079 D9808

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	residues			PHI days	Trials number method
	Kg ai/ha	Water l/ha	kg as/hl	No of tr.			mg/kg parent	mg/kg 500M07	total		
USA MN/5 Hollandale	0.224	150		2	15/6/98	Grain	< 0.02	<0.02	< 0.04	43	1999: 5079 D9808
USA MN/5 Campbell	0.224	140		2	21/6/98	Grain	0.03	<0.02	0.05	40	1999: 5079 D9808
USA SD/7 Barnad	0.224	95		2	22/6/98	Grain	< 0.02	<0.02	< 0.04	45	1999: 5079 D9808
USA ND/7 Jameston	0.224	95		2	1/7/98	Grain	< 0.02	<0.02	< 0.04	43	1999: 5079 D9808
USA ND/7 New Rocford	0.224	140		2	25/6/98	Grain	< 0.02	<0.02	< 0.04	43	1999: 5079 D9808
USA ND/7 Velva	0.224	140		2	21/6/98	Grain	< 0.02	<0.02	< 0.04	45	1999: 5079 D9808
USA CO/9 Delta	0.224	185		2	8/7/98	Grain	< 0.02	<0.02	< 0.04	63	1999: 5079 D9808
USA CA/10 Porterville	0.224	290		2	21/6/98	Grain	< 0.02	<0.02	< 0.04	43	1999: 5079 D9808
USA ID/11 Jerome	0.224	190		2	20/6/98	Grain	0.07	0.02	0.09	53	1999: 5079 D9808
USA WA/11 Ephrata	0.224	190		2	8/6/98	Grain	< 0.02	<0.02	< 0.04	52	1999: 5079 D9808
USA QB/5B St Cesaire	0.224	275		2	16/6/98	Grain	< 0.02	<0.02	< 0.04	42	1999: 5079 D9808
CANADA Alberta	0.224	100		2	8/7/98	Grain	< 0.02	<0.02	< 0.04	49	1999: 5096 98032
CANADA Alberta	0.224	100		2	28/7/98	Grain	< 0.02	<0.02	< 0.04	53	1999: 5096 98032
CANADA Alberta	0.224	200		2	9/7/98	Grain	< 0.02	<0.02	< 0.04	57	1999: 5096 98032
CANADA Alberta	0.224	120		2	29/6/98	Grain	< 0.02	<0.02	< 0.04	50	1999: 5096 98032
CANADA Alberta	0.224	120		2	25/6/98	Grain	< 0.02	<0.02	< 0.04	51	1999: 5096 98032
CANADA Saskatchevan	0.224	110		2	26/6/98	Grain	< 0.02 < 0.02	<0.02 < 0.02	< 0.04 <0.04	40 54	1999: 5096 98032
CANADA Saskatchevan	0.224	110		2	7/8/98	Grain	< 0.02	<0.02	< 0.04	41	1999: 5079 D9802
CANADA Saskatchevan	0.224	150		2	13/7/98	Grain	0.03	<0.02	0.05	42	1999: 5079 D9808
CANADA Manitoba	0.224	110		2	1/8/98	Grain	< 0.02	<0.02	< 0.04	55	1999: 5079 D9808
CANADA Manitoba	0.224	110		2	14/7/98	Grain	< 0.02	<0.02	< 0.04	41	1999: 5079 D9808
CANADA Manitoba	0.224	200		2	8/7/98	Grain	< 0.02	<0.02	< 0.04	40	1999: 5079 D9808
CANADA Manitoba	0.224	200		2	16/7/98	Grain	0.03	<0.02	0.05	40	1999: 5079 D9808
BR Santagro 2000/900	0.200	200	0.1	1	77	Grain	0.07	0.03	0.10	30	#2000/5241 D9908
	0.400	200	0.2	1	77	Grain	0.21	0.07	0.28	30	
BR Santagro 2000/008	0.200	200	0.1	1	73	Grain	0.04	0.03	0.07	30	#2000/5241 2003/1016066
	0.400	200	0.2	1	73	Grain	0.19	0.16	0.35	30	
BR 2000/006	0.200	200	0.1	1	82-86	Grain	0.08	0.08	0.16	30	#2000/5241 D9908
	0.400	200	0.2	1	82-86	Grain	0.11	0.10	0.21	30	
BR Santagro 2000/005	0.200	200	0.1	1	77	grain	0.80	0.02	0.82	0	#2000/5241 D9908
							0.37	0.14	0.52	7	
							0.32	0.15	0.48	15	
							0.08	0.03	0.10	30	
							0.05	0.04	0.09	45	
BR Santagro 2000/017	0.166	200	0.083	1	77	grain	0.92	0.02	0.94	0	#2000/5236 D9908
							0.21	0.11	0.32	7	
							0.36	0.18	0.53	15	
							0.06	0.02	0.08	30	
							0.04	0.02	0.06	45	
BR Santagro 2000/902	0.166	200	0.083	1	77	Grain	0.08	0.02	0.10	30	#2000/5236 D9908
	0.333	200	0.166	1	77	Grain	0.15	0.04	0.19	30	

Location	Appl. per treatment Kg ai/ha	Water l/ha	kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	residues mg/kg parent	mg/kg 500M07	total	PHI days	Trials number method
BR Santagro 2000/020	0.166	200	0.083	1	82_86	Grain	0.09	0.05	0.14	30	#2000/5236 D9908
	0.333	200	0.166	1	82-86	Grain	0.56	0.20	0.76	30	
BR/BR2 2000/018	0.166	200	0.083	1	77	Grain	0.05	0.05	0.11	30	#2000/5236 D9908
	0.333	200	0.166	1	77	Grain	0.02	0.02	0.04	30	

Table 78. Pyraclostrobin residues in rye resulting from supervised trials in the USA.

Location	Appl. per treatment Kg ai/ha	Water l/ha	kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	Residues mg/kg parent	Mg/kg 500M07	total	PHI days	Trials number method
VA/2 Dublin	0.224	285		2	6/5/98	grain	<0.02	<0.02	<0.04	66	1999/5107 D9808
SD/5 Britton	0.224	95		2	28/5/98	grain	<0.02	<0.02	<0.04	58	1999/5107 D9808
KS/5 Hudson	0.224	190		2	30/4/98	grain	<0.02	<0.02	<0.04	55	1999/5107 D9808
ND/7 Minot	0.224	140		2	29/5/98	grain	<0.02	<0.02	<0.04	59	1999/5107 D9808
ND/7 Upham	0.224	140		2	29/5/98	grain	<0.02	<0.02	<0.04	59	1999/5107 D9808

Table 79. Pyraclostrobin residues in maize resulting from supervised trials in Brazil.

Location	Appl. per treatment Kg ai/ha	Water l/ha	kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	Residues mg/kg parent	Mg/kg 500M07	total	PHI days	Trials number method
BR/BRU 2000/147	0.200	300	0.067	1 11/04/00	83	grain	<0.02	<0.02	<0.04	45	#2000/5241 D9908
	0.400	300	0.133	1 11/04/00	83	grain	<0.02	<0.02	<0.04	45	
BR/BRV 2000/148	0.200	300	0.067	1 07/04/00	75	grain	<0.02	0.02	<0.04	14	#2000/5241 D9908
	0.400	300	0.133	1 07/04/00	75	grain	<0.02	0.02	<0.04	14	
BR/BRT 2000/149	0.200	300	0.067	1 11/04/00	79	grain	<0.02	0.02	<0.04	14	#2000/5241 D9908
	0.400	300	0.133	1 11/04/00	79	grain	<0.02	0.02	<0.04	14	
BR/BRT 2000/150	0.200	300	0.067	1	97	grain	<0.02	<0.02	<0.04	0	#2000/5241 D9908
					87		<0.02	<0.02	<0.04	15	
					83		<0.02	<0.02	<0.04	30	
					77		<0.02	<0.02	<0.04	45	
					73		<0.02	<0.02	<0.04	60	
BR/BRT 2000/151	0.133	300	0.044	1	79	grain	<0.02	<0.02	<0.04	45	#2000/5236 D9908
	0.266	300	0.089	1	79	grain	<0.02	<0.02	<0.04	45	
BR/BRV 2000/154	0.133	300	0.044	1	75	grain	<0.02	<0.02	<0.04	45	#2000/5236 D9908
	0.266	300	0.089	1	75	grain	<0.02	<0.02	<0.04	45	
BR/BRU 2000/153	0.133	300	0.044	1	83	grain	<0.02	<0.02	<0.04	45	#2000/5236 D9908
	0.266	300	0.089	1	83	grain	<0.02	<0.02	<0.04	45	
BR/BRT 2000/152	0.133	300	0.044	1		grain	<0.02	<0.02	<0.04	0	#2000/5236 D9908
						grain	<0.02	<0.02	<0.04	15	
						grain	<0.02	<0.02	<0.04	30	
						grain	<0.02	<0.02	<0.04	45	
						grain	<0.02	<0.02	<0.04	60	

Table 80. Pyraclostrobin residues in coffee resulting from supervised trials in Brazil

Location	Appl. per treatment				Growth stage at last tr.	Portion analysed	Residues			PHI days	Trials number method
	Kg ai/ha	Water l/ha	kg as/hl	No of tr.			mg/kg parent	Mg/kg 500M07	total		
BR Santo Antonio De Posse-SP	0.175	500	0.035	2 18/05/00	85	RAC	0.03	<0.02	0.05	45	2001/5002355 D 9908
	0.350	500	0.070		85	RAC	<0.02	<0.02	<0.04	45	
BRAraguari MG129 BR	0.175	500	0.035	2 04/04/00	85	RAC	<0.02	<0.02	<0.04	45	# 2001/5002355 D 9908
	0.350	500	0.070		85	RAC	0.08	<0.02	0.10	45	
BR Romaria-MG CDR/F/2000 130 BRV	0.175	500	0.035	2 30/03/00	89	RAC	0.12	<0.02	0.14	0	# 2001/5002355 D 9908
					89	RAC	<0.02	<0.02	<0.04	15	
					89	RAC	<0.02	<0.02	<0.04	30	
					89	RAC	<0.02	<0.02	<0.04	45	
					89	RAC	0.11	<0.02	0.13	60	
BR Miraselva-P 127 BRT	0.175	500	0.035	2	87	RAC	0.15	<0.02	0.17	45	# 2001/5002355 D 9908
	0.350	500	0.070	20/04/00	87	RAC	0.12	0.02	0.14	45	

Table 81. Pyraclostrobin residues in fodder beet tops resulting from supervised trials in the USA and Europe.

Location	Appl. per treatment			No of tr.	Growth stage at last tr.	Portion analysed	residues			PHI days	trials number method
	kg ai/ha	Water l/ha	kg as/hl				mg/kg parent	mg/kg 500M07	total		
USA williamston Michigan	0.224	245	0.091	4 23/09/	Mature	tops	1.35	0.51	1.86	7	# 1999/5157 421/0 (g)
USA Geneva. Freeborn Co Minnesota..	0.224	189	0.119	4 22/09/	Vegetative	tops	3.90	0.51	4.41	0	# 1999/5157 421/0 (g)
							2.62	0.82	3.44	7	
							1.51	0.35	1.86	14	
							1.26	0.58	1.84	21	
							0.83	0.45	1.28	28	
USA Campbell. Wilkin Co.. Minnesota	0.224	189	0.119	4 28/09/	26 leaf	tops	2.02	0.48	2.50	7	# 1999/5157 421/0 (g)
USA Northwood Grand Forks. North Dakota	0.224	232	0.097	4 08/10/	25-30 leaf	tops	1.58	0.24	1.72	7	# 1999/5157 421/0 (g)
USA Arkansaw Pepin Co.. Wisconsin	0.224	187	0.120	4 24/09/	Root Develop.	tops	2.28	0.52	2.80	7	# 1999/5157 421/0 (g)
USA Velva. McHenry co North Dakota	0.224	147	0.152	4 23/09/	8´´diam.	tops	1.33	0.32	1.65	8	# 1999/5157 421/0 (g)
USA Levelland. Hockley Co.. Texas	0.224	240	0.093	4 11/10/	Maturing Roots	tops	1.47	0.46	1.93	7	# 1999/5157 421/0 (g)
USA Fruita. Mesa Co.. Colorado	0.224	284	0.079	4 29/09/	Harvest	roots	1.68	0.43	2.11	7	# 1999/5157 421/0 (g)
USA Chico. Butte Co.. California	0.224	255	0.088	4 24/08/	Beet Develop.	tops	5.30	1.61	6.91	7	# 1999/5157 421/0 (g)
USA Madera. Madera Co.. California	0.224	285	0.079	4 07/10/	Mature	tops	3.14	0.95	4.09	7	# 1999/5157 421/0 (g)
USA Jerome. Jerome Co.. Idaho	0.224	187	0.120	4 14/09/	BBCH 42	tops	0.28	0.17	0.45	7	# 1999/5157 421/0 (g)
USA Payette. Payette Co.. Idaho	0.224	273	0.082	4 06/10/	Mature	tops	1.46	0.47	1.93	7	# 1999/5157 421/0 (g)
B-3470 Kortenaken AGR/13/01	0.125	300	0.042	2 06/08/	39	Tops	1.22	0.03	1.25	0	#2002/1004108 445/0
							0.07	<0.02	0.09	28	
							<0.02	<0.02	<0.04	43	

Location	Appl. per treatment			No of tr.	Growth stage at last tr.	Portion analysed	residues			PHI days	trials number method
	kg ai/ha	Water l/ha	kg as/hl				mg/kg parent	mg/kg 500M07	total		
B-3470 Kortenaken LZ4 Limburg AGR/13/01	0.133	300	0.044	2 06/08/	39	Tops	2.04	0.05	2.09	0	#2002/1004108 445/0
							0.07	0.03	0.10	28	
							0.03	<0.02	0.05	43	
NL-6595 Ottersum AGR/14/01	0.125	300	0.042	2 07/08/	39	Tops	1.88	0.05	1.93	0	#2002/1004108 445/0
							0.04	<0.02	0.06	27	
							<0.02	<0.02	<0.04	41	
NL-6595 Ottersum MS Limburg AGR/14/01	0.133	300	0.044	2 07/08/ 01	39	Tops	3.57	0.06	3.63	0	#2002/1004108 445/0
							0.04	<0.02	0.06	27	
							0.04	<0.02	0.06	41	
D-74193 Stetten a. H. DU2/10/01	0.125	300	0.042	2 10/08/	38	tops	1.75	0.15	1.90	0	#2002/1004108 445/0
							0.06	0.10	0.16	28	
							0.03	0.07	0.10	42	
D-74193 Stetten a. H. Baden Wuerttembeg DU2/10/01	0.133	300	0.044	2 10/08/	38	Tops	2.70	0.16	2.86	0	#2002/1004108 445/0
							0.10	0.11	0.21	28	
							0.04	0.08	0.12	42	
F-67160 Seebach FAN/02/01	0.125	300	0.042	2 03/09/	39	tops	2.05	0.15	2.20	0	#2002/1004108 445/0
							0.10	0.04	0.14	28	
							0.08	0.05	0.13	42	
F-67160 Seebach Alsace FAN/02/01	0.133	300	0.044	2 03/09/ 01	39	tops	2.42	0.14	2.56	0	#2002/1004108 445/0
							0.18	0.08	0.26	28	
							0.12	0.04	0.16	42	

Table 82. Pyraclostrobin residues in vines and hay peas from supervised trials in the USA and Canada.

Location	Appl. per treatment					Residues					trials number method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	mg/kg parent	mg/kg 500M07	total	PHI days	
USAFergus Falls Ottertail Co.. Minnesota	0.224	190	0.118	2	Beginning Pod 02/07/99	vines	7.03	1.60	8.63	0	# 1999/5154 421/0 (g)
						hay	18.0	5.58	23.58	0	
USA Campbell. Wilkin Co.. Minnesota	0.224	190	0.118	2	Beginning Pod 01/07/99	v ines	5.08	0.69	5.77	0	# 1999/5154 421/0 (g)
							2.95	1.34	4.29	3	
							1.39	1.09	2.48	6	
							1.51	0.60	2.11	9	
							1.82	1.50	3.32	12	
						hay	7.19	2.24	9.43	0	
							5.56	3.52	9.04	3	
							3.83	2.92	6.75	6	
							3.15	2.50	5.65	9	
							2.68	2.23	4.91	12	
Canada Red Deer. Alberta	0.224	95	0.236	2	50% pod 09/08/99	vines	3.84	0.51	4.35	0	# 1999/5154 421/0 (g)
						hay	6.44	1.10	7.54	0	
Canada Lacombe. Alberta	0.224	95	0.236	2	Pods 10-20%fill 17/08/99	vines	4.22	0.45	4.67	0	# 1999/5154
						hay	12.02	3.31	15.33	0	
Canada Blaine Lake. Saskatchewa	0.224	114	0.196	2	Beginning Pod develop 03/08/99	vines	5.05	2.14	7.19	2	# 1999/5154 421/0 (g)
						hay	4.87	3.12	7.99	2	
Canada Wakaw. Hoodoo Co.. Saskatchewan	0.224	114	0.196	2	Flowering/ Beginning pod filling 03/08/99	vines	5.46	1.77	7.23	2	# 1999/5154 421/0 (g)
						hay	5.27	2.66	7.93	2	
Canada Minto. Whitewater Manitoba	0.224	102	0.220	2	Ripe peas 05/08/99	vines	5.49	1.62	7.11	1	# 1999/5154 421/0 (g)
						hay	9.16	2.83	11.99	1	

Location	Appl. per treatment					Residues					trials number method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	mg/kg parent	mg/kg 500M07	total	PHI days	
Canada Minto. Whitewater Manitoba	0.224	102	0.220	2	End flower early ripening	vines	3.26	1.46	4.72	2	# 1999/5154 421/0 (g)
						Hay	7.52	3.70	11.22	2	

Table 83. Pyraclostrobin residues in peanut hay from supervised trials in the USA.

Location	Appl. per treatment					Residues					trials number method
	kg ai/ha	Water l/ha	kg as/hl	No of tr.	Growth stage at last tr. or date	Portion analysed	mg/kg parent	mg/kg 500M07	Total	PHI days	
Rose Hill. Sampson .. North Carolina (RCN 98045)	0.28	190	0.147	5	11/09/98	peanut. Hay	14.62	1.52	16.14	0	# 1999/5078 421/0 (g)
							13.36	2.74	16.12	7	
							10.25	2.27	12.02	14	
							19.44	4.65	24.09	21	
							5.94	1.53	7.47	28	
							5.64	1.49	7.13	28	
Elko. Barnwell Sth Carolina (RCN 98046)	0.28	191	0.147	5	07/10/98	peanut. Hay	14.92	3.47	18.39	14	# 1999/5078 421/0 (g)
Chula. Tift Co.. Georgia (RCN 98047)	0.28	366	0.077	5	Pod fill / Maturation 17/09/98	peanut. Hay	9.05	2..35	11.40	14	# 1999/5078 421/0 (g)
Columbia. Alabama (RCN 98048)	0.28	178	0.157	5	Pod fill / Maturation 27/08/98	peanut. Hay	18.36	4.10	22.46	14	# 1999/5078 421/0 (g)
Vernon. Wilbarger Texas (RCN 98049)	0.28	177	0.158	5	24/09/98	peanut. Hay	14.03	4.92	18.95	14	# 1999/5078 421/0 (g)
Seven spring Wayne Co.. N. Carolina (RCN 97123)	0.28	95	0.295	5	Fruit filling 23/09/97	peanut. Hay	5.82	1.09	6.91	7	# 1999/5071 421/0 (g)
							4.92	1.09	6.01	14	
							4.81	0.80	5.61	21	
							5.83	1.47	7.30	14	
							5.04	0.80	5.84	28	
Elko. Barnwell S. Carolina	0.28	96	0.292	5	03/10/97	peanut. Hay	18.69	3.34	22.03	14	# 1999/5071 421/0 (g)
Montezuma. Macon Co.. Georgia	0.28	95	0.295	5	18/09/97	peanut. Hay	4.77	1.06	5.83	14	# 1999/5071 421/0 (g)
Chula. Tift Co..Georgia	0.28	95	0.295	5	11/09/97	peanut. Hay	3.32	0.87	4.19	14	# 1999/5071 421/0 (g)
Malone. Jackson Co.. Florida	0.28	96	0.292	5	19/09/97	peanut. Hay	4.04	1.37	5.41	14	# 1999/5071 421/0 (g)
Levelland. Hockley Co.. Texas	0.28	95	0.295	5	Maturing 20/10/97	peanut. Hay	1.52	0.06	1.58	14	# 1999/5071 421/0 (g)
Eakly. Caddo Co.. Oklahoma (RCN 97129)	0.28	96	0.292	5	Mature 25/09/97	peanut. Hay	24.52 (h)	7.8	32.32	18	# 1999/5071 421/0 (g)

Table 84. Pyraclostrobin residues in wheat straw and plantsfrom supervised trials in the USA, Canada and Europe.

Location	Appl. per treatment					Residues					trials number method
	kg ai/ha	Water l/ha	Kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	mg/kg parent	mg/kg 500M 07	total	PHI days	
E – 41500 Alcala de Guadaira (ALO/09/98)	0.250	300	0.083	2	69	pl. w/o roots	7.79	0.30	8.09	0	# 1999/11509 421/0
						haulms	0.92	0.27	1.19	22	
						haulms	0.67	0.17	0.84	36	
						straw	1.44	0.52	1.96	42	
E – 41727 Maribanez (ALO/07/98)	0.250	300	0.083	2	69	pl. w/o roots	9.07	0.76	9.83	0	# 1999/11509 421/0
						haulms	3.20	0.74	3.94	21	
						haulms	2.43	0.71	3.14	33	
						straw	5.53	1.80	7.33	42	
E - 41500 Alcala de Guadaira (ALO/08/98)	0.250	300	0.083	2	69	pl. w/o roots	4.18	0.12	4.30	0	# 1999/11509 421/0
						haulms	0.74	0.17	0.91	22	
						haulms	0.44	0.12	0.56	37	
						straw	1.53	0.61	2.14	42	
E – 41500 Alcala de Guadaira (ALO/09/98)	0.233	300	0.078	2	69	pl. w/o roots	6.70	0.34	7.04	0	# 1999/11509 421/0
						haulms	1.38	0.56	1.94	22	
						haulms	1.30	0.54	1.84	36	
						straw	2.20	0.99	3.19	42	
E – 41727 Maribanez (ALO/07/98)	0.233	300	0.078	2	69	pl. w/o roots	10.30	0.62	10.92	0	# 1999/11509 421/0
						haulms	2.66	0.80	3.46	21	
						haulms	1.99	0.64	2.63	33	
						straw	4.95	1.77	6.72	42	
E – 41500 Alcala de Guadaira (ALO/08/98)	0.233	300	0.078	2	69	pl. w/o roots	6.22	0.19	6.41	0	# 1999/11509 421/0
						haulms	0.85	0.21	1.06	22	
						haulms	0.64	0.19	0.83	37	
						straw	1.67	0.61	2.28	42	
E – 41500 Alcala de Guadaira (ALO/09/98)	0.233	300	0.078	2	69	pl. w/o roots	6.62	0.19	6.81	0	# 1999/11509 421/0
						haulms	1.54	0.63	2.17	22	
						haulms	1.12	0.46	1.58	36	
						straw	1.85	0.87	2.72	42	
E - 41727 Maribanez (ALO/07/98)	0.233	300	0.078	2	69	pl. w/o roots	10.90	0.59	11.49	0	# 1999/11509 421/0
						haulms	2.71	0.55	3.26	21	
						haulms	2.01	0.53	2.54	33	
						straw	5.68	1.54	7.22	42	
E - 41500 Alcala de Guadaira (ALO/08/98)	0.233	300	0.078	2	69	pl. w/o roots	6.34	0.10	6.44	0	# 1999/11509 421/0
						haulms	0.89	0.14	1.03	22	
						haulms	0.63	0.11	0.74	37	
						straw	1.73	0.56	2.29	42	
F - 30730 Gajan South (FR3/02/98)	0.250	300	0.083	2	61	pl. w/o roots	5.75	0.21	5.96	0	# 1999/11509 421/0
						haulms	1.21	0.54	1.75	21	
						haulms	1.93	0.64	2.57	35	
F - 30700 St. Maximin (FR3/05/99) South	0.250	300	0.083	2	61	pl. w/o roots	5.41	0.08	5.49	0	# 1999/11824 421/0
						haulms	1.33	0.36	1.69	21	
						straw	2.07	0.61	2.68	35	
						straw	1.90	0.58	2.48	42	
F - 30700 St. Maximin (FR3/03/98) South	0.250	300	0.083	2	59	pl. w/o roots	7.77	0.53	8.30	0	# 1999/11825 421/0
						haulms	0.81	0.19	1.00	21	
						haulms	0.40	0.10	0.50	35	
						straw	0.75	0.26	1.01	43	
F - 62580 Neuville Saint Vaast (FR2/03/98) South	0.250	300	0.083	2	65	pl. w/o roots	4.92	0.12	5.04	0	# 1999/11509 421/0
						haulms	0.52	0.11	0.63	22	
						haulms	0.25	0.08	0.33	32	
						straw	3.14	0.24	3.38	42	
						straw	2.47	0.20	2.67	50	
F - 30730 Gajan South (FR3/02/98)	0.233	300	0.078	2	61	pl. w/o roots	4.69	0.14	4.83	0	# 1999/11509 421/0
						haulms	0.96	0.21	1.17	21	
						haulms	0.76	0.21	0.97	35	
F - 62580 Neuville	0.233	300	0.078	2	65	pl. w/o roots	6.49	0.12	6.61	0	# 1999/11509 421/0
						haulms	0.62	0.11	0.73	22	

Location	Appl. per treatment					Residues					trials number method
	kg ai/ha	Water l/ha	Kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	mg/kg parent	mg/kg 500M 07	total	PHI days	
Saint Vaast (FR2/03/98) South						haulms	0.23	0.07	0.30	32	
						straw	1.00	0.22	1.22	42	
						straw	1.91	0.88	2.79	50	
F - 30730 Gajan South (FR3/02/98)	0.233	300	0.078	2	61	pl. w/o roots	3.85	0.09	3.94	0	# 1999/11509 421/0
						haulms	0.75	0.14	0.89	21	
						haulms	0.59	0.10	0.69	35	
F - 62580 Neuville Saint Vaast (FR2/03/98) South	0.233	300	0.078	2	65	pl. w/o roots	4.06	0.07	4.13	0	# 1999/11509 421/0
						haulms	0.56	0.10	0.66	22	
						haulms	0.23	0.06	0.29	32	
						straw	1.22	0.21	1.43	42	
						straw	2.05	0.25	2.30	50	
D - 24625 Großharrie (D05/02/98)	0.250	300	0.083	2	69 - 71	pl. w/o roots	5.35	0.15	5.50	0	# 1999/11509 421/0
						haulms	0.93	0.12	1.05	21	
						haulms	1.42	0.16	1.58	36	
						straw	2.23	0.52	2.75	42	
						straw	1.45	0.47	1.92	49	
D - 88445 Oberding (D07/01/99)	0.250	300	0.083	2	69	pl. w/o roots	4.71	0.10	4.81	0	# 1999/11824 421/0
						Haulms	1.55	0.33	1.88	20	
						Straw	1.10	0.44	1.54	34	
						straw	1.16	0.45	1.61	41	
D - 16356 Blumberg (ACK/02/98)	0.250	300	0.083	2	61	pl. w/o roots	8.93	0.18	9.11	0	# 1999/11825 421/0
						haulms	0.77	0.21	0.98	21	
						haulms	0.94	0.31	1.25	35	
						haulms	0.66	0.27	0.93	42	
						straw	0.67	0.21	0.88	64	
D - 24625 Großharrie (D05/02/98)	0.233	300	0.078	2	69 - 71	pl. w/o roots	5.75	0.12	5.87	0	# 1999/11509 421/0
						haulms	0.87	0.10	0.97	21	
						haulms	1.17	0.12	1.29	36	
						straw	1.40	0.34	1.74	42	
						straw	1.73	0.44	2.17	49	
D - 24625 Großharrie (D05/02/98)	0.233	300	0.078	2	69 - 71	pl. w/o roots	8.23	0.07	8.30	0	# 1999/11509 421/0
						haulms	0.68	0.08	0.76	21	
						haulms	1.00	0.10	1.10	36	
						straw	1.95	0.38	2.33	42	
						straw	1.57	0.36	1.93	49	
NL - 5853 Siebengewal (AGR/04/98	0.250	300	0.083	2	69	pl. w/o roots	4.27	0.06	4.33	0	# 1999/11509 421/0
						haulms	0.84	0.09	0.93	20	
						straw	1.96	0.24	2.20	35	
						straw	2.24	0.59	2.83	44	
						straw	1.03	0.24	1.27	51	
NL - 5853 Siebengewal (AGR/04/98)	0.233	300	0.078	2	69	pl. w/o roots	4.04	0.07	4.11	0	# 1999/11509 EU/FR/01/98 421/0
						haulms	0.98	0.09	1.07	20	
						straw	1.65	0.21	1.86	35	
						straw	2.18	0.25	2.43	44	
						straw	0.81	0.20	1.01	51	
GB -AB30 1XJ Maykirk (OAT/01/98)	0.250	300	0.083	2	69 - 72	pl. w/o roots	3.32	0.06	3.38	0	# 1999/11509 421/0
						haulms	0.79	0.09	0.88	20	
						straw	1.19	0.26	1.45	33	
						straw	1.89	0.76	2.65	47	
GB - TQ7 2BU Kinesbridge (OAT/08/99)	0.250	300	0.083	2	69	pl. w/o roots	3.54	0.06	3.60	0	# 1999/11824 421/0
						haulms	1.30	0.21	1.51	20	
						straw	2.34	0.46	2.80	36	
						straw	2.33	0.61	2.94	43	
GB - NN13 6DY Brackley (OAT/09/99)	0.250	300	0.083	2	65	pl. w/o roots	2.67	0.03	2.70	0	# 1999/11824 421/0
						haulms	1.00	0.16	1.16	22	
						straw	1.31	0.26	1.57	36	
						straw	1.59	0.30	1.89	42	
GB -AB30 1XJ Maykirk (OAT/01/98)	0.233	300	0.078	2	69 - 72	pl. w/o roots	3.10	0.04	3.14	0	# 1999/11509 EU/FR/01/98 421/0
						haulms	1.12	0.15	1.27	20	
						straw	1.90	0.87	2.77	33	
						straw	2.23	0.85	3.08	47	

Location	Appl. per treatment					Residues					trials number method
	kg ai/ha	Water l/ha	Kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	mg/kg parent	mg/kg 500M 07	total	PHI days	
DK - 5500 Middelfart (ALB/01/99)	0.250	300	0.083	2	65 - 69	pl. w/o roots haulms straw straw	4.98 0.99 0.59 0.87	0.13 0.20 0.13 0.28	5.11 1.19 0.72 1.15	0 21 35 42	# 1999/11824 421/0
S - 23791 Bjärred Borgeby Gard (HUS/04/98)	0.250	300	0.083	2	69	pl. w/o roots haulms straw straw	5.21 0.50 1.81 2.50	0.13 0.18 0.52 1.20	5.34 0.68 2.33 3.70	0 22 36 42	# 1999/11825 421/0
USA NC/2	0.224	190		2	16/4/98	Hay Straw	0.72 0.23	0.13 0.09	0.85 0.32	14 53	1999: 5096 D9808
USA MO/04	0.224	67		2	1/5/98	Hay Straw	0.75 0.56	0.15 0.23	0.90 0.79	14 40	1999: 5096 D9808
USA OK/6	0.224	194		2	22/4/98	Hay straw	1.80 0.90	0.72 0.50	2.52 1.40	14 41	1999: 5096 D9808
USA OK/8	0.224	196		2	22/4/98	Hay straw	2.26 0.74	0.75 0.48	3.01 1.22	14 43	1999: 5096 D9808
USA TX/8	0.224	264		2	5/5/98	Hay Straw	1.60 1.55	0.73 0.82	2.33 2.37	14 43	1999: 5096 D9808
USA TX/8	0.224	264		2	5/5/98	Hay Straw	1.02 1.11	0.40 0.60	1.42 1.71	14 44	1999: 5096 D9808
USA TX/8	0.224	186		2	22/4/98	Hay straw	2.24 1.56	0.93 0.91	3.17 2.47	14 51	1999: 5096 D9808
USA TX/8	0.224	190		2	29/4/98	Hay Straw	3.07 3.84	1.23 1.57	4.30 5.41	14 41	1999: 5096 D9808
USA KS/8	0.224	94		2	12/5/98	Hay Straw Straw	1.48 1.23 1.40 1.47 1.91 2.20 2.05 1.31	0.58 0.52 0.58 0.59 0.81 0.95 0.90 0.72	2.06 1.75 1.98 2.06 2.72 3.15 2.95 2.02	14 19 29 34 40 47 54 61	1999: 5096 D9808
USA NE/7	0.224	190		2	19/5/98	Hay straw	0.46 0.06	0.07 0.02	0.53 0.08	14 45	1999: 5096 D9808
USA MN/5	0.224	196		2	15/6/98	Hay Straw	0.89 0.13	0.11 0.02	1.0 0.15	14 42	1999: 5096 D9808
USA MN/5	0.224	150		2	12/6/98	Hay Straw	0.91 0.20	0.22 0.08	1.13 0.28	14 41	1999: 5096 D9808
USA MN/5	0.224	150		2	21/6/98	Hay straw	0.54 0.52 0.37 0.10 0.15 0.11	0.15 0.16 0.12 0.04 0.09 0.07	0.69 0.68 0.49 0.14 0.24 0.18	14 19 29 40 54 68	1999: 5096 D9808
USA ND/5	0.224	95		2	11/7/98	Hay Straw	4.55 4.10	0.92 0.89	5.47 4.99	14 41	1999: 5096 D9808
USA ND/7	0.224	95		2	8/7/98	Hay Straw	2.03 0.85	0.54 0.31	2.57 1.16	14 43	1999: 5096 D9808
USA ND/5	0.224	190		2	22/6/98	Hay straw	0.43 0.09	0.09 0.02	0.52 0.11	15 49	1999: 5096 D9808
USA ND/7	0.224	140		2	25/6/98	Hay Straw	0.24 0.10	0.10 0.05	0.34 0.15	19 47	1999: 5096 D9808
USA ND/7	0.224	140		2	21/6/98	Hay Straw	0.83 0.21	0.17 0.07	1.00 0.28	14 50	1999: 5096 D9808
USA ND/7	0.224	140		2	22/6/98	Hay Straw	1.05 0.13	0.23 0.03	1.28 0.16	14 4	1999: 5096 D9808
USA SD/7	0.224	94		2	26/6/98	Hay straw	0.27 0.07	0.06 0.02	0.33 0.09	14 41	1999: 5096 D9808
USA SD/7	0.224	94		2	26/6/98	Hay Straw	0.21 0.03	0.02 <0.02	0.23 0.05	14 47	1999: 5096 D9808
USA ID/11	0.224	200		2	27/6/98	Hay Straw	0.49 0.12	0.11 0.06	0.60 0.18	14 46	1999: 5096 D9808
CANADA Alberta	0.224	340		2	6/7/98	Hay straw	1.46 1.55	0.32 0.36	1.78 1.91	14 49	1999: 5096 98032
CANADA Alberta	0.224	95		2	22/6/98	Hay Straw	1.02 0.11	0.38 0.07	1.40 0.18	53 53	1999: 5096 98032
CANADA Alberta	0.224	95		2	22/6/98	Hay Straw	0.93 0.10	0.36 0.08	1.29 0.18	57 57	1999: 5096 98032

Location	Appl. per treatment					Residues					trials number method
	kg ai/ha	Water l/ha	Kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	mg/kg parent	mg/kg 500M 07	total	PHI days	
CANADA Alberta	0.224	125		2	19/6/98	Hay straw	1.76 0.34	1.00 0.23	2.76 0.57	50 50	1999: 5096 98032
CANADA Saskatchevan	0.224	110		2	2/8/98	Hay Straw	2.17 0.24	1.35 0.19	3.52 0.43	51 51	1999: 5096 98032
CANADA Alberta	0.224	125		2	19/6/98	Hay Straw	3.00 2.86 2.56 1.17 3.51 1.67 1.39	1.10 1.03 0.97 0.64 1.61 1.08 0.90	4.10 3.89 3.53 1.81 5.12 2.75 2.24	14 19 24 40 47 54 68	1999: 5096 98032
CANADA Saskatchewa n	0.224	150		2	13/7/98	Hay straw	1.24 0.95	0.38 0.44	1.62 1.39	46 46	1999: 5096 98032
CANADA Saskatchewa n	0.224	160		2	14/7/98	Hay Straw	1.87 1.69	0.67 0.81	2.54 2.50	45 45	1999: 5096 98032
CANADA Manitoba	0.224	200		2	8/7/98	Hay Straw	0.95 0.37	0.24 0.11	1.19 0.48	40 40	1999: 5096 98032
CANADA Manitoba	0.224	200		2	17/7/98	Hay Straw	1.38 0.52	0.76 0.35	2.14 0.87	40 40	1999: 5096 98032
CANADA Manitoba	0.224	110		2	23/7/98	Hay straw	1.38 0.32	0.36 0.14	1.74 0.46	47 47	1999: 5096 98032

Table 85. Pyraclostrobin residues in barley straw and plants from supervised trials in the USA and Europe.

Location	Appl. per treatment					residues					Trials number method
	Kg ai/ha	Water l/ha	kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	mg/kg parent	mg/kg 500M 07	total	PHI days	
B - 3470 Kortenaken (AGR/05/98)	0.250	300	0.083	2	61	pl. w/o roots haulms straw straw	5.68 0.88 1.85 1.81	0.12 0.10 0.39 0.42	5.80 0.98 2.24 2.23	0 20 34 40	# 1999/11509 421/0
B - 3470 Kortenaken (AGR/05/98)	0.233	300	0.078	2	61	pl. w/o roots haulms straw straw	4.80 0.73 2.04 1.44	0.13 0.08 0.42 0.27	4.93 0.81 2.46 1.71	0 20 34 40	# 1999/11509 421/0
D - 67149 Meckenheim (DU2/05/98)	0.250	300	0.083	2	59	pl. w/o roots haulms straw straw	6.44 1.50 2.59 0.68	0.25 0.18 0.43 0.18	6.69 1.68 3.02 0.86	0 20 35 41	# 1999/11509 421/0
D - 67149 Meckenheim (DU2/08/98)	0.250	300	0.083	2	59	pl. w/o roots haulms straw straw	4.88 2.54 4.38 2.58	0.19 0.20 0.39 0.50	5.07 2.74 4.77 3.08	0 22 35 41	# 1999/11825 421/0
D - 24625 Großharrie (D05/03/99)	0.250	300	0.083	2	61	pl. w/o roots haulms haulms straw	6.03 1.73 1.36 2.77	0.16 0.34 0.24 0.63	6.19 2.07 1.60 3.40	0 20 34 42	# 1999/11824 421/0
D - 67149 Meckenheim (DU2/05/98)	0.233	300	0.078	2	59	pl. w/o roots haulms straw straw	6.01 1.39 2.55 1.48	0.26 0.14 0.36 0.25	6.27 1.53 2.91 1.73	0 20 35 41	# 1999/11509 421/0
S - 23791 Bjärred Borgeby Gard (HUS/03/98)	0.250	300	0.083	2	59	pl. w/o roots haulms haulms straw	5.99 0.46 0.53 0.78	0.14 0.07 0.09 0.16	6.13 0.53 0.62 0.94	0 22 35 42	# 1999/11509 421/0

Location	Appl. per treatment					residues					Trials number method
	Kg ai/ha	Water l/ha	kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	mg/kg parent	mg/kg 500M 07	total	PHI days	
S - 23791 Bjärred Borgeby Gard (HUS/02/99)	0.250	300	0.083	2	69	pl. w/o roots	6.43	0.15	6.58	0	# 1999/11824 421/0
						haulms	4.09	0.58	4.67	21	
						straw	5.68	1.58	7.26	35	
						straw	3.72	1.36	5.08	43	
S - 23791 Bjärred Borgeby Gard (HUS/05/98)	0.250	300	0.083	2	59	pl. w/o roots	4.46	0.14	4.60	0	# 1999/11825 421/0
						haulms	0.35	0.07	0.42	22	
						haulms	0.54	0.12	0.66	36	
						straw	0.78	0.23	1.01	42	
S - 22251 Lund	0.250	300	0.083	2	59	pl. w/o roots	8.03	0.08	8.11	0	2001/1009068 445/0
						haulms	0.37	0.08	0.45	28	
						haulms	0.41	0.09	0.50	35	
						haulms	0.25	0.08	0.33	42	
						straw	0.48	0.16	0.64	49	
S - 23791 Bjärred Borgeby Gard (HUS/03/98)	0.233	300	0.078	2	59	pl. w/o roots	6.22	0.16	6.38	0	# 1999/11509 421/0
						haulms	0.36	0.06	0.42	22	
						haulms	0.58	0.10	0.68	35	
						straw	0.99	0.23	1.22	42	
F - 62580 Neuville Saint Vaast (south) (FR2/05/99)	0.250	300	0.083	2	69	pl. w/o roots	6.46	0.14	6.60	0	# 1999/11824 421/0
						haulms	0.98	0.13	1.11	21	
						straw	1.72	0.31	2.03	35	
						straw	0.64	0.10	0.74	43	
F - 31870 Lagardere sur Leze Midi- South (A 1050)	0.250	300	0.083	2	59	pl. w/o roots	7.68	0.40	8.08	0	2002/1004077 445/0
						shoots	2.02	0.34	2.37	22	
						shoots	3.22	0.57	3.79	29	
						straw	2.23	0.62	2.85	36	
						straw	2.84	0.94	3.79	43	
F - 47120 Duras Aquitaine (A 1050 DR)	0.250	300	0.083	2	59	pl. w/o roots	5.47	0.58	6.05	0	2002/1004077 445/0
						shoots w/o	7.64	1.63	9.26	21	
						straw	6.59	1.83	8.43	27	
						straw	3.86	1.96	5.82	36	
						straw	5.80	2.59	8.39	42	
F - 51500 Taissy (BSF/623-5)	0.250	300	0.083	2	59	pl. w/o roots	5.55	0.04	5.59	0	2001/1009068 445/0
						haulms	6.56	1.11	7.67	27	
						straw	4.77	1.04	5.81	34	
						straw	4.83	1.16	5.99	42	
F - 26750 Saint Paul les Romans Rhone Alpes (A 1050 BD)	0.250	300	0.083	2	59	pl. w/o roots	6.40	0.43	6.72	0	2002/1004077 445/0
						shoots w/o r.	1.43	0.27	1.70	20	
						shoots w/o r.	0.93	0.24	1.17	27	
						shoots w/o r.	0.67	0.21	0.88	35	
						straw	1.69	0.54	2.23	42	
						straw	<0.02	<0.02	<0.04	63	
F - 40700 Sainte Colombe Aquitaine (A 1050 SA)	0.250	300	0.083	2	59	pl. w/o roots	3.23	<0.02	3.25	0	2002/1004077 445/0
						shoots w/o r.	0.53	0.06	0.59	20	
						shoots w/o r.	0.87	0.09	0.96	28	
						straw	0.59	0.04	0.63	35	
						straw	0.66	0.10	0.76	42	
F - 47120 Duras Aquitaine (A 1050 DR)	0.250	300	0.083	2	59	pl. w/o roots	7.75	0.30	8.05	0	2002/1004077 445/0
						shoots w/o r.	1.29	0.49	1.78	21	
						shoots w/o r.	1.23	0.42	1.65	28	
						straw	0.08	0.05	0.13	28	
						straw	1.03	0.66	1.68	42	
GB -CV9 2JS Bentley. Atherstone (OAT/03/98)	0.250	300	0.083	2	65	pl. w/o roots	3.35	0.12	3.47	0	# 1999/11509 421/0
						haulms	1.18	0.13	1.31	21	
						straw	4.42	0.52	4.94	35	
						straw	3.83	0.65	4.48	42	

Location	Appl. per treatment					residues					Trials number method
	Kg ai/ha	Water l/ha	kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	mg/kg parent	mg/kg 500M 07	total	PHI days	
GB -NN13 6DY Hillfarm. Halse Nr. Brackley (OAT/02/98)	0.250	300	0.083	2	59	pl. w/o roots	6.89	0.20	7.09	0	# 1999/11509 421/0
						haulms	1.81	0.52	2.33	22	
						straw	2.15	0.79	2.94	35	
						straw	2.82	1.07	3.89	42	
GB -CV9 2JS Atherstone (OAT/10/99)	0.250	300	0.083	2	65	pl. w/o roots	4.40	0.07	4.47	0	# 1999/11824 421/0
						haulms	0.74	0.09	0.83	20	
						straw	0.82	0.12	0.94	35	
						straw	0.84	0.17	1.01	42	
GB - LN9 6PX Salmonby (BSF/623-3)	0.250	300	0.083	2	61	pl. w/o roots	7.17	0.19	7.36	0	2001/1009068 445/0
						haulms	0.72	0.18	0.90	28	
						haulms	0.57	0.15	0.72	35	
						haulms	0.45	0.07	0.52	42	
						haulms	0.42	0.10	0.52	49	
						straw	0.72	0.20	0.92	56	
						straw	0.58	0.21	0.79	64	
E - 41799 Trajano (ALO/03/99)	0.250	300	0.083	2	63 - 65	pl. w/o roots	9.65	0.51	10.16	0	# 1999/11824 421/0
						haulms	1.65	0.27	1.92	21	
						haulms	1.34	0.27	1.61	34	
						straw	3.91	0.68	4.59	41	
E - 21880 Paterna (ALO/04/99)	0.250	300	0.083	2	61 - 63	pl. w/o roots	11.50	0.75	12.25	0	# 1999/11824 421/0
						haulms	4.32	1.51	5.83	21	
						straw	6.09	2.06	8.15	35	
						straw	6.92	1.81	8.73	43	
E - 21880 Paterna (ALO/05/99)	0.250	300	0.083	2	59 - 61	pl. w/o roots	14.60	1.06	15.66	0	# 1999/11824 421/0
						haulms	3.35	1.29	4.64	21	
						straw	4.87	1.74	6.61	35	
USA A/1 Germansville	0.224	305		2	13/6/98	Hay Straw	17 0.82	2.96 0.16	19.96 1.02	9 47	1999: 5079 D9808
USA MN/5 Theilman	0.224	190		2	15/6/98	Hay Straw	19.06 0.12	2.39 <0.02	21.45 0.14	14 42	1999: 5079 D9808
USA MN/5 Hollandale	0.224	150		2	15/6/98	Hay Straw	12.2 0.45	1.82 0.10	14.02 0.55	14 43	1999: 5079 D9808
USA MN/5 Campbell	0.224	140		2	21/6/98	Hay Straw	11.49 8.11 6.18 0.86 1.48 0.97	2.04 1.31 1.01 0.13 0.27 0.20	13.53 9.42 7.19 0.99 1.75 1.17	14 19 29 40 47 61	1999: 5079 D9808
USA SD/7 Barnad	0.224	95		2	22/6/98	Hay Straw	2.54 0.52	0.43 0.13	2.97 0.65	14 45	1999: 5079 D9808
USA ND/7 Jameston	0.224	95		2	1/7/98	Hay Straw	1.18 1.13	0.19 0.27	1.37 1.40	14 43	1999: 5079 D9808
USA ND/7 New Rocford	0.224	140		2	25/6/98	Hay Straw	1.00 0.12	0.22 0.02	1.22 0.14	14 43	1999: 5079 D9808
USA ND/7 Velva	0.224	140		2	21/6/98	Hay Straw	1.13 0.26	0.17 0.04	1.30 0.30	14 45	1999: 5079 D9808
USA CO/9 Delta	0.224	185		2	8/7/98	Hay Straw	1.52 0.32	0.27 0.08	1.79 0.40	14 63	1999: 5079 D9808
USA CA/10 Porterville	0.224	290		2	21/6/98	Hay Straw	1.60 2.41	0.39 0.71	1.99 3.12	14 43	1999: 5079 D9808
USA ID/11 Jerome	0.224	190		2	20/6/98	Hay Straw	1.04 0.32	0.22 0.08	1.26 0.40	13 53	1999: 5079 D9808
USA WA/11 Ephrata	0.224	190		2	8/6/98	Hay Straw	1.56 0.09	0.36 0.03	1.92 0.12	14 52	1999: 5079 D9808
USA QB/5B St Cesaire	0.224	275		2	16/6/98	Hay Straw	1.59 0.31	0.17 0.05	1.76 0.36	14 42	1999: 5079 D9808
CANADA alberta	0.224	100		2	8/7/98	Hay Straw	1.30 1.47	0.30 0.52	1.60 1.99	16 55	1999: 5096 98032
CANADA alberta	0.224	100		2	28/7/98	Hay Straw	0.93 0.87	0.24 0.27	1.17 1.14	14 41	1999: 5096 98032

Location	Appl. per treatment					residues					Trials number method
	Kg ai/ha	Water l/ha	kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	mg/kg parent	mg/kg 500M 07	total	PHI days	
CANADA alberta	0.224	200		2	9/7/98	Hay Straw	3.70 1.93	0.61 0.53	4.31 2.46	14 40	1999: 5096 98032
CANADA alberta	0.224	120		2	29/6/98	Hay Straw	3.61 1.26	1.30 0.58	4.91 1.84	14 40	1999: 5096 98032
CANADA alberta	0.224	120		2	25/6/98	Hay Straw	3.24 2.79	0.88 1.00	4.12 3.79	14 41	1999: 5096 98032
CANADA Saskatchevan	0.224	110		2	26/6/98	Hay Straw	2.15 0.83 1.01 1.38 1.41 1.09	0.20 0.12 0.15 0.31 0.37 0.30	2.35 0.95 1.16 1.69 1.78 1.39	14 23 32 42 49 63	1999: 5096 98032
CANADA Saskatchevan	0.224	110		2	7/8/98	Hay Straw	2.79 3.95	0.62 1.06	3.41 5.01	16 70	1999: 5079 D9802
CANADA Saskatchevan	0.224	150		2	13/7/98	Hay Straw	2.20 0.30	0.22 0.05	2.42 0.35	14 38	1999: 5079 D9808
CANADA Manitoba	0.224	110		2	1/8/98	Hay Straw	3.15 0.57	0.24 0.14	0.39 0.71	14 43	1999: 5079 D9808
CANADA Manitoba	0.224	110		2	14/7/98	Hay Straw	0.96 0.29	0.11 0.03	1.07 0.32	14 50	1999: 5079 D9808
CANADA Manitoba	0.224	200		2	8/7/98	Hay Straw	1.87 0.30	0.76 0.25	2.63 0.55	12 44	1999: 5079 D9808
CANADA manitoba	0.224	200		2	16/7/98	Hay Straw	2.10 0.39	1.02 0.45	3.12 0.84	12 43	1999: 5079 D9808

Table 86. Pyraclostrobin residues in rye straw from supervised trials in the USA.

Location	Appl. per treatment					Residues					Trials number method
	Kg ai/ha	Water l/ha	kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	mg/kg parent	mg/kg 500M 07	total	PHI days	
VA/2	0.224			2		Straw	0.14	0.03	0.17	66	1999: 5107 9808
SD/5	0.224			2		Straw	0.30	0.09	0.39	58	1999: 5107 D9808
KS/5	0.224			2		Straw	0.11	0.06	0.17	55	1999: 5107 D9808
ND/7	0.224			2		Straw	0.27	0.11	0.38	59	1999: 5079 D9808
ND/7	0.224			2		Straw	0.17	0.09	0.26	59	1999: 5079 D9808

Table 87. Pyraclostrobin residues in almond hulls resulting from supervised trials in the USA.

Location	Appl. per treatment					Residues					Trials number method
	Kg ai/ha	Water l/ha	kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	mg/kg parent	mg/kg 500M07	total	PHI days	
California Terra Bella. Tulare Co..	0.134	804	0.017	4	Mature	hulls	≤ 0.02	< 0.02	< 0.04	148	# 1999/5161 421/0 (g)
	0.134	2034	0.007	4	Mature	hulls	≤ 0.02	< 0.02	< 0.04	148	
Bakersfield Kern Co, ., California	0.134	728	0.018	4	Fruit set	hulls	0.47	0,09	0,56	108	# 1999/5161 421/0 (g)
	0.134	1890	0.007	4	Fruit set	hulls	0.55	0,10	0,65	108	
Fresno California	0.134	927	0.014	4	Small nuts	hulls	0.16	0,04	0,20	116	# 1999/5161 421/0 (g)
	0.134	2365	0.006	4	Small nuts	hulls	0.19	0,06	0,25	116	
Madera California	0.134	946	0.014	4	Small nuts	hulls	0.11	0,02	0,13	115	# 1999/5161 421/0 (g)
	0.134	2365	0.006	4		hulls	0.21	0,03	0,24	115	

Location	Appl. per treatment					Residues					Trials number method
	Kg ai/ha	Water l/ha	kg as/hl	No of tr.	Growth stage at last tr.	Portion analysed	mg/kg parent	mg/kg 500M07	total	PHI days	
Chico Butte Co., California	0.134	662	0.020	4	Appr. 5 weeks after petal fall	hulls	0.33	0,08	0,41	120	# 1999/5161 421/0 (g)
						hulls	0.58	0,11	0,70	127	
						hulls	0.61	0,12	0,73	134	
						hulls	0.87	0,15	1,02	141	
						hulls	0.46	0,11	0,57	148	
	0.134	1514	0.009	4	Appr. 5 weeks after petal fall	hulls	0.55	0.12	0.67	120	# 1999/5161 421/0 (g)
						hulls	0.88	0.18	1.04	127	
						hulls	0.86	0.16	1.03	134	
						hulls	1.34	0.25	1.59	141	
						hulls	1.06	0.22	1.27	148	

FATE OF RESIDUES IN STORAGE AND PROCESSING

In processing

Effects of hearing

Aqueous buffer solutions of pyraclostrobin with both labels were heated to simulate processing operations.

Table 88. Recovery after simulated processing (Scharf J. 1998b).

Process	Test conditions	Chlorophenyl label % of TAR	Tolyl label % of TAR
Pasteurisation	pH 4, 90 °C	98.1	103.9
Baking, brewing and boiling	pH 5, 100 °C	110.9	98.1
Sterilisation	pH 6, 120 °C	97.4	96.1

* Total applied radioactivity

HPLC analysis showed that pyraclostrobin remained unchanged during all the different tests.

Processing study on grapes

Immediately after the last application, residues of the parent compound were found in the range of 0.43 to 0.96 mg/kg. After 35 days these residues decreased to 0.36 to 0.78 mg/kg (Meumann H. *et al.*, 1999c) according to German GAP. With the exception of one sample, no pyraclostrobin or 500M07 residues were detected above the limit of quantification (0.02 mg/kg) in any must or wine samples (Table 89).

The results of procedural recovery experiments with each analytical set ranged from 71% to 107% (average 93%) for pyraclostrobin and 63% to 104% (average 90%) for 500M07; the fortification levels were 0.02 and 1.0 mg/kg.

Table 89. Pyraclostrobin residues in grapes and processed products from supervised trials.

Location	rate	water	Conc%	Nb treat	Stage	Commodity	Parent mg/kg	500M07 mg/kg	Total, mg/kg		
D – 69168 Wiesloch DU2/02/98	0.060 to 0.160	300 to 800	0.020	8 01/09/ 98	83	Grapes	0.96	0.09	1.05	0	# 1999/10982 421/0
						Grapes	0.74	0.07	0.81	35	
						Cold must	<0.02	<0.02	<0.04	35	
						Heated must	0.04	<0.02	0.06	35	
						Wet pomace	2.86	0.38	3.24	35	
						Wine with cold must	<0.02	<0.02	<0.04	35	
						Wine with heated must	<0.02	<0.02	<0.04	35	
D – 69168 Wiesloch DU2/03/98	0.060 to 0.160	300 to 800	0.020	8 08/09/ 98	81-83	Grapes	0.62	0.04	0.65	0	# 1999/10982 421/0
						Grapes	0.76	0.04	0.80	35	
						Cold must	<0.02	<0.02	<0.04	35	
						Heated must	<0.02	<0.02	<0.04	35	
						Wet pomace	2.81	0.31	3.12	35	

Location	rate	water	Conc%	Nb treat	Stage	Commodity	Parent mg/kg	500M07 mg/kg	Total, mg/kg		
						Wine with cold must	<0.02	<0.02	<0.04	35	
						Wine with heated must	<0.02	<0.02	<0.04	35	
D – 67269	0.060	300	0.020	8	81	Grapes	0.73	0.11	0.84	0	#
Grünstadt	to	to		18/08/		Grapes	0.78	0.14	0.93	35	1999/1098
DU3/02/98	0.160	800		98		Cold must	<0.02	<0.02	<0.04	35	2
						Heated must	<0.02	<0.02	<0.04	35	421/0
						Wet pomace	1.94	0.27	2.21	35	
						Wine with cold must	<0.02	<0.02	<0.04	35	
						Wine with heated must	<0.02	<0.02	<0.04	35	
D – 67269	0.060	300	0.020	8	81	Grapes	0.43	0.06	0.49	0	#
Grünstadt	to	to	0.020	18/08/		Grapes	0.36	0.04	0.39	35	1999/1098
DU3/03/98	0.160	800		98		Cold must	<0.02	<0.02	<0.04	35	2
(EU North)						Heated must	<0.02	<0.02	<0.04	35	421/0
						Wet pomace	2.00	0.19	2.18	35	
						Wine with cold must	<0.02	<0.02	<0.04	35	
						Wine with heated must	<0.02	<0.02	<0.04	35	

Table 90. Residues of pyraclostrobin and 500M07 in grape process fractions (wine).

Sample	Days after last application (DALA)	Total residue	Concentration factor
Whole grapes	0 35	0.49 – 1.05 0.39 – 0.93	1.0
Cold must	35	< 0.04	0
Heated must	35	< 0.04 – 0.06	0.12
Wet pomace	35	2.18 – 3.24	2.4 – 5.6
Wine from cold must	35	< 0.04	0
Wine from heated must	35	< 0.04	0

In a grape processing study (Wofford J.T. *et al*., 1999b) in California the total pyraclostrobin and 500M07 average residues in whole grapes, juice and raisins, were 3.11, 0.042 and 9.53 mg/kg, respectively (Table 91).

Table 91. Residues of pyraclostrobin and 500M07 in grape process fractions (juice and raisins).

Sample	**Total residue**	**Processing factor [1]**
Whole Grape	3.11	1.0
Grape Juice	0.042	0.013
Raisins	9.53	3.1

Processing studies on barley

In a study by Schulz and Scharm (2000 a,b) barley plants at a German test site were treated twice with 0.5 kg ai/ha The last application was 35 days before harvest, which is the pre-harvest-interval, at BBCH growth stage 59.

In a follow-up study (Schulz and Scharm, 2000b) barley plants were treated with the same application rate and timing in three trials at different German locations. The results are summarised in Table 92. There was no concentration of residues in products to be consumed.

Table 92. Residues of pyraclostrobin and 500M07 in process fractions of barley.

Study	Sample	Residues [mg/kg]						Total residues [mg/kg]		
		pyraclostrobin			500M07					
Basic study	Grain	0.03			0.04			0.07		
	Malt	0.04			0.05			0.09		
	Malt germ	0.07			0.03			0.10		
	Spent grain	0.30			0.25			0.55		
	Trub (flocs)	< 0.02			0.15			0.17		
	Beer yeast	< 0.02			0.08			0.10		
	Beer	< 0.02			< 0.02			< 0.04		
Follow-up	Grain	0.03	0.03	0.03	0.03	0.03	0.02	0.06	0.06	0.05
	Malt	0.03	0.04	0.03	0.04	0.04	0.03	0.07	0.08	0.06
	Beer	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.04	<0.04

Processing study on wheat

A wheat processing trial was conducted by Versoi *et al.* (1999) in the USA (Washington) to determine the distribution of pyraclostrobin residues in wheat processed fractions. The rates of application were respectively 112 g ai/ha x 4, 673 g ai/ha x 2 and 1120 g ai/ha x 2 . The second application was made at 50% head emergence but no less than 40 days before the expected grain harvest. The results are shown in Table 93.

Table 93. Residues of pyraclostrobin and 500M07 in wheat process fractions

Sample	Average residue [mg/kg][1]		Total residue [mg/kg]	Concentration factor [2]
	pyraclostrobin	500M07		
Grain	0.035	< 0.02	0.06	1.0
Flour	< 0.02	< 0.02	< 0.04	0.6
Bran	< 0.02	< 0.02	< 0.04	0.6
Middlings	< 0.02	< 0.02	< 0.04	0.6
Shorts	< 0.02	< 0.02	< 0.04	0.6
Germ	0.027	< 0.02	0.05	0.8

RESIDUES IN ANIMAL COMMODITIES

Cows. Fourteen lactating Friesian cows aged between 4 and 9 years and in the weight range 500 to 650 kg before treatment were used in the study (Schat and Beelen, 1999; Tilting, 2000a).

The cows were housed in a tie-stall with one empty stand between the treatment groups under usual husbandry conditions. The test substance at a nominal concentration of 14 mg as/g was dissolved in maize oil every week. The chemical stability and the homogeneity were assessed weekly using a sample of the solution from the first week. The maize oil solution (5.5 to 55 ml) was added to 2.0 or 3.0 kg of concentrate ration and fed to the animals individually twice daily during milking. A 55 ml aliquot of maize oil only was similarly added to the ration for control cows. All cows received grass silage and water ad libitum.

The dosing period was 28 days. Three cows in each test group were slaughtered one day after the final dose (zero withdrawal). Two cows of dose group 4 were maintained on the basal diet and were slaughtered on days 31 and 37 respectively, i.e. after two and seven days withdrawal.

Table 94. Calculation of the actual dose levels

Cow (BASF Number)	Nominal dose: mg/kg feed	Actual dose mg/animal/day	Actual concentration: mg/kg-bw	Actual concentration mg/kg-feed
Average group 1	0	0	0	0
Average group 2	7	134.5	0.22	8.8

Cow (BASF Number)	Nominal dose: mg/kg feed	Actual dose mg/animal/day	Actual concentration: mg/kg-bw	Actual concentration mg/kg-feed
Average group 3	21	403.2	0.67	27.2
Average group 4	70	1344.0	2.40	89.6

All cows were machine-milked twice daily into individual buckets and the milk yield recorded. Individual milk samples (4 x 50 g) were taken from each 24-hour milk production from day –3 to the end of the study. On day 26 additional five-litre samples were taken from the daily bulked milk production of each individual cow. Samples were separated by centrifugation into cream and skimmed milk.

All cows were slaughtered using a “shoot mask” followed by bleeding to death. A macroscopic post-mortem examination was carried out and samples of tissues taken.

Analysis of the samples was carried out by two methods. BASF method 439 was used to determine the amount of pyraclostrobin and the common moiety BASF method 446 was applied to determine residues including metabolites for risk assessment (worst-case estimate).

No residues in whole milk, skimmed milk or cream were detected in samples from the control group. No pyraclostrobin residues could be detected by method 439 in the samples, even from the tenfold dose level, except in cream where residues in the range of 0.02 mg/kg to 0.04 mg/kg occurred. With the common moiety method 446 only the cream samples showed residues above the limit of quantification in the 7 mg/kg dose group (average: 0.025 mg/kg). In the 21 mg/kg dose group (daily dose of 420 mg/animal), the situation was similar, but residues were higher (average in cream 0.037 mg/kg). Residues in milk were close to the limit of quantification of 0.02 mg/kg with a few samples above that limit.

In the exaggerated tenfold dose group residues in milk were up to 0.18 mg/kg, which mainly consisted of hydroxylated metabolites. As expected, the residue concentrations were higher in cream, but the concentration effect was only moderate. The average total residues in milk (day 27), skimmed milk and cream were 0.086 mg/kg, 0.068 mg/kg, and 0.195 mg/kg respectively.

Residues in tissues were determined by method 439 for the parent molecule and by LC-MS/MS method 446/1 for the total residue. No parent pyraclostrobin was detected in any tissue sample. With the common moiety method, residues could be detected in kidney and liver with the highest residues found in liver. In fat and muscle, no residues were detected at any dose level. In kidneys, residues were found only in the tenfold group, with average residues of 0.38 mg/kg. The highest residues were found in liverconsisting mainly of hydroxylated metabolites.

Table 95. Residue levels of pyraclostrobin and its metabolites in tissues (total method 446/1)

Treatment group	Group mean pyraclostrobin residue (mg/kg)			
	Muscle	Liver	Kidney	Fat
1 (Control)	< 0.1	< 0.1	< 0.1	< 0.1
2 (7 mg/kg 1 x)	< 0.1	0.20	< 0.1	< 0.1
3 21 mg/kg (3 x)	< 0.1	0.524	< 0.1	< 0.1
4 (70 mg/kg 10 x)	< 0.1	2.484	0.381	< 0.1
4 (2 days withdrawal)	< 0.1	1.476	0.107	< 0.1
4 (7 days withdrawal)	< 0.1	0.495	< 0.1	< 0.1

Table 96. Summary of residue levels of pyraclostrobin in tissues and milk (parent method 439).

mg/kg in the feed	milk	muscle	liver	kidney	Fat
Control	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05
2. 7 (8.8)	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05

mg/kg in the feed	milk	muscle	liver	kidney	Fat
3. 21 (27.2)	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05
4 70 (89.6)	<0.01	< 0.05	< 0.05	< 0.05	< 0.05

Poultry. No feeding study was conducted in poultry.

The metabolism study in laying hens was at dose levels of approximately 12 mg per kg feed. This again is a worst-case scenario, since total radioactive residues also include unextractable residues and metabolites not accounted for by the analytical method. Nevertheless the extrapolation shows that no residues above the LOQ of the residue analytical method (0.05 mg/kg) are to be expected.

Table 97. Potential transfer of residues to poultry tissues and eggs.

Sample	Total radioactive residue (mg/kg) from metabolism studies		Extrapolated total residue from actual intake (mg/kg)	
	Chlorophenyl label	Tolyl label	Based on chlorophenyl label	Based on tolyl label
Eggs	0.026	0.031	0.00065	0.00078
Muscle	0.007	0.009	0.00018	0.00023
Liver	0.317	0.474	0.0079	0.0118
Fat	0.083	0.065	0.0021	0.0021

RESIDUES IN FOOD IN COMMERCE OR AT CONSUMPTION

No information was available

NATIONAL MAXIMUM RESIDUES LIMITS

National MRLs.

Crop	MRL, mg/kg, in															
	AR	BR	CA	CH	CO	EE	EU	IT	LIT	MAC	PT	SJ	UK	US	YU	ZA
almond			0.04													
almond (hull)														1.60		
almond (peel)			1.60													
apple		1.50	0.50				0.50									
banana		0.50	0.04		0.04									0.04		
Barley		1.3	0.40	0.50		0.30	0.20							0.40		
barley (hay)			25											25		
barley (straw)			6.00											6.00		
bean.dry		0.10	0.50											0.30		
Broccoli							0.20									
Brussels sprout							0.30						0.30			
bulb vegetables			0.70				1.00							0.90		
Burdock			0.40													
Carrots		0.20	0.40				0.50									
Cauliflower							0.20									
Cereal									0.50							
Celeriac			0.40													
cherries (sweet-sour)							1.00									
Chervil			0.40													
chicory root			0.40													
Chilli			1.00													
Citrus			0.70				1.00							0.70		
citrus.dried pulp														5.50		

Crop	MRL, mg/kg, in															
	AR	BR	CA	CH	CO	EE	EU	IT	LIT	MAC	PT	SJ	UK	US	YU	ZA
citrus.oil														4.00		
Coffee		0.50														
corm vegetables			0.04											0.04		
Cucurbits			0.50				0.50							0.50		
Eggplant			1.00				1.00							0.50		
fruiting vegetables			1.00											1.40		
flowering brassicae													0.30			
Garlic			0.65											0.90		
Ginseng			0.40													
grain.aspirated fractions														2.50		
grape (juice)			2.00													
grape (raisins)			7.00											7.00		
Grapes		4.00	2.00	2.00			2.00			2.00		0.50		2.00	0.50	
grapes.table																
grasses (forage)			10											10		
grasses (hay)			4.50											4.50		
grasses (seed)			27											27		
grasses (straw)			14											14		
head cabbage							0.10						0.20			
Hops							3.00									
Horseradish			0.40													
Kale							1.00									
Leek			0.65				1.00							0.90		
Lentil			0.50				0.50							0.50		
Lettuce							0.50									
Maize		0.10														
melon		0.10	0.50													
Nuts			0.04				0.05							0.04		
Oat		1.00		0.10		0.30	0.20						0.20			
Onion			0.65											0.90		
orange														0.70		0.10
orange (juice)			0.70													
orange (oil)			4.00													
orange (pulp. wet)			6.30													
other crops							0.02									
papaya		0.10														
Parsley			0.40													
Parsnip			0.40													
pea (dried)			0.50				0.50							0.40		
pea (forage)			10													
pea (vine hay)			26													
Peaches							1.00									
Peanut	0.05	0.10	0.05				0.05							0.05		
peanut (oil)			0.10											0.10		
peanut (paste)			0.05													
Pear			0.50													
Peppers			1.00				1.00							0.50		
Pistachio			0.50				0.50							0.70		
plum (prune)			0.70													
Plums							1.00									
potato		0.10	0.04				0.05									
potato (chips)			0.04													
potato (flakes)			0.04													
potato (peel)			0.04													

Crop	MRL, mg/kg, in															
	AR	BR	CA	CH	CO	EE	EU	IT	LIT	MAC	PT	SJ	UK	US	YU	ZA
radish (leaves)			16											16		
radish .oriental			0.40													
root vegetables			0.40				0.50							0.40		
Rutabaga			0.40													
Rye			0.04				0.10							0.04		
rye (straw)			0.50											0.50		
salsify.black			0.40													
Skirret			0.40													
Shallot			0.65											0.90		
small fruits			1.00				1.00							1.30		
Soybean	0.05	0.10														
soybean oil	0.10															
Spelt							0.10									
stone fruits			0.70											0.90		
Strawberry			0.40				1.00						0.50	0.40		
sugar beet			0.15				0.20							0.20		
sugar beet (leaves)			8.00											8.00		
sugar beet (molasses)			0.20													
sugar beet (pulp. dried)			1.60											1.00		
sugar beet (root)			0.20											0.20		
sugar beet (sugar)			0.20													
Tea																
Tomatillo			1.00											0.50		
tomato (paste)			2.00													
tomato (sauce)			1.00													
Tomatoes		0.20	1.00				1.00							0.50		
Triticale							0.10									
tuberous vegetables			0.04											0.04		
Turnip			0.40													
Wheat	0.2	0.50	0.20				0.10		0.50				0.20	0.20		
wheat (bran)			0.04													
wheat (flour)			0.20													
wheat (hay)			6.00											6.00		
wheat (milling products)			0.04													
wheat (other cereal products)			0.50													
wheat (straw)			6.00											8.50		

APPRAISAL

Residue and analytical aspects of pyraclostrobin were considered for the first time by the present Meeting.

Pyraclostrobin, chemical name (IUPAC) methyl *N*-(2-{[1-(4-chlorophenyl)-1*H*-pyrazol-3-yl]-oxymethyl}phenyl)-*N*-methoxycarbamate, is a new fungicidal active ingredient. It represents a modification of the structural pattern of natural fungicides called strobilurins.

The Meeting received information on the metabolism and environmental fate of pyraclostrobin, methods of residue analysis, freezer storage stability, national registered use patterns, the results of supervised residue trials, farm animal feeding studies, fate of residues in processing and national MRLs.

Metabolism

Animals

The Meeting received the results of metabolism studies in rats, lactating goats and laying hens. The metabolism and distribution of pyraclostrobin in plants and livestock was investigated with [chlorophenyl-^{14}C]pyraclostrobin and [tolyl-^{14}C]pyraclostrobin

The main metabolite are methyl-*N*-(2{[1-(4-chlorophenyl)-1*H*-pyrazol-3-yl]oxymethyl}phenyl) carbamate (500M07) and 1-(4-chlorophenyl)-1*H*-pyrazol-3-yl hydrogen sulfate.

Metabolism in laboratory rats was evaluated by the WHO panel of the 2003 JMPR, which concluded that the metabolism proceeds through three main pathways. The methoxy group on the tolyl-methoxycarbamate moiety is readily lost, with few main metabolites retaining this group. Hydroxylation of the benzene or pyrazole ring is followed by conjugation with glucuronide. Many metabolites are derived from the chlorophenol pyrrazole or tolyl-methoxycarbamate moieties of pyraclostrobin. The metabolites were similar in both sexes and at all doses. No unchanged parent compound was found in bile or urine, and only small amounts were found in faeces.

Studies of the metabolism of pyraclostrobin in *goats* showed that residues in products of animal origin derive from the parent compound as well as from its *N*-desmethoxylation product. The metabolism and distribution of pyraclostrobin were investigated in lactating goats given material labelled in the chlorophenyl or in the tolyl ring. After five consecutive daily oral administrations of ^{14}C-pyraclostrobin at a nominal dosage of 12 or 50 mg/kg of feed, there was rapid absorption from the gastrointestinal tract. Radioactivity was excreted mainly via the faeces. The radiolabel in milk accounted for only 0.1–0.5% of the total applied radioactivity. There was no indication of accumulation of ^{14}C-pyraclostrobin in tissues. The parent compound was found in fat, muscle and, at lower amounts, in liver. Metabolites are formed in liver and kidney by hydroxylation of the chlorophenyl and tolyl rings and by cleavage of the molecule. Little extraction was seen in liver.

^{14}C-Pyraclostrobin is thus metabolized in goats by three key steps: (1) desmethoxylation at the oxime ether bond, (2) hydroxylation of the chlorophenyl, the pyrazole or the tolyl ring system and (3) cleavage of the two ring systems with subsequent oxidation of the two resulting molecules.

Pyraclostrobin was present in all tissues and in milk and was the main residue component in muscle and in fat (log P_{ow} = 3.99).

Tissues and eggs from *hens* that received an exaggerated dose of 12 mg/kg feed of [chlorophenyl-^{14}C]pyraclostrobin or 13 mg/kg [tolyl-^{14}C]pyraclostrobin contained low residue levels consisting of three main metabolites. The parent compound was found in fat and eggs but not in liver. The main metabolite in liver was the glucuronic acid conjugate, which was bound to the tolyl ring of the demethoxylated parent structure. The desmethoxy metabolite 500M07 was also present in fat and eggs,

Five routes of biotransformation were detected. The predominant transformation was the demethoxylation step. Second, the demethoxylated metabolite was oxygenated at the tolyl ring, followed by conjugation with glucuronic acid. Third, the demethoxylated metabolite was hydroxylated at the chlorophenyl or the pyrazole ring, again followed by a conjugation reaction with glucuronic acid. Fourth, the parent compound was hydroxylated at the chlorophenyl ring in the *para* position, whereby the C-l was shifted to the *meta* position (NIH shift). Fifth, the parent compound was cleaved at the methylene ether bridge. A specific variation was substitution of C-l by glucuronic acid.

The main metabolite in fat and eggs was 500M07, and that in liver was the glucuronic acid conjugate. The metabolism in rats, goats and hens were comparable.

Plants

The Meeting received the results of studies of the metabolism of pyraclostrobin in grapes, potatoes and wheat.

The metabolism of pyraclostrobin in *grapes* was investigated with material labelled in the tolyl or the chlorophenyl ring. Applications were made six times at a rate of 0.25 kg ai/ha, and the grapes were harvested

40 days after the last application. The relevant residue in grapes consists of the parent compound and its desmethoxy metabolite 500M07. Some other compounds were identified as products formed by cleavage of the molecule. *O*-Glucosylation and methoxylation were of minor importance, representing much less than 10% of the TRR.

Studies of metabolism in *potato* were conducted with material labelled in the tolyl or the chlorophenyl ring. Six post-emergence applications were made at the intended use rate of 300 g/ha. The relevant residue in potato green matter and tuber consisted of the parent compound (65% and 2.5% of the TRR, respectively) and its desmethoxy metabolite 500M07 (6.2% and 0.6% of the TRR, respectively) at growth stage 70.

Some other compounds were identified as products formed by cleavage of the molecule. *O*-Glucosylation and methoxylation were of minor importance, representing far less than 10% of the TRR. The total residue levels in the edible portion (potato tubers) were low. One derivative found in larger amounts in tubers was identified as the naturally occurring amino acid L-tryptophan. This compound represented 10% of the TRR in tuber at growth stage 70, but its contribution increased to 29.2% of the TRR at growth stage 85–89. It should not therefore be regarded as a relevant residue that must be covered by the analytical method.

Wheat received two application at 0.3 kg ai/ha, and samples were collected 0, 31 and 41 days after the last treatment. The relevant residue of ^{14}C-pyraclostrobin in wheat consists of unchanged parent compound and its desmethoxy metabolite 500M07. Tryptophan, which is formed in considerable amounts from pyraclostrobin in grain, is a natural ingredient and is therefore of no toxicological concern. All the other metabolites identified represented < 10% TRR and are thus of minor importance. The low levels of unextractable residues in forage and straw indicate that pyraclostrobin and its metabolites are not firmly associated with cell wall polymers. Somewhat larger amounts of unextractable were found in grain, as some of the radioactivity was incorporated into or associated with grain protein and starch.

The metabolic pathways in grapes, potatoes and wheat were qualitatively similar. Pyraclostrobin and its desmethoxy metabolite 500M07 constituted the main part of the residue. In addition, hydroxylation in the tolyl and the chlorophenyl rings and cleavage reactions between the two ring systems were observed. The hydroxylation reaction is followed by glucosylation or methylation, whereas the intermediates of the cleavage reaction are further transformed by conjugation or the shikimate pathway. Transformation via the shikimate pathway resulted in the formation of the natural amino acid L-tryptophan in potato tubers and wheat grain.

Environmental fate

Soil

The Meeting received the results of studies on the fate and behaviour in soil of [tolyl-U-^{14}C]pyraclostrobin and [chlorophenyl-U-^{14}C]pyraclostrobin.

Pyraclostrobin was investigated for aerobic metabolism in a number of soils. The degradation of pyraclostrobin in aerobic soil studies is characterized by a relatively low mineralization rate (about 5% of the total applied radioactivity within 100 days) and formation of large amounts of bound residues (about 55% of the total). The same metabolites, the *trans*-azooxy and the *trans*-azo dimers (or *N*,*N*´-bis-[2-(1*H*-pyrazol-3-yloxymethyl)phenyl]diazene) of pyraclostrobin, were found in all soil types. The amount of the *trans*-azooxy dimer generally exceeded 10% the total applied radioactivity (maximum, 31%), whereas that of the *trans*-azo dimer slightly exceeded 10% of the total applied in only one of the investigated soils. The amount of bound residue increased with time, and the most of the radiolabel was associated with insoluble humins and high-molecular-mass humic acids. No release of pyraclostrobin or its metabolites was observed, even with harsh extraction methods (NaOH) or with intensive activity of soil-eating animals (earthworms). Photolytic degradation leads to the same degradation products; however, all the metabolites were formed in amounts less than 10% of the total applied radioactivity.

Pyraclostrobin is degraded in soil under laboratory conditions, with DT_{50} values ranging from 12 to 101 days in five microbially active soils. Higher soil moisture contents generally accelerated the degradation. Photolysis did not significantly influence the degradation rate; however, it reduced the amounts of the *trans*-azooxy and the *trans*-azo dimers of pyraclostrobin. In field studies, the DT_{50} values of pyraclostrobin were much lower, ranging from 2 to 37 days. The DT_{90} values in the field were 83–230 days. The DT_{50} values of the soil metabolites in the laboratory were 60–166 days for the *trans*-azooxy dimer and 38–159 days for the *trans*-azo dimer. (The high values for the latter were calculated for soils in which the metabolite was formed in amounts < 10% total applied radioactivity.) Under field conditions, however, the metabolites 500M07 and *trans*-azo dimer were not detected. Only the *trans*-azooxy dimer was found sporadically in trace amounts close to the LOQ.

With regard to mobility, no radiolabel was found in leaching studies, and pyraclostrobin remained in the first layer of soil (< 12 cm). Thus, pyraclostrobin and its metabolites are not mobile in soil.

The results indicate that pyraclostrobin and its metabolites are not stable in soil. They were degraded quickly and were not mobile.

Succeeding crops

The residue levels and the nature of the residues of pyraclostrobin were investigated in three succeeding crops, radish, lettuce and wheat, after application at a rate of 900 g ai/ha. The total residues in the edible parts of the succeeding crops were low at all plant-back intervals. There was no accumulation of pyraclostrobin or its degradation products in the parts of plants used for human or animal consumption.

Methods of analysis

Methods for the determination of pyraclostrobin in plant and animal matrices are based on HPLC with ultraviolet, mass spectrometry or tandem mass spectrometry detection. The LOQ is 0.02 mg/kg in plant matrices, 0.01 mg/kg in milk and 0.05 mg/kg in others animal matrices.

Plant matrices are extracted with methanol:water and purified on a micro-C_{18} column with a micro silica gel column step. Independent laboratory validation showed good performance of the methods.

Animal matrices can be extracted with acetone or acetonitrile and purified by liquid–liquid partition. Further clean-up is necessary before determination.

For enforcement, HPLC with ultraviolet detection was used, but some difficulties were found for crops like hops and oilseed crops.

Stability of residues in stored analytical samples

The stability of pyraclostrobin in plant matrices was shown to be 19 months. Untreated samples were fortified with 1.0 mg/kg pyraclostrobin and its metabolite 500M07. The residues in peanut meat, peanut oil, wheat grain, wheat straw, sugar beet tops, sugar beet roots, tomatoes and grape juice were stable during storage (range, 88–106% for the parent and 84–120% for the metabolite 500 M07).

Untreated samples of muscle, liver and milk from a cow were fortified with pyraclostrobin at 0.5 mg/kg (0.1 mg/kg in milk) or a mixture of 0.5 mg/kg (0.1 mg/kg for milk) pyraclostrobin and the same amount of a hydroxylated metabolite. Other potential metabolites also form these analytes on cleavage of the methylene ether bridge. After about 0, 30, 60, 90, 120 and 240 days, samples were analysed by BASF methods Nos 439 and 446. The results used to calculate stability were corrected for individual procedural recoveries. The average results of analysis for the parent compound with method 446 show degradation in muscle and milk. The model hydroxylated metabolite appeared to be less stable after 240 days' storage (68–86% in liver, milk and muscle). Nevertheless, this result does not affect the validity of the cow feeding study, as milk samples, in which degradation of the metabolite was fastest, were analysed within 91 days of sampling.

Definition of the residue

Three studies were performed on metabolism in three crop categories: grape for fruits, potato for root and tuber vegetables and wheat for cereals. Pyraclostrobin (grapefruits, potato green matter, wheat forage, wheat straw) and the desmethoxy metabolite 500M07 (grape fruits, potato green matter, wheat forage, wheat straw) accounted for most of the residue in most plant samples investigated. As the desmethoxy metabolite occurred in much smaller amounts than parent pyraclostrobin, the metabolite was not included in the definition of the relevant residue.

Studies of metabolism in goats and hens showed that the residues in products of animal origin derive from the parent compound and from its *N*-desmethoxylation product. Oxidation of the aromatic rings to several hydroxylated compounds and cleavage of the molecule led to further metabolites. As these transformations occur in matrices with small amounts of parent or little extractability, residue data obtained by this method represent reasonable worst-case estimates for risk assessment in all matrices. Furthermore, a method for parent only was developed to monitor residues of pyraclostrobin.

The Meeting agreed that the parent compound is suitable for enforcement in plant and animal commodities and is also the compound of interest for dietary risk assessment.

Definition of the residue for compliance with MRL and for estimation of dietary intake: pyraclostrobin.

The residue is fat-soluble.

Results of supervised trials on crops

The Meeting received data from supervised trials on citrus, nuts, apple, stone fruit, grape, strawberry, raspberry, blueberry, banana, mango, papaya, carrot, radish, sugar beet, garlic, onion, tomato, red pepper, summer squash, cucumber, lettuce, bean, lentil, pea dry, peanut, soya bean, oat, wheat, barley, maize and coffee. Most of the trials were carried out in the USA. All of the information from Europe and the USA was acceptable. The trials were conducted according to GLP.

Citrus fruit
GAP trials were reported from the Republic of Korea (citrus), South Africa (grapefruit and orange) and the USA (grapefruit, lemon, lime, orange, tangelo and tangerine).

Orange

Trials were conducted in Argentina (one) at 0.075 kg ai/ha, with four applications, including a study on the decline of residues, and in the USA (13) at GAP (0.274 kg ai/ha, four applications, 14-day PHI). The residue levels in orange were: 0.12, 0.13, 0.17 (two), 0.18, 0.19, 0.23, <u>0.24</u>, 0.25, 0.26, 0.34, 0.35, 0.37 and 0.51 mg/kg. The Meeting estimated a maximum residue level of 1 mg/kg, an STMR of 0.24 mg/kg and a highest reside level of 0.51 mg/kg for orange.

No residue was detected in pulp in five trials (< 0.02 mg/kg).

Grapefruit

Six trials were carried out in the USA at GAP (0.27 kg ai/ha, four applications,14-day PHI). The pyraclostrobin residue levels were: 0.07, 0.08, 0.11, <u>0.12</u>, 0.19 and 0.24 mg/kg. The Meeting estimated a maximum residue level of 0.5 mg/kg, an STMR of 0.12 mg/kg and a highest reside level of 0.24 mg/kg for grapefruit.

The residue in pulp was below the LOQ in one trial.

Lemon

Trials were conducted in Argentina (two trials at 0.075 kg ai/ha, four applications with two decay curves), Brazil (four trials with one decay curve) and the USA (five trials at GAP: 0.27 kg ai/ha, four applications, 14-day PHI). The trials in Brazil could not be evaluated (no GAP), and no results were available from the trial in Argentina at 14 days.

Pyraclostrobin residue levels in lemons in the five US trials were 0.15, 0.19, 0.20, 0.28 and 0.32 mg/kg. The Meeting estimated a maximum residue level of 0.5 mg/kg, an STMR of 0.20 mg/kg and a highest reside level of 0.32 mg/kg for lemon.

The Meeting agreed to combine the above results in order to estimate a maximum residue level for citrus fruit. The combined results from the trials in Argentina and the USA, in ranked order, were: 0.07, 0.08, 0.11, 0.12 (two), 0.13, 0.15, 0.17 (two), 0.18, 0.19 (three), 0.20, 0.23, 0.24 (two), 0.25, 0.26, 0.28, 0.32, 0.34, 0.35, 0.37 and 0.51 mg/kg.

The Meeting estimated a maximum residue level of 1 mg/kg, with an STMR of 0.19 mg/kg and a highest reside level of 0.51 mg/kg for citrus.

Apple

GAP in Brazil was reported to be a rate of 0.1 kg ai/ha, with four applications and a 14-day PHI. Eight trials were conducted in Brazil at 0.15 kg ai/ha with two decay curves and six trials at 0.3 kg ai/ha. The Meeting agreed that no maximum residue level for apple could be established.

Stone fruit

GAP was reported from Canada (stone fruit) and the USA (peach, nectarine, apricot, plum, prune and cherry). The rate of application in the two countries is the same, 0.13 kg ai/ha with five applications. The waiting period is 10 days in Canada and 0 day in the USA.

Peach

Eighteen trials were carried out in the USA according to GAP. Two trials with decay curves were available. Pyraclostrobin residue levels in peaches were 0.07, 0.08 (two), 0.10 (two), 0.11, 0.13, 0.14, 0.15 (two), 0.16 (two), 0.20, 0.21, 0.23, 0.26, 0.28 and 0.31 mg/kg. The Meeting estimated a maximum residue level of 0.5 mg/kg, an STMR of 0.15 mg/kg and a highest reside level of 0.31 mg/kg for peaches.

Cherry

Twelve trials on sour cherries were conducted in the USA according to GAP. Pyraclostrobin residue levels were 0.25 (two), 0.27, 0.34, 0.38, 0.42, 0.43, 0.48, 0.50 (two), 0.51 and 0.63 mg/kg. The Meeting estimated a maximum residue level of 1 mg/kg, an STMR of 0.43 mg/kg and a highest reside level of 0.63 mg/kg for cherry.

Plum

Twelve trials were carried out in the USA according to GAP, including two with decay curves. Pyraclostrobin residue levels were 0.02 (two), 0.03, 0.04 (two), 0.05, 0.06 (three), 0.12, 0.13 and 0.19 mg/kg. The Meeting estimated a maximum residue level of 0.3 mg/kg, an STMR of 0.06 mg/kg and a highest reside level of 0.19 mg/kg for plums.

Berries and small fruit

Grape

A total of 48 trials were performed in representative growing areas in Brazil, Europe and the USA. GAP was 0.1 kg ai/ha with two applications and a 7-day PHI in Brazil (four trials), 0.16 kg ai/ha with eight and three applications and a 35-day PHI in Europe (30 trials) and 0.168 kg ai/ha with three applications and a 14-day PHI in the USA (14 trials).

The pyraclostrobin residue levels in grapes in trials conducted according to GAP in Brazil were 0.36, 0.79, 1.1 and 1.4. The levels in trials conducted according to GAP in Europe (France, Germany, Italy and Spain) were 0.13, 0.16, 0.17 (two), 0.20, 0.23, 0.25, 0.26, 0.36, 0.40, 0.44 (two), 0.47, 0.56, 0.59 (two), 0.64, 0.67, 0.74, 0.75, 0.76, 0.78 (two), 1.2 and 1.3 mg/kg. The levels in trials conducted according to GAP in the USA were 0.09, 0.10 (two), 0.12 (two), 0.22, 0.24, 0.35, 0.43, 0.49 (two), 0.55, 0.67 and 1.2 mg/kg.

The Meeting agreed to combine the results in order to estimate a maximum residue level for grapes. The levels, in ranked order, were: 0.09, 0.10 (two), 0.12 (two), 0.13, 0.16, 0.17 (two), 0.20, 0.22, 0.23, 0.24, 0.25, 0.26, 0.35, 0.36 (two), 0.40, 0.43, 0.44 (two), 0.47, 0.49 (two), 0.55, 0.56, 0.59 (two), 0.64, 0.67 (two), 0.74, 0.75, 0.76, 0.78 (two), 0.79, 1.1, 1.2 (two), 1.3 and 1.4. The Meeting estimated a maximum residue level of 2 mg/kg, an STMR of 0.44 mg/kg and a highest reside level of 1.4 mg/kg for grapes.

Strawberry

GAP was reported for Canada and the USA. Eight trials were carried out in the USA at GAP (0.2 kg ai/ha, five applications, 0-day PHI), one with a decay curve.

The levels of pyraclostrobin residues in strawberries in trials conducted according to GAP in the USA were: 0.06, 0.10, 0.13, 0.15, 0.16, 0.19, 0.24 and 0.26 mg/kg. The Meeting estimated a maximum residue level of 0.5 mg/kg, an STMR of 0.16 mg/kg and a highest reside level of 0.26 mg/kg for strawberry on the basis outdoor uses of pyraclostrobin.

Raspberry

GAP is reported for the USA only, with four applications at 0.2 kg ai/ha and 0-day PHI. The results of three trials were provided.

The Meeting agreed that no maximum residue level for raspberries could be established.

Blueberry

GAP was available in Canada and the USA. The rate of application (0.2 kg ai/ha) and the number of applications (four) were the same, but the PHI in the USA is 0 days. Six trials were performed in the USA, but one included 50% ripe fruit.

The levels of pyraclostrobin residues in blueberries in trials conducted according to GAP in the USA were, in ranked order: 0.19, 0.30, 0.33, 0.35, 0.48 and 0.57 mg/kg. The Meeting estimated a maximum residue level of 1 mg/kg, an STMR of 0.34 mg/kg and a highest reside level of 0.57 mg/kg for blueberry.

Assorted tropical fruit minus inedible peel

Banana

Twelve trials were conducted in the main banana-growing regions of Central and South America. In all the trials, the formulation BAS 500 00F was applied eight times at a rate of 0.1 kg ai/ha. According to regional agricultural practice, the bananas were treated both bagged and unbagged and collected separately. Samples of whole bananas with peel were taken directly after the last application. No levels > 0.02 mg/kg were found in any sample.

The levels of pyraclostrobin residues in bananas in trials conducted according to GAP in Colombia (two), Costa Rica (three), Ecuador (three), France, Guatemala and Mexico were < 0.02.mg/kg. The Meeting estimated a maximum residue level of 0.02* mg/kg, an STMR of 0.02 mg/kg and a highest reside level of 0.02 mg/kg for bananas.

Mango

GAP in Brazil requires a maximum rate of 0.1 kg ai/ha, with two applications and a 7-day PHI. Four trials were conducted in Brazil at a rate of 0.225 kg ai/ha with three applications, and three trials were conducted at a rate of 0.45 kg ai/ha. No residues were detected at 0 or 7 days (< 0.05 mg/kg).

The Meeting agreed to propose a maximum residue level of 0.05* mg/kg and STMR and highest reside values of 0.05 mg/kg.

Papaya

GAP in Brazil requires a maximum rate of 0.1 kg ai/ha, four applications and a 7-day PHI. Four trials were reported from Brazil at a rate of 0.125 kg ai/ha and three trials at 0.25 kg ai/ha. No residues were detected at 7 days (< 0.05 mg/kg)

The Meeting estimated a maximum residue level of 0.05* mg/kg and STMR and highest reside values of 0.05 mg/kg for papaya.

Bulb vegetables

GAP was reported for Brazil (onions), Canada (bulb vegetable) and the USA (garlic and onions). The maximum rate of application is 0.1 kg ai/ha in Brazil and 0.17 kg ai/ha in Canada and the USA. The PHI is 3 days for onions and 7 days for garlic in Brazil and 7 days in Canada and the USA.

Seven trials were conducted on garlic in Brazil, but only four in accordance with GAP, and seven trials were conducted on onions, none of which conformed to GAP. Nine trials on onions were conducted in the USA.

Garlic

In the four trials in Brazil conforming to GAP, all the residue levels were < 0.05 mg/kg.

The Meeting estimated a maximum residue level of 0.05* mg/kg and STMR and highest reside values of 0.05 mg/kg for garlic.

Onion

Four trials in Brazil conducted at a rate of 0.15 kg ai/ha and a PHI of 7 days and three trials at a rate of 0.30 kg ai/ha and 7-day PHI could not be used to evaluate the residue levels.

Bulb onion

In six trials carried out in the USA according to GAP, the levels of pyraclostrobin residues in dry onions were: <u>0.02</u> (five) and 0.09 mg/kg. The Meeting estimated a maximum residue level of 0.20 mg/kg, an STMR of 0.02 mg/kg and a highest reside level of 0.09 mg/kg for onions, dry.

Spring onion

In three trials conducted according to GAP in the USA, the levels of pyraclostrobin residues in spring onions were 0.05, 0.42 and 0.53 mg/kg.

The Meeting agreed that no maximum residue level for spring onions could be established

Fruiting vegetables

Tomato

GAP was reported for Brazil, Canada (fruiting vegetables), Chile and the USA. The critical GAP was a maximum rate of 0.224 kg ai/ha, six applications and a 0-day PHI. Three outdoor trials were conducted in Brazil and 21 in the USA, which included two with decay curves.

The levels of pyraclostrobin residues in tomatoes in trials conducted according to GAP in Brazil were, in ranked order: 0.02, 0.03 and 0.12 mg/kg. The levels in the trials in the USA were, in ranked order: 0.06, 0.07 (two), 0.08, 0.10, 0.11 (four), 0.12 (three), 0.13 (two), 0.15, 0.16, 0.17 (three), 019 and 0.21 mg/kg.

The Meeting combined the data from Brazil and the USA, giving levels, in ranked order, of: 0.02, 0.03, 0.06, 0.07 (two), 0.08, 0.10, 0.11 (four), <u>0.12</u> (four), 0.13 (two), 0.15, 0.16, 0.17 (three), 019 and 0.21 mg/kg.

The Meeting estimated a maximum residue level of 0.3 mg/kg, an STMR of 0.12 mg/kg and a highest reside level of 0.21 mg/kg for tomato.

Chili pepper

GAP was reported for Brazil (maximum rate of 0.1 kg ai/ha and 3-day PHI), Canada (fruiting vegetable), the Republic of Korea and the USA (maximum rate of 0.224 kg ai/ha, six applications and 0-day GAP).

Four trials were reported from Brazil at 0.15 kg ai/ha and three at 0.3 kg ai/ha, which did not correspond to GAP.

The levels of pyraclostrobin residues in chili peppers in trials conforming to GAP in the USA were 0.14, 0.22 and 0.82 mg/kg.

The Meeting agreed that no maximum residue level for chili pepper could be established.

Fruiting vegetables

GAP was reported for Canada (fruiting vegetable, cucurbits) and the USA (squash summer), at a rate of application of 0.22 kg ai/ha, four applications and a 0-day PHI.

Summer squash

In six trials conducted according to GAP on summer squash in the USA, the levels of residues, in ranked order, were: 0.03, 0.07, <u>0.14</u>, <u>0.17</u> and 0.18 mg/kg.

The Meeting estimated a maximum residue level of 0.3 mg/kg, an STMR of 0.15 mg/kg and a highest reside level of 0.18 mg/kg for summer squash.

Cucumber

Four trials were carried out on cucumber in Brazil at 0.1 kg ai/ha and three trials at 0.2 kg ai/ha, in accordance with GAP in Brazil (0.1 kg ai/ha, 3-day PHI). The pyraclostrobin residue levels were < 0.02 mg/kg.

The Meeting agreed that the data were insufficient, and no maximum residue level could be recommended.

Lettuce

No GAP was provided. Five trials in the USA were conducted at 0.22 kg ai/ha. The Meeting agreed that no maximum residue level for lettuce could be recommended.

Legume vegetables and pulses

Beans

GAP for beans in Brazil is a maximum rate of 0.075 kg ai/ha, three applications and a 14-day PHI; that in Canada is a maximum rate of 0.1kg ai/ha, two applications and a 30-day PHI; and that in the USA is a maximum rate of 0.2 kg ai/ha, two applications and a 30-day PHI.

In 10 trials conducted at 0.224 kg ai/ha, the residue levels 21 days after application were < 0.02 (eight), 0.04 and 0.10 mg/kg.

The Meeting estimated a maximum residue level of 0.2 mg/kg, an STMR of 0.02 mg/kg and a highest reside level of 0.10 mg/kg for dry beans.

The results of nine trials on snap beans were presented, but no GAP was available. The Meeting agreed that no maximum residue level for snap beans could be established.

Lentils

GAP was reported for Canada at a maximum rate of 0.1 kg ai/ha, two applications and a 30-day PHI. GAP in the USA is a maximum rate of 0.22 kg ai/ha with two applications.

Three trials were carried out in Canada, and three were conducted in the USA at a rate of 0.224 kg ai/ha. Pyraclostrobin residue levels in lentils in trials conforming to GAP in the USA were, in ranked order: 0.03, 0.08, <u>0.11</u>, <u>0.15</u>, 0.17 and 0.39 mg/kg.

The Meeting estimated a maximum residue level of 0.5 mg/kg, an STMR of 0.13 mg/kg and a highest reside level of 0.39 mg/kg for lentils.

Peas, dry

GAP in Canada for dry field peas is a maximum rate of 0.1 kg ai/ha, two applications and a 30-day PHI. That in the USA is a maximum rate of application of 0.224 kg ai/ha and a 30-day PHI. Six trials were conducted in Canada and two in the USA at the rate of 0.224 kg ai/ha.

The levels of pyraclostrobin residues in peas (dry) in trials conducted according to GAP in the USA, in ranked order, were: < 0.02 (two), 0.04, 0.05, 0.09, 0.13, 0.14, and 0.20 mg/kg.

The Meeting estimated a maximum residue level for peas, dry, of 0.3 mg/kg, an STMR of 0.07 mg/kg and a highest reside level of 0.20 mg/kg.

Peanut

GAP was reported for Argentina, Brazil and the USA. The critical GAP was that of the USA, which requires a maximum rate of 0.274 kg ai/ha, five applications and a 14-day PHI.

In four trials conducted in Brazil and 12 in the USA, no residues were detected in nutmeat (< 0.02 mg/kg).

The pyraclostrobin residue levels in peanut in trials conforming to GAP in Brazil and the USA were < 0.02 mg/kg or < 0.025 mg/kg (one). The Meeting estimated a maximum residue level of 0.05* mg/kg, an STMR of 0.02 mg/kg and a highest reside level of 0.025 mg/kg for peanut.

Soya bean

GAP was reported for Argentina, Brazil and Paraguay. GAP in Brazil is a maximum rate of 0.08 kg ai/ha with two applications and a 14-day PHI. One trial was conducted in Argentina and eight in Brazil (only four at GAP). In Argentina, the residue level was 0.03 mg/kg. In Brazil, results were presented only for grain. No residues were detected (< 0.02 mg/kg), even after application at 0.1 kg ai/ha.

The Meeting agreed that no maximum residue level for soya bean could be established.

Root and tuber vegetables

Carrot

GAP was reported for Brazil, Canada and the USA. The rate and number of applications are the same in Canada and the USA (0.22 kg ai/ha, three applications), but the PHI is 3 days in Canada and 0 days in the USA. In Brazil, the rate of application is lower (0.1 kg ai/ha) and the PHI is 7 days. One trial was conducted in Brazil and eight in the USA, only six of which were at GAP.

The levels of pyraclostrobin residues in carrots in trials conducted according to GAP in Brazil and the USA, in ranked order, were: 0.03 (two), 0.04, 0.12 (two), 0.15 and 0.24.mg/kg. The Meeting estimated a maximum residue level of 0.50 mg/kg, an STMR of 0.12 mg/kg and a highest reside level of 0.24 mg/kg for carrots.

Radish

GAP in the USA is a maximum application rate of 0.224 kg ai/ha, three applications and a 0-day PHI).The same GAP is applicable to horseradish. Five trials were carried out in the USA, and the values for radish tops and root were reported.

The levels of pyraclostrobin residues in radishes were 0.05, 0.07, 0.08, 0.23 and 0.30 mg/kg. The Meeting estimated a maximum residue level of 0.50 mg/kg, an STMR of 0.08 mg/kg and a highest reside level of 0.30 mg/kg for radish.

The residue levels in radish tops were 7.5, 9.6, 9.9, 12 and 15 mg/kg The Meeting estimated a maximum residue level of 20 mg/kg, an STMR of 9.9 mg/kg and a highest reside level of 15 mg/kg for radish tops.

Sugar beet

GAP in Canada and the USA is the same, with a maximum rate of 0.22 kg ai/ha, four applications and a 7-day PHI. In 12 trials conducted in USA according to GAP, the pyraclostrobin residue levels in sugar beet were: < 0.02 (two), 0.02, 0.03 (two), 0.04 (two), 0.06, 0.08 (two), 0.11 and 0.13 mg/kg. The Meeting estimated a maximum residue level of 0.2 mg/kg, an STMR of 0.04 mg/kg and a highest reside level of 0.13 mg/kg for sugar beet.

Potato

GAP was reported for Brazil, Canada and the USA. GAP in Brazil is a maximum rate of 0.1 kg ai/ha with five applications and a 3-day PHI, and GAP in the USA is a maximum rate of application of 0.219 kg ai/ha with six applications and a 3-day PHI.

In trials conducted according to GAP in Brazil, Canada and the USA, no residues were detected (< 0.02 mg/kg).

The Meeting estimated a maximum residue level for potatoes of 0.02* mg/kg and STMR and highest reside values of 0.02 mg/kg.

Cereal grains

Oats

GAP was reported for Brazil, Denmark, Estonia, France, Ireland, Latvia, Lithuania and the United Kingdom. The maximum rate of application was around 0.2 kg ai/ha with one to two applications and a PHI of 30 days.

Eight trials were conducted according to GAP in Brazil at 0.166, 0.2, 0.333 or 0.4 kg ai/ha. The levels of pyraclostrobin residues in oat grain were, in ranked order: 0.04, 0.05, 0.06, 0.14, 0.20, 0.23, 0.25 and 0.42 mg/kg. The Meeting estimated a maximum residue level of 0.5 mg/kg, an STMR of 0.17 mg/kg and a highest reside level of 0.42 mg/kg for oat grain.

Wheat

GAP was reported from Argentina, Belgium, Brazil, Canada, Denmark, Estonia, France, Germany, Ireland, Latvia, Lithuania, The Netherlands, Switzerland and the United Kingdom. The rate of application was 0.20–0.25 kg ai/ha with two applications and a 35-day PHI. GAP in the USA is a maximum of 0.22 kg ai/ha and a 40-day PHI.

In Brazil, eight trials were conducted according to GAP, four at 0.167 kg ai/ha and four at 0.2 kg ai/ha; 13 trials exceeded GAP: four at 0.3 kg ai/ha, three at 0.335 kg ai/ha, three at 0.4 kg ai/ha and three at 0.6 kg ai/ha. Thirty trials were conducted in Europe: one in Denmark, eight in France, five in Germany, two in The Netherlands, nine in Spain, one in Sweden and four in the United Kingdom. In North America, 11 trials were conducted in Canada and 23 in the USA according to US GAP.

The levels of pyraclostrobin residues in wheat grain in the trials conducted according to GAP in Brazil were: 0.02, 0.03 and 0.04 (two) mg/kg.

In all the European trials, samples of whole plant without roots were taken directly after the last application. On the third sampling day, at the proposed PHI of 35 days, various samples were taken, depending on ripening, with ears taken in 30 trials and grain in 27 trials. The pyraclostrobin residue levels in wheat grain in trials that conformed to GAP were: < 0.02 (22), 0.03, 0.04 (two), 0.05 and 0.09 mg/kg.

The residue levels in wheat grain in 11 trials in Canada and 23 trials in the USA that conformed to GAP were < 0.02 mg/kg.

The levels of pyraclostrobin residues in wheat grain in GAP trials in Brazil, Europe, Canada and the USA were of the same order of magnitude, and the Meeting decided that the data could be pooled. The residue levels, in ranked order, were: < 0.02 (56), 0.02, 0.03 (two), 0.04 (four), 0.05 and 0.09 mg/kg. The Meeting estimated a maximum residue level for wheat grain of 0.2 mg/kg, an STMR of 0.02 mg/kg and a highest reside level of 0.09 mg/kg.

Barley

GAP was reported for Belgium, Brazil, Canada, Denmark, Estonia, France, Germany, Ireland, Latvia, Luxembourg, Macedonia, Switzerland, the United Kingdom and the USA. GAP in Europe is a rate of application of 0.20–0.25 kg ai/ha, two applications and a 30–35-day PHI. Two trials were conducted according to GAP in Belgium, seven in France, four in Germany, three in Spain, five in Sweden and four in the United Kingdom, for a total of 25 trials.

The pyraclostrobin residue levels in barley grain in trials corresponding to GAP in Europe were, in ranked order: < 0.02 (six), 0.02 (two), 0.03 (six), 0.04 (four), 0.05 (two), 0.06, 0.07, 0.08, 0.09, 0.10, 0.29 and 0.32 mg/kg.

A total of 14 trials were carried out in Brazil, but only eight conformed to GAP. The residue levels in barley grain in the latter trials were, in ranked order: 0.04, 0.05, 0.06, 0.07, 0.08 (three) and 0.09 mg/kg.

In the 26 trials conducted in the USA on barley grain according to GAP (0.22 kg ai/ha), the pyraclostrobin residue levels, in ranked order, were: < 0.02 (19), 0.03 (three), 0.05 (two), 0.07 and 0.14 mg/kg.

As GAP in Brazil, Europe and the USA is similar and the residue levels were in the same range, the results were combined. The levels, in ranked order, were: < 0.02 (25), 0.02 (two), 0.03 (nine), 0.04 (five), 0.05 (five), 0.06 (two), 0.07 (three), 0.08 (four), 0.09 (two), 0.10, 0.14, 0.29 and 0.32 mg/kg.

The Meeting estimated a maximum residue level for barley grain of 0.5 mg/kg, an STMR of 0.03 mg/kg and a highest reside level of 0.32 mg/kg.

Maize

GAP in Brazil allows two applications of 0.15 kg ai/ha or 0.1 kg ai/ha with a 45-day PHI on maize.

Four trials were conducted at 0.2 kg ai/ha and four at 0.133 kg ai/ha. The residue levels in trials conforming to GAP were < 0.02 mg/kg.

The Meeting estimated a maximum residue level for maize of 0.02* mg/kg and STMR and highest reside values of 0.02 mg/kg.

Rye

GAP in the USA allows two applications of 0.22 kg ai/ha with a 40-day on rye. In five trials conducted at 0.22 kg ai/ha but with a PHI of about 60 days, the pyraclostrobin residue levels in rye were < 0.02 mg/kg at 60 days.

The Meeting agreed that no maximum residue level for rye could be estimated.

Tree nuts

GAP was reported from the USA for beechnut, Brazil nut, butter nut, cashew, macadamia nut, pecan, walnut and pistachio. The rate of application was 0.13 kg ai/ha, with four applications and a waiting period of 14 days (pecan and pistachio). For almond, the new GAP was 0.13 kg ai/ha, with four applications and a waiting period of > 100 days.

Almond: Ten trials were carried out in the USA with a 120-day PHI. The results for nutmeat were < 0.02 mg/kg. The Meeting estimated a maximum residue level of 0.02*mg/kg, an STMR of 0.02 mg/kg and a highest reside level of 0.02 mg/kg.

Pecan: Ten trials were conducted in the USA according to GAP. Pyraclostrobin residue levels in pecan were < 0.02 mg/kg. The Meeting estimated a maximum residue level of 0.02*mg/kg, an STMR of 0.02 mg/kg and a highest reside level of 0.02 mg/kg for pecan.

Pistachio: Six trials were carried out in the USA according to GAP. The pyraclostrobin residue levels were: 0.02 (two), 0.16, 0.27, 0.44 and 0.45 mg/kg. The Meeting estimated a maximum residue level of 1 mg/kg, an STMR of 0.22 mg/kg and a highest reside level of 0.45 mg/kg for pistachio.

Coffee

GAP in Brazil is a maximum rate of 0.2 kg ai/ha with two applications and a 45-day PHI. Four trials were conducted at 0.175 kg ai/ha and three at 0.35 kg ai/ha. The pyraclostrobin residue levels were < 0.02 (two), 0.03 and 0.15 mg/kg.

The Meeting agreed that no maximum residue level for coffee could be estimated

Animal feedstuffs

Fodder beet leaves and tops

GAP is the same for Canada and the USA, with a maximum rate of 0.22 kg ai/ha, four applications and a 7-day PHI. In 12 trials conducted in the USA according to GAP, the levels of pyraclostrobin residues, in ranked order, were: 0.28, 1.3, 1.4, 1.5 (two), 1.6, 1.7, 2.0, 2.6, 2.8, 3.9 and 5.3 mg/kg.

Eight trials were conducted in Europe and reported, but the registration is pending.

The Meeting estimated a maximum residue level of 10 mg/kg, an STMR of 1.64 mg/kg and a highest reside level of 5.3 mg/kg for sugar beet tops. On a dry basis, the maximum residue level was 50 mg/kg, the STMR was 7.1 mg/kg and the highest reside level was 23 mg/kg.

Peanut hay

GAP was reported for Argentina, Brazil and the USA. The critical GAP is 0.274 kg ai/ha with five applications and a 14-day PHI. In 12 trials conducted according to GAP in the USA, the pyraclostrobin residue levels in peanut hay, in ranked order, were: 1.5, 3.3, 4.0, 4.8, 4.9, 9.0, 15, 18, 19 (two) and 24 mg/kg.

The Meeting estimated a maximum residue level of 50 mg/kg, an STMR of 9.0 mg/kg and a highest reside level of 24 mg/kg for peanut hay.

On the basis of the dry matter, which is listed as 85% in the *FAO Manual*, the STMR is equivalent to 11 mg/kg and the highest reside level to 29 mg/kg. These values were used to calculate the animal burden.

Pea hays and vines

GAP was reported for Canada (dried field peas, 0.1 kg ai/ha with two applications and a 30-day PHI) and the USA (0.22 kg ai/ha and a 30-day PHI). Six trials were conducted in Canada and two in the USA at an application rate of 0.224 kg ai/ha.

The levels of pyraclostrobin residues in pea vines in trials conforming to GAP in the USA were: 3.3, 3.8, 4.2, 5.0, 5.1, 5.5 (two) and 7.0 mg/kg.

The Meeting estimated a maximum residue level for pea vines of 10 mg/kg, an STMR of 5.1 mg/kg and a highest reside level of 7.0 mg/kg.

On the basis of the dry matter, which is listed as 25% in the *FAO Manual*, the maximum residue level was estimated at 40 mg/kg, the STMR at 20 mg/kg and the highest reside level at 28 mg/kg in pea vine. These values were used to calculate the animal burden.

The levels of pyraclostrobin residues in pea hay in trials conforming to GAP in the USA were: 4.9, 5.3, 6.4, 7.2, 7.5, 9.2, 12 and 18 mg/kg.

The Meeting estimated a maximum residue level for pea hay of 20 mg/kg, an STMR of 6.8 mg/kg and a highest reside level of 18 mg/kg.

On the basis of the dry matter, which is listed as 88% in the *FAO Manual*, the maximum residue level was estimated at 30 mg/kg, the STMR at 7.8 mg/kg and the highest reside level at 20 mg/kg in pea hay.

Barley straw, hay (fodder) and haulms

GAP was reported for Belgium, Brazil, Canada, Denmark, Estonia, France, Germany, Ireland, Latvia, Luxembourg, Macedonia, Switzerland, the United Kingdom and the USA. The maximum rate of application is 0.2–0.25 kg ai/ha with two applications and a 30–35-day PHI. In Europe, 25 trials were conducted, with two in Belgium, seven in France, four in Germany, three in Spain, five in Sweden and four in the United Kingdom.

The levels of pyraclostrobin residues in barley straw in trials that complied with GAP in Europe were: 0.48, 0.66, 0.78 (two), 0.72, 0.84, 0.99, 1.0, 1.7 (two), 1.8, 2.0, 2.6 (two), 2.8 (three), 3.9, 4.4 (two), 4.8, 4.9, 5.7, 5.8 and 6.9 mg/kg.

The levels of pyraclostrobin residues in barley straw in trials that complied with GAP in Canada and the USA were: 0.09, 0.12 (two), 0.26, 0.30 (two), 0.31, 0.32 (two), 0.39, 0.45, 0.52, 0.57, 0.82, 1.1, 1.3, 1.4, 1.5 (two), 1.9, 2.4, 2.8 and 4.0 mg/kg.

The Meeting agreed to combine the above results for estimating a maximum residue level for barley straw. The residue levels, in ranked order, were: 0.09, 0.12 (two), 0.26, 0.30 (two), 0.31, 0.32 (two), 0.39, 0.45, 0.48, 0.52, 0.57, 0.66, 0.72, 0.78 (two), 0.82, 0.84, 0.99, 1.0, 1.1, 1.3, 1.4, 1.5 (two), 1.7 (two), 1.8, 1.9, 2.0, 2.4, 2.6 (two), 2.8 (four), 3.9, 4.0, 4.4 (two), 4.8, 4.9, 5.7, 5.8 and 6.9 mg/kg.

The levels of pyraclostrobin residues in barley haulms in trials that complied with GAP in Europe were: 0.41, 0.53, 0.54, 0.58, 0.72, 0.73, 0.74, 0.87, 0.88, 0.98, 1.2, 1.3, 1.4 (two), 1.5, 1.6, 1.7, 1.8, 2.5, 3.2, 3.4, 4.1, 4.3, 6.6 and 7.6 mg/kg.

The levels of pyraclostrobin residues in barley hay in trials that complied with GAP in Canada and the USA were: 0.93, 0.96, 1.0 (two), 1.1, 1.2, 1.3, 1.5, 1.6 (three), 1.9, 2.1, 2.2 (two), 2.5, 2.8, 3.2 (two), 3.6, 3.7, 12 (two), 17 and 19 mg/kg.

Wheat straw, hay (fodder) and haulms

GAP was reported for Argentina, Belgium, Brazil, Canada, Denmark, Estonia, France, Germany, Ireland, Latvia, Lithuania, The Netherlands, Switzerland, the United Kingdom and the USA. The rate of application is 0.20–0.25 kg ai/ha with two applications and a 35-day PHI.

In 27 trials in Europe, samples of whole plant without roots were taken directly after the last application, and samples of haulms and straw were taken about 3 weeks after the last application. On the third sampling day, which was at the proposed 35-day PHI, various samples were taken, depending on ripening; in 27 trials, haulms and straw were taken.

The levels of pyraclostrobin residues in wheat straw in trials that conformed to GAP in Europe were: 0.67, 0.75, 0.87, 1.2, 1.4, 1.5, 1.6, 1.7, 1.7 (two), 1.8, 1.9 (two), 2.0 (two), 2.1, 2.2, (five), 2.3, 2.5, 3.2, 5.0, 5.5 and 5.7 mg/kg.

The levels of pyraclostrobin residues in wheat straw in trials that conformed to GAP in Canada and the USA were: 0.03, 0.06, 0.07, 0.09, 0.10 (two), 0.11, 0.12, 0.13 (two), 0.15, 0.20, 0.21, 0.23, 0.24, 0.32, 0.34, 0.37, 0.52, 0.56, 0.74, 0.85, 0.90, 0.95, 1.1, 1.6, 1.7, 2.2, 3.5, 3.8 and 4.1 mg/kg.

The Meeting agreed to combine the above results for estimating a maximum residue level for wheat straw. The residue levels, in ranked order, were: 0.03, 0.06, 0.07, 0.09, 0.10 (two), 0.11, 0.12, 0.13 (two), 0.15, 0.20, 0.21, 0.23, 0.24, 0.32, 0.34, 0.37, 0.52, 0.56, 0.67, 0.74, 0.75, 0.85, 0.87, 0.90, 0.95, 1.1, 1.2, 1.4, 1.5, 1.6 (two), 1.7 (four), 1.9 (three), 2.0 (two), 2.1, 2.2 (six), 2.3, 2.5, 3.1, 3.5, 3.8, 4.1, 5.0, 5.5 and 5.7 mg/kg.

The levels of pyraclostrobin residues in wheat haulms in trials that conformed to GAP in Europe were: 0.50, 0.52, 0.56, 0.62, 0.74, 0.75, 0.79, 0.81, 0.84, 0.85, 0.89, 0.92, 0.94, 0.96, 0.98, 0.99, 1.0 (two), 1.1, 1.2, 1.3 (two), 1.4 (two), 1.5, 1.6, 1.9, 2.7 (two) and 3.2 mg/kg.

The levels of pyraclostrobin residues in wheat hay in trials that conformed to GAP in Canada and the USA were: 0.21, 0.24, 0.27, 0.43, 0.46, 0.49, 0.54, 0.72, 0.75, 0.83, 0.89, 0.91, 0.93, 0.95, 1.0 (two), 1.1, 1.2, 1.4 (two), 1.5 (two), 1.6, 1.8 (two), 1.9, 2.0, 2.2 (two), 2.3, 3.0, 3.1 and 4.6 mg/kg.

Rye straw

GAP was reported from the USA at a rate of application of 0.2–0.25 kg ai/ha with two applications and a 40-day PHI. Five trials were conducted but with a longer PHI. The levels of pyraclostrobin residues were 0.11, 0.14, 0.17, 0.27 and 0.30 mg/kg.

The Meeting agreed that no maximum residue level for rye straw could be estimated.

The Meeting agreed to combine the results for barley and wheat straw (106 trials) in estimating a maximum residue level for cereal straw. The residue levels, in ranked order, were: 0.03, 0.06, 0.07, 0.09 (two), 0.10 (two), 0.11, 0.12 (three), 0.13 (two), 0.15, 0.20, 0.21, 0.23, 0.24, 0.26, 0.30 (two), 0.31, 0.32 (three), 0.34, 0.37, 0.39, 0.45, 0.48, 0.52 (two), 0.56, 0.57, 0.66, 0.67, 0.72, 0.74, 0.75, 0.78 (two), 0.82, 0.84, 0.85, 0.87, 0.90, 0.95, 0.99, 1.03, 1.1 (two), 1.2, 1.3, 1.4 (two), 1.5 (three), 1.6 (two), 1.7 (six), 1.8 (two), 1.9 (three), 2.0 (two), 2.1 (two), 2.2 (six), 2.3, 2.4, 2.5, 2.6 (two), 2.8 (four), 3.1, 3.5, 3.8, 3.9, 4.0, 4.10, 4.4 (two), 4.8, 4.9, 5.0, 5.5, 5.7 (two), 5.8 and 6.9 mg/kg.

The Meeting agreed to combine the results for barley and wheat fodder (59 trials) in estimating a maximum residue level for cereal fodder. The residue levels, in ranked order, were: 0.21, 0.24, 0.27, 0.43, 0.46, 0.49, 0.54, 0.72, 0.75, 0.83, 0.89, 0.91, 0.93 (two), 0.95, 0.96, 1.0 (four), 1.1 (two), 1.2 (two), 1.3, 1.4 (two), 1.5 (three), 1.6 (four), 1.8 (two), 1.9 (two), 2.0, 2.1, 2.2 (four), 2.3, 2.5, 2.8, 3.0, 3.1, 3.2 (two), 3.6, 3.7, 4.6, 11, 12, 17 and 19 mg/kg.

Allowing for the standard 88% dry matter for cereal straw and fodder (*FAO Manual* p. 49), the Meeting estimated a maximum residue level of 30 mg/kg, an STMR of 1.69 mg/kg and a highest reside level of 21.7 mg/kg. The highest reside level was taken into account in calculating the animal dietary burden.

Almond hulls

GAP was reported from the USA with 10 trials conducted according to GAP. The levels of pyraclostrobin residues in almond hulls were: < 0.02 (two), 0.11, 0.16, 0.19, 0.21, 0.47, 0.55, 0.87 and 1.3 mg/kg.

The Meeting estimated a maximum residue level of 2 mg/kg, an STMR of 0.20 mg/kg and a highest reside level of 1.34 mg/kg for almond hulls. The highest reside level was taken into account in calculating the animal dietary burden.

Fate of residues during processing

Studies were conducted on grapes, barley and wheat, and the respective intermediate end- and waste products were analysed. For grapes, the data covered whole grapes, cold must, heated must, wet pomace, wine from cold must, wine from heated must, juice and raisins. For barley, the data covered pearling dust, pot barley, malt, malt germs, spent grain, trub (flocks), beer yeast and beer. For wheat, flour, bran, middlings, shorts and germ were analysed.

The processing factors for total residues in the transformation from *grape* to must, wine and juice were < 1 (0.08–0.013), indicating that the residues did not concentrate. Concentration factors of 2.4–5.6 were calculated for residues in processing from whole grape to pomace; the concentration factor for total residues in processing from whole grapes to raisins was 3.1, which may be due to loss of water during processing.

In the processed fractions obtained for pot *barley* and beer production, such as pearling dust, malt, malt germs, spent grain, trub (flocks) and beer yeast, none of which are meant for consumption, the residues of pyraclostrobin showed some concentration, with factors ranging from 1.29 to 7.86. In the final products to be consumed, such as pot barley and beer, however, no concentration of pyraclostrobin residues was observed, as expressed by processing factors of < 1 (< 0.6). The processing factor from barley to beer cannot be calculated owing to the low contamination of barley, but the transfer factor can be assumed to be low.

The processing factors for total residues in the transformation from *wheat* grain to all processed fractions were < 1 (< 0.6), indicating that the residues did not concentrate. The transfer factor for wheat germ was 0.8. The processing factors and STMR-P values for all the commodities investigated were:

Commodity	Processing factor	STMR-P (mg/kg)
Grape juice	0.013	0.005
Wine	< 0.1	< 0.044
Must	0.15	0.07
Wet pomace	2.4–5.6	2.46
Raisin	3.1	1.36
Malt	1	0.03
Beer	< 0.6	< 0.025
Wheat flour	< 0.6	< 0.01
Wheat bran	< 0.6	< 0.01
Wheat germ	0.8	0.016

RESIDUES IN ANIMALS COMMODITIES

Dietary burden of farm animals

The Meeting estimated the dietary burden of pyraclostrobin residues in farm animals on the basis of the diets listed in Appendix IX of the *FAO Manual*. The percentage of dry matter is taken as 100% when MRLs and STMR values are expressed as dry weight.

Estimated maximum dietary burden of farm animals

Commodity	Group	Residue (mg/kg highest residue)	Residue (mg/kg on dry matter basis)[a]	Dietary content (%)			Residue contribution (mg/kg)		
				Beef cattle	Dairy cattle	Poultry	Beef cattle	Dairy cattle	Poultry
Almond hulls	AM	1.34	1.34						
Barley grain	GC	0.36	0.36	50	40	75	0.18		0.27
Cereal fodder	AS	21.7	21.7	25	60/50		5.4	10.8	
Sugar beet	AB	0.15	0.15						
Peanut hay	AL	28.8	28.8	25	50		7.28	14.4	
Pea hay	AL	20.5	20.5						
Pea vines	AL	28	28	25	50				
Fodder beet leaves	AV	23	23						
Total				100	100	75	12.9	25.2	0.27

[a] 100% dry matter for all commodities

Estimated median dietary burden of farm animals

Commodity	Group	Residue (mg/kg on STMR basis)	Residue (mg/kg on dry matter basis)[a]	Dietary content (%)			Residue contribution (mg/kg)		
				Beef cattle	Dairy cattle	Poultry	Beef cattle	Dairy cattle	Poultry
Almonds hulls	AM	0.2	0.22	10	10				
Barley grain	GC	0.034	0.034	50	40	75	0.017	0.014	0.025
Cereal fodder	AS	1.69	1.69	10	60				
Fodder beet tops	AV	7.1	7.1	20	10		1.42	0.71	
Sugar beet	AB	0.045	0.045	20	20				
Peanut hay	AL	10.6	10.6	25	50				
Pea hay	AL	7.75	7.75	25	50				
Pea vines	AL	20.2	20.2	25	50		5.06	10.1	
Total				95	100	75	6.5	10.8	0.025

[a] 100% dry matter for all commodities

The dietary burdens of pyraclostrobin for estimates of STMR and highest reside level values in animal commodities (residue levels in animal feeds expressed as dry weight) are, respectively, 6.5 mg/kg and 12.9 mg/kg for beef cattle, 10.8 mg/kg and 25.2 mg/kg for dairy cattle and 0.025 mg/kg and 0.27 mg/kg for poultry.

Feeding studies

In one feeding study, dairy cows were given feed containing pyraclostrobin at 0, 8.8, 27.2 or 89.6 mg/kg for 28 days. No residues of pyraclostrobin were detected in milk, meat, fat, kidney or tissues from the group given the concentration relevant to normal agricultural conditions (27.2 mg/kg) or at the other two concentrations. Low levels of pyraclostrobin metabolites might occur in liver.

The Meeting decided not consider these studies, as pyraclostrobin is fat-soluble and no residues were detected. The study of metabolism in goats, summarized below, was used to estimate residues in animal products.

Tissue	Residue (mg/kg)						
	At 12 ppm		At 50 ppm		Value taken into account	Dietary burden estimate (ppm)	
	Chlorophenyl label	Tolyl label	Chlorophenyl label	Tolyl label		25.2	10.8
Milk[a]	0.012	0.01	0.067	0.027	0.047	0.0236	0.01
Muscle	0.01	0.01	0.089	0.048	0.089	0.044	0.009
Fat	0.069	0.061	0.82	0.32	0.82	0.41	0.063
Liver	0.008[b]	0.006[b]	0.021	0.07	0.07	0.035	0.007
Kidney	0.01[b]	0.007[b]	0.074[b]	0.073[b]	0.074	0.037	0.009

[a] Mean values; comprises pyraclostrobin and metabolite 500M07
[b] Comprises pyraclostrobin and metabolite 500M07 at the lower dose for liver and at both doses for kidney

Maximum residue levels

On the basis of the estimated residue levels at the calculated dietary burdens, the Meeting recommended a maximum residue level of 0.03 mg/kg and an STMR of 0.01 mg/kg for milk.

The Meeting recommended a maximum residue level of 0.5 mg/kg for meat (fat) of mammals other than marine mammals and for edible offal, an STMR of 0.008 mg/kg and a highest reside level of 0.037 mg/kg for edible offal, an STMR of 0.009 mg/kg and a highest reside level of 0.044 mg/kg for muscle, and an STMR of 0.063 mg/kg and a highest reside level of 0.41 mg/kg for fat.

No feeding study was performed in chickens. The Meeting noted that in the study of metabolism in laying hens, pyraclostrobin was not detected in tissues (< 0.002 mg/kg) or eggs (< 0.002 mg/kg) at a feeding level of 12 mg/kg, which was 30 times higher than the calculated dietary burden (0.27 ppm).

The Meeting agreed that it is unlikely that pyraclostrobin residues will be detected in the products of poultry fed commodities treated with this compound. The Meeting estimated a maximum residue level of 0.05* mg/kg and STMR and highest reside level values of 0 for pyraclostrobin in eggs, meat (fat) and edible offal of poultry.

RECOMMENDATIONS

On the basis of the data from supervised trials, the Meeting concluded that the residue levels listed below are suitable for establishing maximum residue limits and for IEDI assessment.
The definition of the residue is pyraclostrobin and is applied to plant and animal commodities. The residue is fat soluble

Summary of recommendations for MRLs, STMRs and HRs for pyraclostrobin

CCN	Commodity	MRL, mg/kg		STMR or STMR-P, mg/kg	HR or HR/P mg/kg
		New	Previous		
AM 0660	Almond hull	2			
TN 0660	Almond	0.02(*)		0.02	0.02
FI 0327	Bananas	0.02(*)		0.02	0.02
GC 0640	Barley	0.5		0.03	
	Malt			0.03	
VD 0071	Beans dry	0.2		0.02	0.10
FB 0020	Blueberries	1		0.34	0.57
VR 0577	Carrots	0.5		0.12	0.24
FS 0243	Cherries	1		0.43	0.63
FC 0001	Citrus fruit	1		0.19	0.51
DF 0269	Dried grapes (raisins)	5		1.36	4.27
MO 0095	Edible offal, mammalian	0.05(*)		0.008	0.037
PE 0112	Eggs	0.05(*)		0	0
AV 0659	Fodder beet leaves or tops (dry)	50			
VA 0381	Garlic	0.05(*)		0.05	0.05
FB 0269	Grapes	2		0.44	1.38
JF0269	Grape juice			0.005	
	Wine			0.04	
VD 0533	Lentil (dry)	0.5		0.13	
GC 0645	Maize	0.02(*)		0.02	
FI 0345	Mango	0.05(*)		0.05	0.05
MM 0095	Meat (from mammals other than marine mammals)	0.5 (fat)		meat muscle 0.009 meat fat:0.063	meat muscle 0.044 meat fat:0.41:
ML 0106	Milks	0.03		0.01	
GC 0647	Oat	0.5		0.17	
VA 0385	Onions, bulb	0.2		0.02	0.09
FI 0350	Papaya	0.05*		0.05	0.05
FS 0247	Peaches	0.50		0.15	0.31
SO 0703	Peanut	0.02(*)		0.02	0.02
AL 0697	Peanut fodder dry	50			
VD 0561	Pea (dry)	0.3		0.07	
	Peas vines	40			
	Peas hay	30			
TN 0672	Pecan	0.02(*)		0.02	0.02
TN 0678	Pistachio	1		0.22	0.45
FS 0014	Plum (including prune)	0.3		0.06	0.19
VR 0589	Potatoes	0.02(*)		0.02	0.02
PM 0110	Poultry meat	0.05(*)		meat muscle 0 meat fat: 0	meat muscle 0 meat fat:0
PO 0111	Poultry, edible offal of	0.05(*)		0	0
VR 0494	Radish	0.5		0.08	0.3
VL 0494	Radish top	20		9.9	15

CCN	Commodity	MRL, mg/kg		STMR or STMR-P, mg/kg	HR or HR/P mg/kg
		New	Previous		
VC 0431	Squash Summer	0.3		0.15	0.18
AS 0081	Straw and fodder of grain cereal (dry)	30		1.69	
FB 0275	Strawberry	0.5		0.16	0.26
VR 0596	Sugar beet	0.2		0.04	
VO 0448	Tomato	0.3		0.12	0.21
GC 0654	Wheat	0.2		0.02	
CF1211	Wheat flour			0.012	
CF 1210	Wheat germ			0.016	

DIETARY RISK ASSESSMENT

Chronic intake

The International Estimated Daily Intake (IEDI) of pyraclostrobin calculated on the recommendations made at this Meeting for the five GEMS/Food regional diets ranged from 0- 3 % of the ADI (0-0.03 mg/kg/day on 2 years rat study).

The meeting concluded that the long term intake of residues of pyraclostrobin resulting from the uses that have been considered by the JMPR is unlikely to present a public health concern.

Short term intake

The International Estimated Short Term Intake (IESTI) of pyraclostrobin based on the recommendations made at this meeting ranged from 0 to 90 % of the ARfD (0-0.05 mg/kg/day on rabbit development) for children and from 0-40 % for general population.

The Meeting concluded that the short term intake of residues of pyraclostrobin resulting from its uses that have been considered by the JMPR is unlikely to present a public health concern

REFERENCES

Abdel-Baky S.-2000a-Storage stability of BAS 500 F and BF 500-3 in various plant matrices including processed commodities for up to 19 months of frozen storage

BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
2000/5248

Abdel-Baky S.-2000b-Analysis of BAS 500F in apples, oats, wheat, barley, soybeans,corn, grapes and peanut after treatment with BAS 500 F in Brazil (2000)
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
2000/5241

Abdel-Baky S., Riley M.-1999-Freezer storage stability of BAS 500 F and BF 500-3 in various plant matrices including processed commodities Interim report for up to 6 months of freezer storage
BASF Corporation Chemicals Division; Parsippany; United States of America
1999/5064

Abdel-Baky S., Riley M.-2000a-Validation of BASF analytical method D9904, method for determination of BAS 500 F and its metabolite BF 500-3 residues in plant matrices using HPLC/UV
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5179

Abdel-Baky S., Riley M.-2000b-Validation of BASF analytical method D9904, method for determination of BAS 500 F and its metabolite BF 500-3 residues in plant matrices using HPLC/UV
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5179

Bayer H.-1999-Storage stability of BAS 500 F in terrestrial soil samples
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11288

Beck J. *et al*.-1999a-Study on the residue behavior of BAS 500 F, epoxiconazole and kresoxim-methyl in cereals after treatment with BAS 500 01 F, BAS 512 00 F and BAS 513 00 F under field conditions in Belgium,

France, Germany, Great Britain, Spain, Sweden and the Netherlands, 1998
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11509

Beck J. *et al*.-1999b-Study on the residue behavior of BAS 500 F in cereals after treatment with BAS 500 01 F under field conditions in Denmark, France, Germany, Great Britain, Spain and Sweden, 1999
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11824

Bross M., Mackenroth C.-1999-The metabolism of 14C-BAS 500 F (14C-Reg. . 304428) in potato
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11419

Bross M., Mackenroth C.-2000a-Report amendment . 1 to final report: The metabolism of 14C-BAS 500 F (14C-Reg. . 304 428) in potato
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
2000/1000048

Bross M., Mackenroth C.-2000b-BAS 500 F: Petition for EC Import Tolerances - Summary of residue data of BAS 500 F on raw agricultural commodities and process fractions from field trials conducted in the United States and Canada in 1997 to 1999 including MRL proposals and risk assessment
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
2000/1013435

Bross M., Tilting N.-2000-Investigation of the metabolism of 14C-BAS 500 F in the goat
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
2000/1000004

Bross M., Tilting N.-2001-Efficiency of the extraction procedure in methods for the determination of pyraclostrobin in matrices of animal origin
BASF AG; Ludwigshafen/Rhein; Germany Fed.Rep.
2001/1001011

Burkey J.D., Huntsinger D.-2000-Statement to: Independent method validation of BASF analytical method D9904 entitled: Method for the determination of BAS 500F and its metabolite BF 500-3 residues in plant matrices using HPLC-UV
BASF Corporation Chemicals Division; Parsippany; United States of America
2000/1003597

Ebert D.-1998-The aerobic soil metabolism of 14C-BAS 500 F
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1998/11201

Ebert D.-1999a-The aerobic soil metabolism of 14C-BAS 500 F
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/10090

Ebert D.-1999b-The degradation behaviour of 14C-BAS 500 F in different soils (DT50/DT90)
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11091

Ebert D.-1999c-Investigations on the release of soil-bound residues of 14C-BAS 500 F by earthworms
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11289

Ebert D.-1999d-Degradation of BAS 500 F in aerobic aquatic environment under irradiated conditions
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11791

Hafemann C., Knoell H.-E.-1999-Metabolism of (14C)BAS 500 F in laying hens
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11480

Hamm R.T.-1998-Metabolism of BAS 500 F in grapes
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1998/10988

Hamm R.T.-2000-Report Amendment . 1 to final report: Metabolism of BAS 500 F in grapes
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
2000/1000201

Haughey D. *et al*.-1999a-The Magnitude of BAS 500 F Residues in Strawberries
BASF Corporation Chemicals Division; Parsippany; United States of America
1999/5140

Haughey D. *et al*.-1999b-The magnitude of BAS 500 F residues in sugar beets
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5157

Haughey D. *et al*.1999c--The magnitude of BAS 500 F residues in pecans
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5152

Haughey D.. *et al*.-1999d-The magnitude of BAS 500 F residues in pistachios
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5150

Haughey D.. *et al*.-1999e-The magnitude of BAS 500 F residues in rye
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA

1999/5107

Haughey D. *et al*.-2000-The magnitude of BAS 500 F residues in almonds
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5161

Jordan J.-2000-Independent method validation of BASF analytical method D9904 entitled method for the determination of BAS 500 F and its metabolite BF 500-3 esidues in plant matrices using HPLC-UV
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5184

Kaestel R.-1997-Physical properties report for 304 428
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1997/10646

Kaestel R.-1998-Physical and chemical properties report for PS 304 428
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1998/10768

Kampke-Thiel K.-1999-Validation of BASF method 439/0 for the determination of BAS 500 F (as parent compound) in matrices of animal origin
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11079

Kellner O.-1999a-The anaerobic soil metabolism of BAS 500 F (14C-Tolyl)
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/10079

Kellner O.-1999b-The anaerobic soil metabolism of BAS 500 F (14C-Chlorophenyl)
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11103

Kellner O.,Zangmeister W.-1999c-Field soil dissipation of BAS 500 F (304428) in formulation BAS 500 01 F
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11292

Kellner O.,Zangmeister W.-1999d-Field soil dissipation of BAS 500 F (304428) in formulation BAS 500 01 F (1998 - 1999)
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11301

Leibold E. *et al*.-1998a-14C-BAS 500 F - Absorption, distribution and excretion after repeated oral administration in lactating goats
BASF AG; Ludwigshafen/Rhein; Germany Fed.Rep.
1998/10636

Leibold E. *et al*.-1998b-14C-BAS 500 F - Study of the absorption, distribution and excretion after repeated oral administration to laying hens
BASF AG; Ludwigshafen/Rhein; Germany Fed.Rep.
1998/10637

Levsen K.-1999-Independent validation of BASF method 439/0 for the determination of BAS 500 F (as parent compound) in matrices of animal origin
Fraunhofer-Institut für Toxikologie und Aerosolforschung; Han ver; Germany Fed.Rep.
1999/11369

Loeffler U.-1998-Safety characteristics of the crop protection product PS 304 428
BASF AG; Ludwigshafen/Rhein; Germany Fed.Rep.
1998/10734

Meumann H. *et al*.-1999a-Study on the residue behaviour of BAS 500 F in grapes after eight treatments with BAS 500 00 F under field conditions in France and Germany, 1997
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/10980

Meumann H. *et al*.-1999b-Study on the residue behavior of BAS 500 F in grapes after treatments with BAS 500 00 F under field conditions in France, Germany and Spain, 1998
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/10981

Meumann H. *et al*.-1999c-Study on the residue behavior of BAS 500 F in grapes and grape process fractions after treatments with BAS 500 00 F under field conditions in Germany, 1998
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/10982

Meumann H. *et al*.-1999d-Evaluation of the residue behavior of BAS 500 F after application of BAS 500 01 F in cereals under field conditions in Germany, France and Sweden, 1998
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11825

Ohnsorge U.-2000-Henry's law constant for 304 428
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
2000/1000171

Perez R., Perez S.R.-2000-Independent Method Validation of BASF Method Numbers D9808 (USA) and 421/1 (Germany) entitiled "Method for Determination of BAS 500 F and Its Metabolitie BF 500-3 Residues in Plant Matrices Using LC/MS/MS
ADPEN Laboratory Inc.; Jacksonville, Florida; United States of America
1999/5187

Regenstein H.-2000-Statement - BAS 500 F: Residues in bananas below LOD

Agricultural Products Center; Research Triangle Park, NC 27709-3528; United States of America
2000/1004148

Regenstein H.-2003 – Analysis of BAS 500 F: Residues in plant Matrices from Brazil citrus, cucumber, garlic, onion and red pepper
BASF Registration document
2003/1012786

Reinhard K.-1999e-Metabolism of 14C-BAS 500 F in wheat
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11137

Reinhard K., Mackenroth C.-1999a-Validation of BASF method . 421/0 (Germany)/D9808 (USA): Determination of BAS 500 F and its metabolite BF 500-3 in wheat, grape, peanut and orange matrices
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11134

Reinhard K., Mackenroth C.-1999b-Validation of BASF method . 453/0: Determination of BAS 500 F and its metabolite BF 500-3 in matrices/fractions of the processing of barley
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11135

Reinhard K., Mackenroth C.-1999c-Extractability of 14C-BAS 500 F residues from wheat and grape matrices with aqueous metha l (according to method . 421/0)
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11138

Reinhard K., Mackenroth C.-1999d-Report amendment . 1 to final report: Extractability of 14C-BAS 500 F residues from wheat and grape matrices with aqueous metha l (according to method . 421/0)
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11700

Reuschenbach P.-1999-Determination of the biodegradability of BAS 500 F in the ma metric respirometry test according to GLP, EN 45001 and ISO 9002
BASF AG; Ludwigshafen/Rhein; Germany Fed.Rep.
1999/10655

Scharf J.-1999a-Hydrolysis of BAS 500 F
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/10060

Scharf J.-1999b-Photochemical oxidative degradation of BAS 500 F (QSAR estimates)
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/10086

Scharf J.-1999f-Aqueous photolysis of BAS 500 F
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11286

Scharf J.-1998b-Hydrolysis of BAS 500 F at 90°C, 100°C, and 120°C
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1998/10840

Scharf J.-1998a-Determination of the absorption coefficients of BAS 500 F
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1998/10257

Scharf J.-1999a-Hydrolysis of BAS 500 F
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/10060

Scharf J.-1999b-Photochemical oxidative degradation of BAS 500 F (QSAR estimates)
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/10086

Scharf J.-1999c-Volatilization of BAS 500 F after application of BAS 500 00 F on soil and on plant surfaces
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11093

Scharf J.-1999d-Aqueous photolysis of BAS 500 F
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11286

Scharf J.-1999e-Soil photolysis of BAS 500 F
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11300

Schat B., Beelen G.M.-1999-Feeding study with BAS 500 F (Reg. . 304428) in lactating dairy cows
T Voeding; 3700 AJ Zeist; The Netherlands
1999/11895

Schulz H.-1999-Determination of the residues of BAS 500 F in grapes following treatment with BAS 500 00 F under field conditions in Italy 1998
Institut Fresenius, Chemische und Biologische Laboratorien GmbH; Taunusstein; Germany Fed. Rep.
1999/11638

Schulz H., Scharm M.-2000a-Determination of the residues of BAS 500 F in barley and processed products following treatment with BAS 500 01 F under field conditions in Germany 1999
Institut Fresenius, Chemische und Biologische Laboratorien GmbH; Taunusstein; Germany Fed. Rep.
1999/11826

Schulz H., Scharm M.-2000b-Determination of the residues of BAS 500 F in barley and processed products

following treatment with BAS 500 01 F under field conditions in Germany 1999 - Follow up study
Institut Fresenius, Chemische und Biologische Laboratorien GmbH; Taunusstein; Germany Fed. Rep.
1999/11827

Seher A.-1999a-Soil adsorption/desorption study of 369315 (BF 500-7)
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/10684

Seher A.-1999b-Soil adsorption/desorption study of 364 380 (BF 500-6)
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/10686

Seher A.-1999c-Soil adsorption/desorption study of 340 266 (BF 500-3) on soils
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/10695

Staab G.-1998-Validation of analytical method . 415: Determination of BAS 500 F (parent) in tap and leachate water
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1998/11182

Staudenmaier H.-1999-Degradation of BAS 500 F in aerobic aquatic environment
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11241

Tilting N.-2000a-Investigation of residues of BAS 500 F (Reg. . 304428) in tissues and milk of dairy cows
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
2000/1000003

Tilting N.-2000b-Investigation of the stability of residues of BAS 500F (Reg. . 304428) in sample material of animal origin under usual storage conditions
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
2000/1017116

Tilting N., Lehmann W.-2000-Validation of analytical method 446 for the determination of BAS 500 F (Reg. . 304428) in sample material of animal origin
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11075

Tilting N., Knoell H.-E.-2000a-14C-Validation of method 446 for the determination of BAS 500 F (Reg. . 304428) and its metabolites in matrices of animal origin
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
2000/1000001

Tilting N., Knoell H.-E.-2000b-Interim report: Investigation of the stability of residues of BAS 500 F (Reg. . 304428) in sample materials of animal origin under usual storage conditions
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
2000/1000002

Tuerk W.-1996b-Determination of the octanol/water-partition coefficient of Reg. . 304 428 by HPLC
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1996/10383

Tuerk W.-1996c-Determination of the solubility of Reg. . 304 428 in water and buffer systems (pH4, pH7, pH9) at 20°C by column elution method and by HPLC
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1996/10939

Tuerk W.-1996d-Determination of the solubility of Reg. . 304 428 pure active ingredient (PAI) in organic solvents at 20°C
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1996/10954

Tuerk W.-1996e-Spectra of Reg. . 304 428 (PAI) (UV-, NMR-, IR- and mass spectrum)
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1996/10955

Tuerk W.-1996g-Determination of the appearance, the melting point and thermal conversions of Reg. . 304 428 (PAI)
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1996/10327

Tuerk W.-1996f-The determination of Reg. . 304 428 in technical grade active ingredient by HPLC
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1996/11507

Tuerk W.-1997-Validation of HPLC-method CP 266: Determination of Reg. . 304 428 in Reg. . 304 428 technical active ingredient (TAI) technical active ingredient (TAI)
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1997/10691

Veit P.-2000-Confined rotational crop study with ^{14C}-BAS 500 F -BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11829

Versoi P. *et al*.-1999a-The magnitude of BAS 500 F residues in red raspberries and highbush blueberries
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5143

Versoi P.L. *et al*.-1999b-Magnitude of BAS 500 F in wheat processed fractions and aspirated grain fraction

BASF Corporation Chemicals Division; Parsippany; United States of America
1999/5122

Versoi P. L. *et al*.-2000a-Magnitude of BAS 500 F residues in dry field peas
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5154

Versoi P.L. *et al*.-2000c-The magnitude of BAS 500 F residues in potatoes
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5148

Versoi P.L. *et al*.-2000c-The magnitude of BAS 500 F residues in bell and chili peppers
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5151

Versoi P.L. *et al*.-2000d-The magnitude of BAS 500 F residues in dry bulb and green onions
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5158

Versoi P.L. *et al*.-2000e-Magnitude of BAS 500 F residues in radishes
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5149

Versoi P.L. *et al*.-2000f-Magnitude of BAS 500 F Residues in Carrots
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5155

Versoi P.L. *et al*.-2000g-Magnitude of BAS 500 F residues in lentils
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5159

Versoi P.L. *et al*.-2000h-Magnitude of BAS 500 F residues in barley
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5079

Weeren R.D., Pelz S.-1999-Examination of the applicability of DFG method S 19 for the determination of BAS 500 F
Dr. Specht & Partner, Chemische Laboratorien GmbH; Hamburg; Germany Fed.Rep.
1999/10833

Wofford J. T. *et al*.-1999a-Magnitude of BAS 500 F residues in tomatoes
BASF Corporation Chemicals Division; Parsippany; United States of America
1999/5084

Wofford J. T. *et al*.-1999b-The magnitude of BAS 500 F residues in grape process fractions
BASF Corporation Chemicals Division; Parsippany; United States of America
1999/5011

Wofford J. T., Riley M.-1999c-Magnitude of BAS 500 F residues in peanuts
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5078

Wofford J.T *et al*.-1999d-Magnitude of BAS 500 F residues in bananas for import tolerance
BASF Corporation Chemicals Division; Parsippany; United States of America
1999/5095

Wofford J.T. *et al*.-1999e-Magnitude of BAS 500 F Residues in Peanuts
BASF Corporation Chemicals Division; Parsippany; United States of America
1999/5071

Wofford J.T. *et al*.-1999f-Magnitude of BAS 500 F Residue in Cucurbits
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5083

Wofford J.T. *et al*.-1999g Magnitude of BAS 500 F Residue in grapes
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5092

Wofford J.T. *et al*.-1999h-Magnitude of BAS 500 F Residue in grapes
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5010

Wofford J T. *et al*.-2000a-The magnitude of BAS 500 F residues in stonefruit
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5146

Wofford J.T. *et al*.-2000b-Magnitude of BAS 500 F residues in citrus
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
1999/5144

Wofford J.T. *et al*.-2000c- BAS 500 F use on a variety of crops plant/ animal residues chemistry overview
BASF Corporation Agricultural Products Center; Research Triangle Park, NC 27709; USA
2000/5111

Zangmeister W.-1999a-Validation of analytical method . 432: Determination of BAS 500 F, Reg. . 340 266, Reg. . 369 315 and Reg. . 364 380 in soil
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/10076

Zangmeister W.-1999b-Validation of analytical method 447: Determination of BAS 500 F (Reg. . 304428) in air by HPLC-UV
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/10694

Zangmeister W.-1999c-Validation of analytical method 455: Determination of BAS 500 F, BF 500-11, BF 500-12, BF 500-13, BF 500-14 and BF 500-15 residues in water (tap water and surface water)
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/10701

Zangmeister W.-1999d-Report amendment . 1 to final report: Validation of analytical method 432: Determination of BAS 500 F, Reg. . 340266, Reg. . 369315 and Reg. . 364380 in soil
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11095

Zangmeister W.-1999e-Report amendment . 1 to final report: Validation of analytical method 447: Determination of BAS 500 F (Reg. . 304428) in air by HPLC-UV
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1999/11104

Zangmeister W.-2000-Determination of BAS 500 F in water by HPLC/UV
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
2000/1000133

Ziegler G.-1998b-Validation of analytical method . 409: Determination of BAS 500 F (parent) in soil
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1998/10657

Ziegler G.-1998a-Soil adsorption/desorption study of 304 428 (BAS 500 F)
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1998/10650

Ziegler G.-1998c-Leaching behaviour of 14C-BAS 500 F after aerobic ageing for 30 days
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1998/11202

Ziegler G.-1998d-Leaching behaviour of 14C-BAS 500 F in four soils under laboratory conditions
BASF AG, Agrarzentrum Limburgerhof; Limburgerhof; Germany Fed.Rep.
1998/11350

Cross reference according to study numbers

1996/10327-Tuerk W.-1996g--
1996/10383-Tuerk W.-1996b--
1996/10939-Tuerk W.-1996c--
1996/10954-Tuerk W.-1996d--
1996/10955-Tuerk W.-1996e--
1996/11507-Tuerk W.-1996f--
1997/10646-Kaestel R.-1997
1997/10691-Tuerk W.-1997--
1998/10257-Scharf J.-1998a--
1998/10636-Leibold E. *et al*.-1998a--
1998/10637-Leibold E. *et al*.-1998b--
1998/10650-Ziegler G.-1998a--
1998/10657-Ziegler G.-1998b--
1998/10734-Loeffler U.-1998--
1998/10768-Kaestel R.-1998--
1998/10840-Scharf J.-1998b--
1998/10988-Hamm R.T.-1998--
1998/11182-Staab G.-1998--
1998/11201-Ebert D.-1998--
1998/11202-Ziegler G.-1998c--
1998/11350-Ziegler G.-1998d--
1999/10060-Scharf J.-1999a--
1999/10060-Scharf J.-1999a--
1999/10076-Zangmeister W.-1999a--
1999/10079-Kellner O.-1999a--
1999/10086-Scharf J.-1999b--
1999/10086-Scharf J.-1999b--
1999/10090-Ebert D.-1999a--
1999/10655-Reuschenbach P.-1999--
1999/10684-Seher A.-1999a--
1999/10686-Seher A.-1999b--
1999/10694-Zangmeister W.-1999b--
1999/10695-Seher A.-1999c--
1999/10701-Zangmeister W.-1999c--
1999/10833-Weeren R.D., Pelz S.-1999--
1999/10980-Meumann H. *et al*.---
1999/10981-Meumann H. *et al*.-1999b--
1999/10982-Meumann H. *et al*.-1999c--
1999/11075-Tilting N., Lehmann W.-2000--
1999/11079-Kampke-Thiel K.-1999-
1999/11091-Ebert D.-1999b--
1999/11093-Scharf J.-1999c--
1999/11095-Zangmeister W.-1999d--
1999/11103-Kellner O.-1999b--
1999/11104-Zangmeister W.-1999e--
1999/11134-Reinhard K., Mackenroth C.-1999a--
1999/11135-Reinhard K., Mackenroth C.-1999b--
1999/11137-Reinhard K.-1999e--
1999/11138-Reinhard K., Mackenroth C.-1999c--
1999/11241-Staudenmaier H.-1999--
1999/11286-Scharf J.-1999f--
1999/11286-Scharf J.-1999d--
1999/11288-Bayer H.-1999--
1999/11289-Ebert D.-1999c--

1999/11292-Kellner O.,Zangmeister W.-1999c--
1999/11300-Scharf J.-1999e--
1999/11301-Kellner O.,Zangmeister W.-1999d--
1999/11369-Levsen K.-1999--
1999/11419-Bross M., Mackenroth C.-1999--
1999/11480-Hafemann C., Knoell H.-E.-1999-
1999/11509-Beck J. *et al*.-1999a--
1999/11638-Schulz H.-1999--
1999/11700-Reinhard K., Mackenroth C.-1999d--
1999/11791-Ebert D.-1999d--
1999/11824-Beck J. *et al*.-1999b--
1999/11825-Meumann H. *et al*.-1999d--
1999/11826-Schulz H., Scharm M.-2000a--
1999/11827-Schulz H., Scharm M.-2000b--
1999/11829-Veit P.-2000--
1999/11895-Schat B., Beelen G.M.-1999--
1999/5010-Wofford J.T. *et al*.-1999h--
1999/5011-Wofford J. T. *et al*.-1999b--
1999/5064-Abdel-Baky S., Riley M.-1999-
1999/5071-Wofford J.T. *et al*.-1999e--
1999/5078-Wofford J. T., Riley M.-1999c--
1999/5079-Versoi P.L. *et al*.-2000h--
1999/5083-Wofford J.T. *et al*.-1999f--
1999/5084-Wofford J. T. *et al*.-1999a--
1999/5092-Wofford J.T. *et al*.-1999g --
1999/5095-Wofford J.T *et al*.-1999d--
1999/5107-Haughey D.. *et al*.-1999e--
1999/5122-Versoi P.L. *et al*.-1999b--
1999/5140-Haughey D. *et al*.-1999a--
1999/5143-Versoi P. *et al*.-1999a--
1999/5144-Wofford J.T. *et al*.-2000b--
1999/5146-Wofford J T. *et al*.-2000a--
1999/5148-Versoi P.L. *et al*.-2000c--
1999/5149-Versoi P.L. *et al*.-2000e--
1999/5150-Haughey D.. *et al*.-1999d--
1999/5151-Versoi P.L. *et al*.-2000c--
1999/5152-Haughey D. *et al*.1999c---
1999/5154-Versoi P. L. *et al*.-2000a--
1999/5155-Versoi P.L. *et al*.-2000f--
1999/5157-Haughey D. *et al*.-1999b--
1999/5158-Versoi P.L. *et al*.-2000d--
1999/5159-Versoi P.L. *et al*.-2000g--
1999/5161-Haughey D. *et al*.-2000--
1999/5179-Abdel-Baky S., Riley M.-2000b-
1999/5179-Abdel-Baky S., Riley M.-2000c-
1999/5184-Jordan J.-2000--
1999/5187-Perez R., Perez S.R.-2000--
2000/1000001-Tilting N., Knoell H.-E.-2000a-
2000/1000002-Tilting N., Knoell H.-E.-2000b-
2000/1000003-Tilting N.-2000a--
2000/1000004-Bross M., Tilting N.-2000--
2000/1000048-Bross M., Mackenroth C.-2000a--
2000/1000133-Zangmeister W.-2000--
2000/1000171-Ohnsorge U.-2000--
2000/1000201-Hamm R.T.-2000--
2000/1003597-Burkey J.D., Huntsinger D.-2000--
2000/1004148-Regenstein H.-2000--
2000/1013435-Bross M., Mackenroth C.-2000b--
2000/1017116-Tilting N.-2000b--
2000/5111-Wofford J.T. *et al*.-2000c--