METCONAZOLE (313)

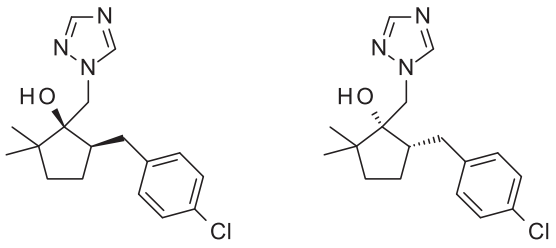
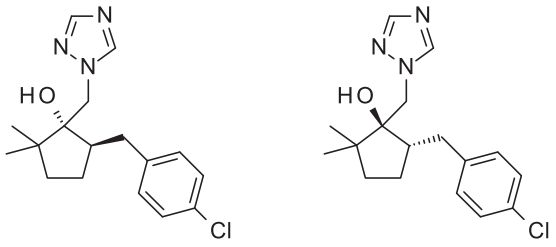
First draft prepared by Dr J Heidler, Federal Institute for Risk Assessment, Germany

EXPLANATION

Metconazole is a systemic triazole fungicide and plant growth regulator for the control of a broad range of important pathogens on a wide range of crops. It acts by inhibiting ergosterol biosynthesis. Metconazole was scheduled by the Fiftieth Session of the CCPR to be evaluated for the first time by the 2019 JMPR for toxicology and residues.

The Meeting received information on identity, physicochemical properties, metabolism (plant, confined rotational crops and animals), environmental fate, field rotational crops, methods of residue analysis, freezer storage stability, registered use patterns, supervised residue trials in stone fruit (plum, peach and cherry), blueberries, banana, onion, garlic, green bean, pulses (dry bean, pea and soya bean), potato, sugar beet, cereals (wheat, rye, oat, barley), maize, sweet corn, sugar cane, pecan nuts, almonds, oilseed rape, sunflower, cotton seed and peanut, fate of residues in processing, and livestock feeding studies.

IDENTITY

ISO common name	Metconazole
IUPAC name	(1*RS*,5*RS*;1*RS*,5*SR*)–5-(4-chlorobenzyl)–2,2-dimethyl–1-(1*H*–1,2,4-triazol–1-ylmethyl)cyclopentanol
CA nomenclature	5-[(4-chlorophenyl)methyl]–2,2-dimethyl–1-(1*H*–1,2,4-triazol–1-ylmethyl) cyclopentanol
Synonyms	BAS 555 F
CAS No.	125116–23–6
CIPAC No.	706
Structural formula	 cis-isomers Reg.no. 4079468  trans-isomers Reg.no. 4079654
Molecular formula	$C_{17}H_{22}ClN_3O$
Molecular mass	319.8 g/mol

Specifications

Specifications for metconazole were not yet developed by FAO.

PHYSICAL AND CHEMICAL PROPERTIES

Table 1 Physical and chemical properties of pure metconazole

Property	Results	Method (test material)	Reference
Melting point	100.0–108.4 °C	Guideline No. D–63–5 Batch 8879–140 B: purity 98.6 % (83% cis-isomer and 15.7% trans-isomer) (purified a.s.)	Mangels, 1995, METCON_001
Boiling point	Boiling point: 315 °C	OECD 103 ≈ EEC A2 Batch AC12140–17: 98.1% (purified a.s.)	Daum, 2004, METCON_002
Temperature of decomposition or sublimation	Not applicable (melting and boiling point were determined)		
Relative density	$D_4^{20} = 1.14$	EEC A3 Batch AC 8879–140B purified a.s.	Bashir, 1995, METCON_003
Vapour pressure	2.1×10^{-8} Pa at 20 °C (extrapolated from measurements at 85, 90, 95 and 100 °C, five replicates at each temperature but with one considered as outlier)	EEC A.4 Batch 8879–140 B: purity 98.6 % (83% cis-isomer and 15.7% trans-isomer) (purified a.s.)	Tremain & An, 2000, METCON_004
Henry´s Law Coefficient	2.21×10^{-7} Pa·m^3·mol^{-1} at 20 °C calculated with: - vapour pressure at 20 °C : 2.1×10^{-8} Pa and, - water solubility at 20 °C : 30.4 mg/L = 0.095 mol/m^3	Calculation Batch 8879–140 B : purity 98.6 % (83% cis-isomer and 15.7% trans-isomer) (purified a.s.)	Martin, 2002, METCON_005
Appearance	White powdered solid, odourless.	Batch AC 8879–140B : 98.6% (83% cis-isomer and 15.7% trans-isomer) (purified a.s.) 98.3% pure (84.2% of cis-isomer and 13.7% of trans-isomer) (lot AC 10575–61)	Kramer, 1996, METCON_006

<table>
<tr><th>Property</th><th>Results</th><th>Method
(test material)</th><th>Reference</th></tr>
<tr><td>Spectra</td><td>Following spectra were provided :
UV/VIS (spectra measured between 190–700 nm)
IR (KBr; sample scanned over range 4000 to 600 cm^{-1})
^{1}H-NMR (DMSO-d6)
^{13}C-NMR (DMSO-d6)
MS (both CI and EI)

The different spectra were found to be in agreement with the proposed chemical structures

<i>UV/VIS absorption characteristics :</i>

<table><tr><th></th><th>λ_{max} (nm)</th><th>ε ($L.mol^{-1}.cm^{-1}$)</th></tr><tr><td>Acetonitrile solution</td><td>196
221
226
(shoulder)
262
268</td><td>17700
5900
4600

150
190</td></tr></table>
at λ > 290 nm : 2 maxima (determined in pH 7 buffer containing 0.1% acetonitrile; 9.681 10^{-6} mol/L, 290 – 490 nm range cfr quantum yield study) :
at 310 nm : ε-value = 2686 $L.mol^{-1}.cm^{-1}$
at 372.5 nm : ε-value = 1921 $L.mol^{-1}.cm^{-1}$</td><td>a.s., 98.1% pure (80% cis, 20% trans) (lot AC 12140–17);
purified cis-isomer, 98.8% pure (lot AC 8879–136A);
purified trans-isomer , 98.6% pure (lot AC 9339–122A)</td><td>Jones, 2001, METCON_007

Kroehl, 2014, METCON_008</td></tr>
<tr><td>Solubility in water</td><td>Solubility at 20 °C in distilled Milli-Q water (pH ca. 7.5)
cis/trans mixture (AC 900768) : 30.4 mg/L
cis-isomers (CL 354801) : 17.1 mg/L
trans-isomers (CL 354802) : 13.6 mg/L

A preliminary test demonstrated that water solubility is not dependent on pH.</td><td>EEC A.6
98.6% (purified a.s.) (83% cis, 15.7% trans): batch AC8879–140B</td><td>Madsen, 1995a, METCON_009</td></tr>
<tr><td>Solubility in organic solvents</td><td>Solubility at 20 °C (g/L) :
<table><tr><th></th><th>AC 900768 (cis/trans)</th><th>CL 354801 (cis)</th><th>CL 354802 (trans)</th></tr><tr><td>hexane</td><td>1.40</td><td>0.929</td><td>0.483</td></tr><tr><td>toluene</td><td>103</td><td>66.2</td><td>38</td></tr><tr><td>dichloromethane</td><td>481</td><td>343</td><td>141</td></tr><tr><td>methanol</td><td>403</td><td>291</td><td>117</td></tr><tr><td>2-propanol</td><td>132</td><td>86.6</td><td>46.7</td></tr><tr><td>acetone</td><td>363</td><td>251</td><td>117</td></tr><tr><td>ethyl acetate</td><td>260</td><td>173</td><td>90.0</td></tr></table></td><td>EEC A.6
98.6% (purified a.s.) (83% cis, 15.7% trans): batch AC8879–140B</td><td>Madsen, 1995a, METCON_009</td></tr>
<tr><td>Partition coefficient n-octanol / water</td><td><table><tr><th></th><th>AC 900768 (cis/trans)</th><th>CL 354801 (cis)</th><th>CL 354802 (trans)</th></tr><tr><td>log P_{ow} at 20 °C</td><td>3.85</td><td>3.85</td><td>3.8</td></tr></table>
Test water: distilled Milli-Q water (pH 7.2-8)</td><td>EEC A8
98.6% (purified a.s.) (83% cis, 15.7% trans): batch AC8879–140B</td><td>Madsen, 1996b, METCON_010</td></tr>
<tr><td>Hydrolysis</td><td>Metconazole was stable (less than 10% loss after 120 hours) for all pH values tested (4, 7, 9) at 50 °C.</td><td>EEC C7
95.3% (purified a.s. (79.8% cis, 15.5% trans): batch 89-01</td><td>Fisk, 1991, METCON_011</td></tr>
</table>

Property	Results	Method (test material)	Reference
Photolysis	Aqueous metconazole solutions were continuously irradiated for 30 days at 50 °C. Half-life values were: DT_{50} at pH 5: 28 days DT_{50} at pH 7: 36 days DT_{50} at pH 9: 36 days Hydroxy metconazole was detected at >10% AR	US-EPA, FIFRA 40 CFR part 158, Subdivision N Series 161–2 94.46% (chemical purity)	Williams & Heim, 1996, METCON_012
	It was demonstrated that metconazole is stable in water at pH 7 after continuous irradiation for up to 15 days. The amount of metconazole present was in the range 92.6–97.6% AR throughout the irradiation period. The ratio of isomers remained stable during the course of the study.	OECD 316 Phenyl label: chemical purity 92.7% (cis/trans ratio 81.4:18.6), Batch No. 1065–1029 Triazole-label: chemical purity 92.5% cis/trans ratio 82:18), Batch No. 811–1101	Knight, 2015, METCON_013
Quantum yield of direct photo-transformation	Quantum yield: $2.19e^{-7}$	OECD GD on direct phototransformation 1997 92.2% (chemical purity), batch AC 12041–24	Knoch & Martin, 1999, METCON_014
Lifetime in the top layer of aqueous systems (calculated and real)	pH 5: DT_{50} = 27.5 d pH 7: DT_{50} = 36.3 d pH 9: DT_{50} = 35.8 d	US-EPA, FIFRA 40 CFR part 158, Subdivision N Series 161–2 94.46% (chemical purity)	Williams & Heim, 1996, METCON_015
Dissociation in water of purified active substance	pKa1 = 11.38 +- 0.03 pKa2 = 1.06 +- 0.03	OECD 112 98.6% (chemical purity): batch AC8879–140B	Madsen & Barton, 1995, METCON_016
Estimated photochemical oxidative degradation	K_{OH} =19.6914 e -12 cm^3/molecules*sec Tropospheric half-life: 6.5 hours		Mangels, 1996, METCON_017
Surface tension	48.6 mN/m at 20 °C (90% saturated solution in pure water) The pure active ingredient metconazole was found to be a surface active material.	OECD Guideline 115, EEC A5 (Plate method) COD-001163 98.7 % (cis/trans ratio not reported)	Daum, 2015, METCON_021
Oxidizing properties	max. burning rate of reference mixtures = 2.63 mm/s (barium nitrate/cellulose 60/40 % w/w); combustion through the whole pile max. burning rate of test mixtures = 1.82 mm/s (test substance/cellulose 10/90 % w/w); combustion at the surface of the pile only ⇒ a.s. does not present oxidizing properties	EEC A17 96% purity (a.s. as manufactured, batch ST89/088)	van Helvoirt, 1990d, METCON_022
pH	pH: 5.81 (1% dispersion in distilled water)	Equivalent to CIPAC MT 75 Batch AC10575–61, 98.4 %	Yacoub, 2006, METCON_023
Storage stability	Metconazole was found stable at normal and elevated temperature.	OPPTS 830.6313, determination by DSC Batch AC10575–61, 98.4 %	Yacoub, 2006, METCON_023
	Metconazole is stable after storage for 14 days at 54 °C.	OPPTS 830.6313, determination by GC Batch AC10575–61, 98.4 %	Morrissey, *et al*., 1998 METCON_024

Formulations

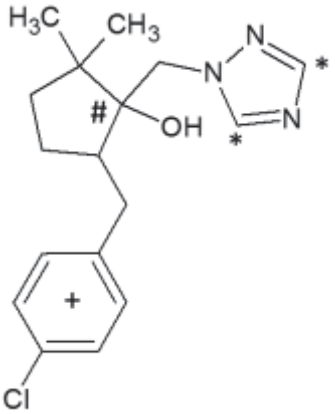
Metconazole is applied formulated alone or in combination with other active substances. It is formulated as emulsifiable concentrate (EC), soluble (liquid) concentrate (SL), water dispersible granules (WG), suspension concentrate (SC) and suspo-emulsion (SE) products.

Table 2 Examples of formulations registered containing metconazole as active ingredient

Formulation type	EC	EC/ SL	WG	SC	SL	EC	SC	EC	EC	EC	SC	EC
Metconazole	60 g/L	90 g/L	50%	479 g/L	30 g/L	80 g/L	55 g/L	27.5 g/L	25 g/L	41.3 g/L	60 g/L	45 g/L
Mepiquat-Chloride					210 g/L							
Pyraclostrobin						130 g/L	146 g/L					
Epoxiconazole								37.5 g/L	37.5 g/L	56.3 g/L		
Boscalid											133 g/L	
Fluxapyroxad												62.5 g/L

METABOLISM AND ENVIRONMENTAL FATE

Metabolism studies were conducted using either [triazole–^{14}C]- or [cyclopentyl-^{14}C]- or [p-chlorophenyl-^{14}C]-metconazole. The position of the label for the test substances is presented in the following figure:

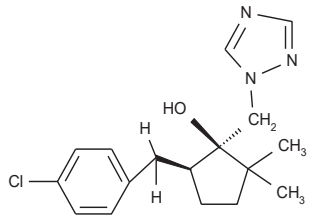
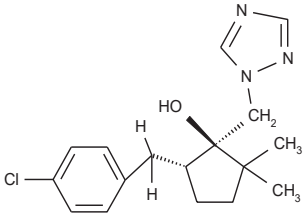
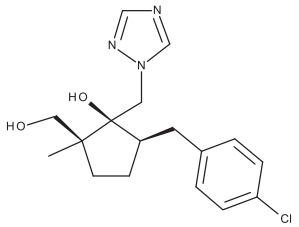
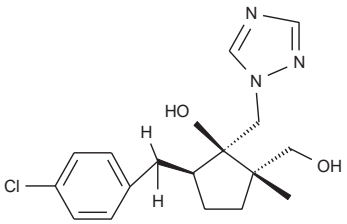
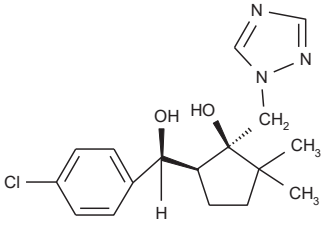
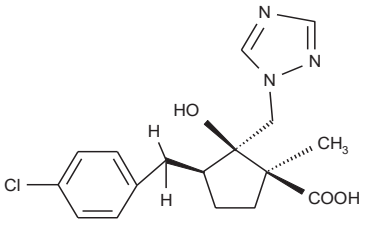


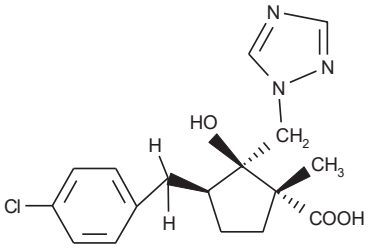
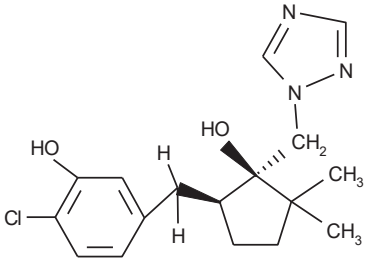
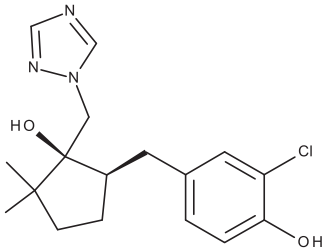
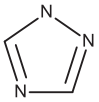
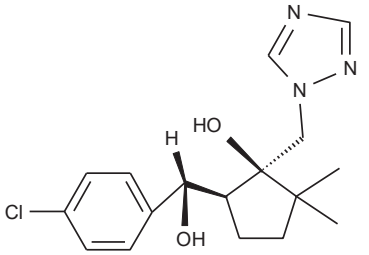
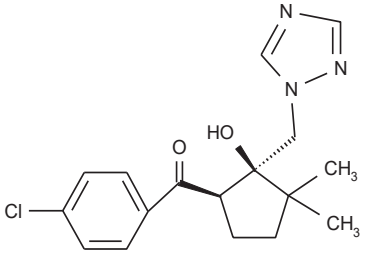
* [triazole-^{14}C]-metconazole
\# [cyclopentyl-^{14}C]-metconazole
\+ [p-chlorophenyl-^{14}C]-metconazole

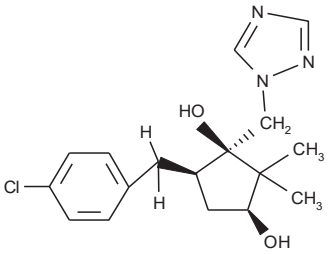
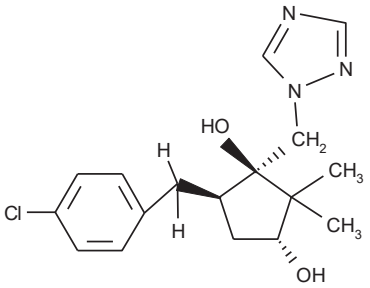
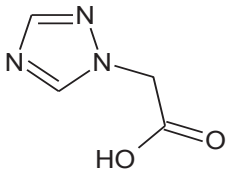
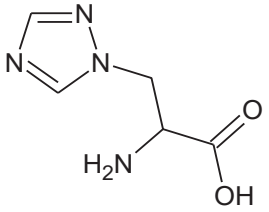
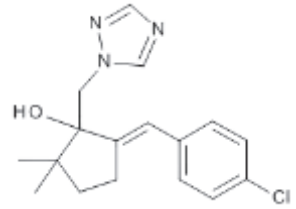
Figure 1 Structure of metconazole and position of radiolabels

Chemical names, structures and code names of metabolites and degradation products of metconazole are shown below.

Table 3 Known metabolites of metconazole

Code Names	Chemical Names (IUPAC)	Structure	Where found
M0 CL 900768 WL148271 KNF-S–474m *cis*-isomer: CL 354801; WL136184 KNF-S–474c *trans*-isomer: CL 354802; WL153996 (KNF-S–474t)	(1*RS*,5*RS*;1*RS*,5*SR*)–5-(4-chlorobenzyl)–2,2-dimethyl–1-(1*H*–1,2,4-triazol–1-ylmethyl)cyclopentanol	 Cis-isomer  Trans-isomer Molar mass: 319.8 g/mol	Plants (wheat, canola, banana, mandarin, pea) Animals (goat, hen)
M1 CL 359451	(1SR,2SR,5RS)–5-(4-chlorobenzyl)–2-(hydroxymethyl)–2-methyl–1-(1H–1,2,4-triazol–1-ylmethyl)cyclopentanol	 Molar mass: 335.8 g/mol	Plants (banana, mandarin) Animals (goat, hen)
M2 CL 359452	(1SR,2RS,5RS)–5-(4-chlorobenzyl)–2-(hydroxymethyl)–2-methyl–1-(1H–1,2,4-triazol–1-ylmethyl)cyclopentanol		Plants (wheat, mandarin) Animals (goat)
M11 CL 382390	(1RS,5SR)5-[(SR)-(4-chlorophenyl)(hydroxy)methyl]–2,2-dimethyl–1-(1H–1,2,4-triazol–1-ylmethyl)cyclopentanol		Plants (wheat, canola banana)
M12 (4543815) CL 359138	(1RS,2SR,3RS)–3-(4-chlorobenzyl)–2-hydroxy–1-methyl–2-(1H–1,2,4-triazol–1-ylmethyl)cyclopentanecarboxylic acid		Animals (goat, hen) Rotational crops (radish)

Code Names	Chemical Names (IUPAC)	Structure	Where found
		Molar mass: 349.8 g/mol	
M13 (4543816) CL 359139	(1SR,2SR,3RS)–3-(4-chlorobenzyl)–2-hydroxy–1-methyl–2-(1H–1,2,4-triazol–1-ylmethyl)cyclopentanecarboxylic acid		Animals (goat)
M15 CL 359453	(1RS,5SR)–5-(4-chloro–3-hydroxybenzyl)–2,2-dimethyl–1-(1H–1,2,4-triazol–1-ylmethyl)cyclopentanol		Animals (goat)
M19 (4111113) CL 395838	(1RS,5SR)–5-(3-chloro–4-hydroxybenzyl)–2,2-dimethyl–1-(1H–1,2,4-triazol–1-ylmethyl)cyclopentanol		Animals (goat)
M20 87084 M555F020	1,2,4-(1H)-triazole		Animals (hen) Environment (soil)
M21 CL 197130	(1RS,5SR)–5-[(RS)-(4-chlorophenyl)(hydroxy)methyl]–2,2-dimethyl–1-(1H–1,2,4-triazol–1-ylmethyl)cyclopentanol		Plants (wheat, mandarin)
M30 4110625 CL 382389 M555F030cis	(1RS,5SR)–5-(4-chlorobenzoyl)–2,2-dimethyl–1-(1H–1,2,4-triazol–1-ylmethyl)cyclopentanol		Plants (wheat) Environment (soil) Rotational crops (radish, wheat straw)

Code Names	Chemical Names (IUPAC)	Structure	Where found
M31 5968488	(1RS,3SR,5RS)–5-(4-chlorobenzyl)–2,2-dimethyl–1-(1H–1,2,4-triazol–1-ylmethyl)cyclopentane–1,3-diol		Animals (goat, hen)
M32 5968479	(1RS,3RS,5RS)–5-(4-chlorobenzyl)–2,2-dimethyl–1-(1H–1,2,4-triazol–1-ylmethyl)cyclopentane–1,3-diol		Animals (goat, hen)
M34 Triazolyl acetic acid WL 161417	2-(1,2,4-triazol–1-yl)acetic acid		Plants (wheat) Rotational crops (wheat grain)
M35 Triazolyl alanine WL161416 CL 147267	2-amino–3-(1H–1,2,4-triazol–5-yl)propanoic acid		Plants (wheat, canola, pea) Rotational crops (radish, lettuce, wheat grain)
M40 M555F040	(5Z)–5-(4-chlorobenzylidene)–2,2-dimethyl–1-(1H–1,2,4-triazol–1-ylmethyl)cyclopentanol		Environment (soil)

PLANT METABOLISM

The metabolic fate in plants was investigated following foliar application of [triazole-^{14}C]-metconazole to wheat, canola, banana, mandarins and peas; [cyclopentyl–^{14}C]-metconazole to wheat and mandarin and [*p*-chlorophenyl-^{14}C]-metconazole to banana, canola and pea.

In all studies metconazole was moderately degraded into its mono- or dihydroxylated metabolites or their respective glucoside conjugates. Parent metconazole was the major identified component in all matrices, except in wheat grain and pea seed treated with [triazole-^{14}C]-metconazole. In these matrices triazolyl alanine (wheat grain and pea seed) and triazolyl acetic acid (wheat grain) were identified as the major identified components.

Mandarins

A metabolism study with mandarins (variety Wase Unshu) under greenhouse conditions was performed with [cyclopentyl-^{14}C]- and [triazole–^{14}C]-radiolabelled metconazole (Satoh, 2002, Metcon_031), each containing a *cis*:*trans* ratio of 85:15. Mandarin plants received a single foliar application at rates of 0.2 kg ai/ha (1×) per radiolabel at the fruit stage (about 2 months before maturity). Fruit and leaf samples were taken at 0 (immediately after the treatment), 28 and 56 DAT and rinsed with methanol. Additionally, fruits were separated in peel and pulp.

The rinsed sample material was homogenized and extracted with methanol/water (7:3, v/v) for peel and pulp, and methanol/water (1:1, v/v) for leaves, followed by the determination of the radioactivity using LSC. The TRR in sample material was calculated as the sum of total radioactivity in the surface rinse, extracts and post extraction solids. Further characterization was done by fractionation of the extracts using SPE on a C18 cartridge. Aliquots of the methanol fractions obtained from SPE fractionation of peel and leaf extracts (56 DAT, both labels) were subjected to acidic hydrolysis (0.1 M HCL at 100 °C for 1 day) or incubated with cellulase (37 °C for 1 day) to liberate conjugates. HPLC and TLC, against reference compounds, were applied for the identification of the radioactivity in the rinse and sample extracts, but not for pulp samples, as the radioactivity was too low.

Table 4 shows similar TRR levels for both labels with the radioactivity found in mandarin leaves 10 times higher compared to fruit.

Table 4 Total radioactive residues in mandarins after one foliar application of [cyclopentyl–^{14}C]- and [triazole–^{14}C]-radiolabelled metconazole

Matrix	Sampling interval DAT	TRR [a] (mg eq/kg) [cyclopentyl–^{14}C]-metconazole	[triazole–^{14}C]-metconazole
Leaf	0	4.2	4.8
	28	3.5	3.7
	56	3.1	3.3
Fruit	0	0.10	0.13
	28	0.097	0.099
	56	0.11	0.072

[a] Calculated as the sum of surface rinse, peel extract and RRR, flesh extract and RRR

The radioactivity extracted from homogenized mandarin fruit and leaf samples is presented in Tables 5 and 6. Extracted radioactivity ranged between 93–100% TRR and 90–99% TRR in mandarin fruits and leaves, respectively.

Table 5 Extractability of radioactive residues from mandarin fruit samples after one foliar application of [cyclopentyl–^{14}C]- and [triazole–^{14}C]-radiolabelled metconazole

DAT	TRR (mg eq/kg)	Surface rinse mg eq/kg (% TRR)	Peel Extract mg eq/kg (% TRR)	Peel PES mg eq/kg (% TRR)	Flesh Extract mg eq/kg (% TRR)	Flesh PES mg eq/kg (% TRR)	Sum ERR mg eq/kg (% TRR)	Sum PES mg eq/kg (% TRR)
[triazole–^{14}C]-metconazole								
0	0.13	0.101 (84)	0.019 (15)	< 0.001 (0.7)	< 0.001 (0.3)	< 0.001 (< 0.1)	0.13 (99)	0.002 (0.8)
28	0.10	0.018 (18)	0.074 (75)	0.005 (5.2)	0.002 (1.9)	< 0.001 (< 0.1)	0.094 (95)	0.006 (5.3)
56	0.072	0.011 (15)	0.054 (76)	0.004 (6.0)	0.002 (3.0)	< 0.001 (< 0.1)	0.067 (94)	0.005 (6.1)
[cyclopentyl–^{14}C]-metconazole								
0	0.10	0.084 (82)	0.018 (18)	< 0.001 (0.6)	< 0.001 (0.2)	< 0.001 (< 0.1)	0.10 (100)	0.002 (0.7)
28	0.097	0.020 (20)	0.072 (74)	0.005 (4.9)	0.001 (1.3)	< 0.001 (0.2)	0.093 (95)	0.006 (5.1)
56	0.11	0.013 (12)	0.090 (80)	0.008 (6.7)	0.002 (1.5)	< 0.001 (0.1)	0.10 (93)	0.009 (6.8)

Table 6 Extractability of radioactive residues from mandarin leaf samples after one foliar application of [cyclopentyl–^{14}C]- and [triazole–^{14}C]-radiolabelled metconazole

DAT	TRR	Surface rinse		Extract		Sum ERR		PES	
	mg eq/kg	mg eq/kg	%TRR	mg eq/kg	%TRR	mg eq/kg	%TRR	mg eq/kg	%TRR
[triazole–^{14}C]-metconazole									
0	4.8	4.0	82	0.83	17	4.8	99	0.041	0.9
28	3.7	2.0	56	1.3	36	3.4	92	0.30	8.3
56	3.3	1.3	39	1.7	51	3.0	90	0.32	9.6
[cyclopentyl–^{14}C]-metconazole									
0	4.2	3.4	80	0.80	19	4.2	99	0.034	0.8
28	3.5	1.8	51	1.5	43	3.3	94	0.18	5.0
56	3.1	1.4	46	1.5	47	2.9	93	0.21	6.8

The distribution of radioactivity in mandarin fruits and leaves is presented in Table 7 and Table 8 Further analyses of the flesh extracts were not conducted due to their low radioactivity. Parent metconazole was a major identified residue all matrices accounting for 47–94% TRR (0.34–0.12 mg eq/kg) in fruit and 45–95% TRR (1.5–4.6 mg eq/kg) in leaves. As a minor metabolite, M21 was identified in fruits and leaves at levels of up to 1.8% TRR (0.002 mg eq/kg) and 2.7% TRR (0.083 mg eq/kg), respectively. Acidic hydrolysis experiments demonstrated that conjugates were cleaved to form four aglycones of which two could be assigned to M1 at up to 3.0% TRR in peels and M2 at up to 1.9% TRR in peels. The proposed metabolic pathway of metconazole is shown in Figure .

Table 5 Summary of identified/characterized residues in mandarin fruit after one foliar application of [cyclopentyl–^{14}C]- and [triazole–^{14}C]-radiolabelled metconazole

Fraction	Fruits					
	0 DAT		28 DAT		56 DAT	
	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]
[triazole–^{14}C]-metconazole						
TRR	0.13	100	0.10	100	0.072	100
Sum of surface rinse and peel extract (SPE organic eluate)	0.13	99	0.094	95	0.067	94
Metconazole	0.12	92	0.054	54	0.034	47
M1[b]	-	-	-	-	0.002	3.0
M2[b]	-	-	-	-	0.001	1.9
M21 (plus at least one unknown)	n/d		0.002	1.8	0.001	1.7
Aglycons of hydroxylated metconazole metabolites	-	-	-	-	0.008	11
Others[a]	0.009	7.1	0.032	33	0.016	21
Peel extract (SPE water eluate)	< 0.001	< 0.1	0.003	2.9	0.003	4.5
Flesh extract	< 0.001	0.3	0.002	1.9	0.002	3.0
Total identified	**0.12**	**92**	**0.056**	**56**	**0.038**	**54**
Total characterized	**0.009**	**7.4**	**0.037**	**38**	**0.029**	**39**
Unextracted	**0.002**	**0.8**	**0.006**	**5.3**	**0.005**	**6.1**
Total	0.13	100	0.10	99	0.072	99
[cyclopentyl–^{14}C]-metconazole						
TRR	0.10	100	0.097	100	0.11	100
Sum of surface rinse and peel extract (SPE organic eluate)	0.10	100	0.093	95	0.10	93
Metconazole	0.097	94	0.053	54	0.055	49
M1[b]	-	-	-	-	0.003	3.0
M2[b]	-	-	-	-	0.002	1.8
M21 (plus at least one unknown)	n/d		0.002	1.7	0.002	1.6
Aglycons of hydroxylated metconazole metabolites	-	-	-	-	0.012	12
Others[a]	0.006	5.8	0.034	36	0.027	22
Peel extract (SPE water eluate)	< 0.001	0.2	0.002	1.8	0.003	2.4
Flesh extract	< 0.001	0.2	0.001	1.3	0.002	1.5
Total identified	**0.097**	**94**	**0.055**	**56**	**0.062**	**55**

Fraction	Fruits 0 DAT [mg/kg]	[% TRR]	28 DAT [mg/kg]	[% TRR]	56 DAT [mg/kg]	[% TRR]
Total characterized	**0.008**	**6.2**	**0.037**	**39**	**0.043**	**38**
Unextracted	**0.002**	**0.7**	**0.006**	**5.1**	**0.009**	**6.8**
Total	**0.11**	**101**	**0.098**	**100**	**0.11**	**100**

[a] Including isomers of hydroxylated metconazole as well as conjugates

[b] After acidic hydrolysis

Table 8 Summary of identified/characterized residues in mandarin leaf samples after one foliar application of [cyclopentyl–^{14}C]- and [triazole–^{14}C]-radiolabelled metconazole

Designation	Leaves 0 DAT [mg/kg]	[% TRR]	28 DAT [mg/kg]	[% TRR]	56 DAT [mg/kg]	[% TRR]
[triazole–^{14}C]-metconazole						
TRR	**4.8**	**100**	**3.7**	**100**	**3.3**	**100**
Sum of surface rinse and extract (SPE organic eluate)	4.8	99	3.4	92	3.0	90
Metconazole	4.6	95	2.0	54	1.5	45
M1[b]	-	-	-	-	0.050	1.4
M2[b]	-	-	-	-	0.025	0.69
M21 (plus at least one unknown)	0.019	0.39	0.083	2.3	0.075	2.3
Aglycons of hydroxylated metconazole metabolites	-	-	-	-	0.172	4.8
Others[a]	0.28	5.7	1.2	33	1.0	32
Extract (SPE water eluate)	0.006	0.1	0.14	3.8	0.22	6.7
Total identified	**4.6**	**95**	**2.1**	**56**	**1.6**	**47**
Total characterized	**0.29**	**5.8**	**1.3**	**37**	**1.4**	**44**
Unextracted	**0.041**	**0.9**	**0.30**	**8.3**	**0.316**	**9.6**
Total	**4.9**	**102**	**3.7**	**101**	**3.3**	**101**
[cyclopentyl–^{14}C]-metconazole						
TRR	**4.2**	**100**	**3.5**	**100**	**3.1**	**100**
Sum of surface rinse and extract (SPE organic eluate)	4.2	99	3.3	94	2.9	93
Metconazole	3.9	93	2.0	57	1.5	48
M1[b]	-	-	-	-	0.056	1.4
M2[b]	-	-	-	-	0.034	0.82
M21 (plus at least one unknown)	n/d		0.083	2.4	0.082	2.7
Aglycons of hydroxylated metconazole metabolites	-	-	-	-	0.18	4.3
Others[a]	0.29	6.9	1.2	33	0.92	30
Extract (SPE water eluate)	0.005	0.1	0.11	3.2	0.14	4.4
Total identified	**3.9**	**93**	**2.1**	**59**	**1.7**	**53**
Total characterized	**0.30**	**7.0**	**1.3**	**36**	**1.2**	**40**
Unextracted	**0.034**	**0.8**	**0.18**	**5.0**	**0.21**	**6.8**
Total	**4.3**	**101**	**3.5**	**100**	**3.1**	**100**

[a] Including isomers of hydroxylated metconazole as well as conjugates

[b] After acidic hydrolysis

Banana

A metabolism study with banana (variety Dwarf Cavendish) under greenhouse conditions was performed with [triazole–^{14}C]- and [*p*-chlorophenyl–^{14}C]-radiolabelled metconazole, each containing a *cis*:*trans* ratio of about 80:20 (Kao, 1998, Metcon_030). Banana plants received five foliar applications at a rate of 0.14 kg ai/ha per application and radiolabel. The first treatment occurred at the flowering stage and every two weeks after the initial application. Banana fruits were sampled at 56 DAT1 (2 h after the last treatment, 0 DALA) and a subsample separated into peel and pulp.

The TRR in the homogenized sample material was determined by combustion followed by LSC. TRR in extracts was directly determined by LSC. To characterize and identify the radioactivity present, fruit samples were extracted three times with methanol, followed by 2% HCl in methanol. HPLC against reference compounds and LC-MS were applied for the identification of the radioactivity.

Table 9 shows similar TRR levels for both labels with the highest radioactivity found in banana peel. Levels in the pulp were about three times lower.

Table 9 Total radioactive residues in banana fruit after five foliar applications of [triazole–^{14}C]- and [*p*-chlorophenyl–^{14}C]-metconazole

Sampling interval DAT1 (DALA)	Matrix	TRR determined by direct combustion, mg eq/kg	
		[triazole–^{14}C]-metconazole	[*p*-chlorophenyl–^{14}C]-metconazole
56 (0)	Fruit	1.4	0.93
	Peel	1.6	2.5
	Pulp	0.61	0.78

The radioactivity extracted from homogenized banana matrices with methanol and 2%HCl in methanol is presented in Table 10. Extracted radioactivity ranged between 96–98% TRR from all matrices. The PES radioactivity ranged between 1.7–3.6%TRR.

Table 10 Extractability of radioactive residues from banana matrices after five foliar applications of [triazole–^{14}C]- and [*p*-chlorophenyl–^{14}C]-metconazole, sampled at 0 DALA

Fraction	Radioactive residues in mg eq/kg (% TRR)					
	[triazole–^{14}C]-metconazole			[*p*-chlorophenyl–^{14}C]-metconazole		
	Fruit	Peel	Pulp	Fruit	Peel	Pulp
TRR	**1.4 (100)**	**1.6 (100)**	**0.61 (100)**	**0.93 (100)**	**2.5 (100)**	**0.78 (100)**
Methanol extracts	1.3 (93)	1.5 (94)	0.54 (89)	0.85 (92)	2.4 (93)	0.67 (86)
2%HCl/MeOH extract	0.05 (3.4)	0.05 (2.9)	0.06 (9.0)	0.04 (4.7)	0.09 (3.4)	0.09 (12)
ERR[a]	**1.35 (96)**	**1.55 (97)**	**0.60 (98)**	**0.89 (97)**	**2.4 (96)**	**0.76 (98)**
Unextracted	**0.05 (3.6)**	**0.05 (3.4)**	**0.011 (1.8)**	**0.031 (3.4)**	**0.086 (3.4)**	**0.013 (1.7)**
Total	**1.4 (100)**	**1.6 (100)**	**0.61 (100)**	**0.93 (100)**	**2.5 (100)**	**0.77 (99)**

[a] Extracted radioactive residues

The distribution of radioactivity is presented in Table . Parent metconazole was a major identified residue all matrices accounting for 86–89% TRR (0.52–2.2 mg eq/kg). As minor metabolites, M1 and M11 were identified at levels of 0.87–2.3% TRR (0.009–0.022 mg eq/kg) and 1.3–2.1% TRR (0.010–0.040 mg eq/kg), respectively. Additionally, triazolyl alanine was identified in [triazole–^{14}C]-metconazole treated bananas, accounting for 0.64–3.5% TRR (0.010–0.021 mg eq/kg). The proposed metabolic pathway of metconazole is shown in Figure .

Table 11 Summary of identified/characterized residues in banana matrices after five foliar applications of [triazole–^{14}C]- and [*p*-chlorophenyl–^{14}C]-metconazole

Fraction	Radioactive residues in mg eq/kg (% TRR)					
	[triazole–^{14}C]-metconazole			[*p*-chlorophenyl–^{14}C]-metconazole		
	Fruit	Peel	Pulp	Fruit	Peel	Pulp
TRR	1.4 (100)	1.6 (100)	0.61 (100)	0.93 (100)	2.5 (100)	0.78 (100)
Extracts	**1.35 (96)**	**1.55 (97)**	**0.60 (98)**	**0.89 (97)**	**2.4 (96)**	**0.76 (98)**
Metconazole	1.2 (87)	1.4 (87)	0.52 (86)	0.80 (86)	2.2 (87)	0.70 (89)
Triazolyl alanine	0.017 (1.2)	0.010 (0.64)	0.021 (3.5)	n/a	n/a	n/a
M1 (CL 359451)	0.017 (1.2)	0.014 (0.87)	0.014 (2.3)	0.009 (0.96)	0.022 (0.87)	0.014 (1.7)
M11 (CL 382390)	0.017 (1.3)	0.023 (1.4)	0.010 (1.7)	0.016 (1.7)	0.040 (1.6)	0.016 (2.1)
Characterized by	0.076 (5.5)	0.11 (6.8)	0.018 (2.9)	0.060 (6.4)	0.19 (7.4)	0.037 (5.6)

Fraction	Radioactive residues in mg eq/kg (% TRR) [triazole–^{14}C]-metconazole			[*p*-chlorophenyl–^{14}C]-metconazole		
	Fruit	Peel	Pulp	Fruit	Peel	Pulp
HPLC						
Total identified	**1.3 (90)**	**1.4 (90)**	**0.57 (94)**	**0.83 (89)**	**2.2 (89)**	**0.71 (91)**
Total characterized	**0.076 (5.5)**	**0.11 (6.8)**	**0.018 (2.9)**	**0.060 (6.4)**	**0.19 (7.4)**	**0.044 (4.8)**
Unextracted	**0.05 (3.6)**	**0.05 (3.4)**	**0.011 (1.8)**	**0.031 (3.4)**	**0.086 (3.4)**	**0.013 (1.7)**
Total	**1.4 (99)**	**1.6 (100)**	**0.60 (99)**	**0.92 (99)**	**2.5 (100)**	**0.77 (98)**

Peas

A metabolism study with peas (variety Kleine Rheinländerin) under field conditions was performed with [*p*-chlorophenyl–^{14}C]- and [triazole–^{14}C]-radiolabelled metconazole (Class & Schluter, 2002, Metcon_032). Plants received two foliar application (green pea scenario) and a third foliar application (dry pea scenario) at a rate of 0.22 kg ai/ha per application and radiolabel with a spray interval of 13–14 days. Foliage samples were taken at 0 DAT1, 0 DAT 2 (13 DAT1) and 0 DALA (27 DAT1). For the green pea scenario, peas and straw were harvested at 13 DAT 2 (26 DAT1) at BBCH 79 and for the dry pea scenario at 15 DALA (42 DAT1) at BBCH 89. The seeds were separated from the pods and the empty pods and the straw combined.

The TRR in the homogenized sample material was determined by combustion followed by LSC. TRR in extracts was directly determined by LSC. Prior to homogenization, all samples except pea seeds were surface extracted by submersion in acetone/water (7:3). All samples were homogenized with acetone, followed by an additional extraction with acetone/methanol/water (1:1:1) for forage 0 DAT1 and DAT 2, and with methanol/water (4:1), followed by water for forage at 0 DALA, straw and seeds. To liberate conjugates, aliquots of the straw extracts (15 DALA) were subjected to acidic hydrolysis (1 M HCl, refluxed for 5 h) and additionally incubated with β-glucosidase. Post extraction solids of pea straw samples from 13 DAT2 and 15 DALA were sequentially treated with 0.1 M HCl, refluxing with acetonitrile/1 mol/L HCl (9:1) and refluxing with 6 M HCl. Additionally, subsamples of pea straw PES (15 DALA) was suspended in a mixture of water and methanol (350/2.5, v/v) to extract water soluble polysaccharides and proteins, followed by solubilisation of pectin by sodium ethylene-diamino-tetra acid solution (Na2-EDTA) or pectinase, solubilisation of lignin with DMSO and solubilisation of cellulose with Schweizer's reagent (saturated solution of copper hydroxide in concentrated ammonium hydroxide. HPLC against reference compounds, TLC and LC-MS/MS were applied for the identification of the radioactivity.

TRR levels in pea matrices are shown in Table . Except for pea seeds, the radioactivity was similar in all matrices for both radiolabels with the highest level in straw at 15 DALA. In seeds the radioactivity was generally lower compared to the other matrices and differed significantly between labels ranging between 0.038–0.23 mg eq/kg and 1.6–3.9 mg eq/kg for the [*p*-chlorophenyl–^{14}C]- and [triazole–^{14}C]-label, respectively.

Table 12 Total radioactive residues in pea after two or three foliar application of [*p*-chlorophenyl–^{14}C]- and [triazole–^{14}C]-radiolabelled metconazole

Sampling interval DAT1	Matrix	TRR measured [a] [mg eq/kg]	TRR calculated [b] [mg/kg]
[triazole–^{14}C]-metconazole			
0	Foliage	9.6	11
13 (0 DAT 2)		5.4	8.7
27 (0 DALA)		21	11
26 (13 DAT 2, green pea scenario)	Straw	10	12
	Seed	1.6	1.6
42 (15 DALA, dry pea scenario)	Straw	63	49
	Seed	3.9	3.7
[*p*-chlorophenyl–^{14}C]-metconazole			
0	Foliage	5.1	8.8
13 (0 DAT 2)		13	6.1

Sampling interval DAT1	Matrix	TRR measured [a] [mg eq/kg]	TRR calculated [b] [mg/kg]
27 (0 DALA)		21	8.4
26 (13 DAT 2, green pea scenario)	Straw	9.9	7.9
	Seed	0.038	0.044
42 (15 DALA, dry pea scenario)	Straw	168	60
	Seed	0.23	0.20

[a] Determined by direct combustion analysis

[b] Calculated as the sum of ERR and RRR

The radioactivity found in the fractions from solvent extractions and in the unextracted remainder is presented in Table 13 Extractability of radioactive residues from foliage, straw and seed ranged between 85–100% TTR.

Table 13 Extractability of radioactive residues in pea after two or three foliar application of [*p*-chlorophenyl–^{14}C]- and [triazole–^{14}C]-radiolabelled metconazole

Matrix	DAT1	TRR [a] [mg eq/kg]	Acetone/water surface rinse mg eq/kg (%TRR)	Acetone extract mg eq/kg (%TRR)	Methanol / water / extract [b] mg eq/kg (%TRR)	Water extract mg eq/kg (%TRR)	ERR mg eq/kg (%TRR)	PES mg eq/kg (%TRR)
[triazole–^{14}C]-metconazole								
Foliage	0	11	1.3 (12)	9.3 (87)	0.064 (0.6)	n/a	11 (100)	0.013 (0.1)
	13	8.7	3.5 (40)	4.5 (52)	0.37 (4.3)	n/a	8.4 (97)	0.30 (3.4)
	27	11	1.7 (15)	8.1 (73)	0.93 (8.3)	0.059 (0.5)	11 (97)	0.29 (2.6)
Straw	26	12	0.37 (3.1)	10 (85)	0.42 (3.5)	0.091 (0.8)	11 (93)	0.86 (7.2)
	42	49	2.1 (4.3)	37 (75)	4.8 (9.8)	0.77 (1.6)	45 (91)	4.4 (9.0)
Seed	26	1.6	n/a	0.17 (11)	1.2 (78)	0.17 (11)	1.6 (100)	0.008 (0.5)
	42	3.7	n/a	0.16 (4.3)	1.9 (51)	1.5 (40)	3.5 (95)	0.20 (5.3)
[*p*-chlorophenyl–^{14}C]-metconazole								
Foliage	0	8.8	0.58 (6.6)	8.1 (93)	0.043 (0.5)	n/a	8.8 (100)	0.012 (0.1)
	13	6.1	2.4 (39)	3.5 (57)	0.11 (1.8)	n/a	6.0 (98)	0.14 (2.2)
	27	8.4	2.3 (27)	5.8 (69)	0.19 (2.2)	0.029 (0.3)[c]	8.3 (99)	0.12 (1.5)
Straw	26	7.9	0.21 (2.7)	7.0 (89)	0.15 (1.9)	0.035 (0.4)	7.4 (94)	0.45 (5.7)
	42	60	2.9 (4.9)	45 (75)	6.6 (11)	0.89 (1.5)	55 (92)	4.8 (8.0)
Seed	26	0.044	n/a	0.031 (72)	0.003 (7.6)	0.002 (5.4)	0.037 (85)	0.007 (16)
	42	0.20	n/a	0.097 (48)	0.066 (32)	0.016 (8.0)	0.18 (88)	0.024 (12)

[a] Calculated as the sum of ERR and RRR

[b] Foliage (0 and 13 DAFT) was extracted with a mixture of acetone, methanol and water

[c] A combination of sub-extracts was not possible due to sample loss. In the 1st part 0.018 mg/kg and 0.2% TRR were recovered and in the 2nd part 0.011 mg/kg and 0.1% TRR.

The distribution of radioactivity in peas after treatment with [triazole–^{14}C]- and [*p*-chlorophenyl–^{14}C]-radiolabelled metconazole is presented in Tables 14 and 15. Parent metconazole was the major identified component in foliage ranging from 67–96% TRR (4.8–10 mg eq/kg), in straw ranging from 54–68% TRR (4.6–33 mg eq/kg) and in pea seed for the [*p*-chlorophenyl–^{14}C]-label ranging from 21–36% TRR (0.016–0.043 g eg/kg). As a major metabolite, triazolyl alanine was identified in pea seeds for the [triazole–^{14}C]-label at 75–85% TRR (1.2–3.2 mg eq/kg). Non-resolved isomers of hydroxylated metconazole as well as glucose conjugates ranged between 3.9–31% TRR (0.42–3.4 mg eq/kg) in foliage, 23–38% TRR (2.8–23 mg eq/kg) in straw and 7.5–67% TRR (0.021–0.31 mg eq/kg) in pea seed. The proposed metabolic pathway of metconazole is shown in Figure 2.

Table 14 Summary of identified/characterized residues in pea after two or three foliar application of [triazole–^{14}C]-radiolabelled metconazole

Fraction / Solubilizates	Radioactive residues in mg eq/kg (% TRR)						
	Foliage			Straw		Seed	
	0 DAT1	13 DAT1	27 DAT1	26 DAT1	42 DAT1	26 DAT1	42 DAT1
TRR	**11 (100)**	**8.7 (100)**	**11 (100)**	**12 (100)**	**49 (100)**	**1.6 (100)**	**3.7 (100)**
Extracts	**11 (100)**	**8.4 (97)**	**11 (97)**	**11 (93)**	**45 (91)**	**1.6 (100)**	**3.5 (95)**
Metconazole	10 (96)	6.9 (79)	7.4 (67)	7.8 (65)	33 (68)	0.053 (3.4)	0.081 (2.2)
Triazolyl alanine	n/d	n/d	n/d	n/d	n/d	1.2 (75)	3.2 (85)
Others [a]	0.42 (3.9)	1.6 (18)	3.4 (31)	3.4 (28)	11 (23)	0.31 (21)	0.23 (7.5)
Post extraction solids	**0.013 (0.1)**	**0.30 (3.4)**	**0.29 (2.6)**	**0.86 (7.2)**	**4.4 (9.0)**	**0.008 (0.5)**	**0.20 (5.3)**
0.1 M HCl extract	n/a	n/a	n/a	0.022 (0.18)	0.15 (0.31)	n/a	n/a
Acetonitrile/1 M HCl (9:1)	n/a	n/a	n/a	0.60 (5.0)	3.1 (6.3)	n/a	n/a
6 M HCl	n/a	n/a	n/a	0.024 (0.2)	0.16 (0.32)	n/a	n/a
Total identified	**10 (96)**	**6.9 (79)**	**7.4 (67)**	**7.8 (65)**	**33 (68)**	**1.3 (78)**	**3.3 (87)**
Total characterized	**0.42 (3.9)**	**1.6 (18)**	**3.4 (31)**	**4.1 (33%)**	**15 (30)**	**0.31 (21)**	**0.23 (7.5)**
Unextracted	**0.013 (0.1)**	**0.30 (3.4)**	**0.29 (2.6)**	**0.22(1.8)**	**1.0 (2.1)**	**0.008 (0.5)**	**0.20 (5.3)**
Total	**11 (100)**	**8.8 (101)**	**11 (100)**	**12 (100)**	**49 (98)**	**1.6 (100)**	**3.7 (100)**

[a] Including isomers of hydroxylated metconazole as well as glucose conjugates

Table 15 Summary of identified/characterized residues in pea after two or three foliar application of [*p*-chlorophenyl–^{14}C]-radiolabelled metconazole.

Fraction / Solubilizates	Radioactive residues in mg eq/kg (% TRR)						
	Foliage			Straw		Seed	
	0 DAT1	13 DAT1	27 DAT1	26 DAT1	42 DAT1	26 DAT1	42 DAT1
TRR	**8.8 (100)**	**6.1 (100)**	**8.4 (100)**	**7.9 (100)**	**60 (100)**	**0.044 (100)**	**0.20 (100)**
Extracts	**8.8 (100)**	**6.0 (98)**	**8.3 (99)**	**7.4 (94)**	**55 (92)**	**0.037 (85)**	**0.18 (88)**
Metconazole	8.2 (94)	4.8 (79)	6.7 (79)	4.6 (59)	33 (54)	0.016 (36)	0.043 (21)
Others[1]	0.51 (5.8)	1.2 (19)	1.6 (19)	2.8 (36)	23 (38)	0.021 (48)	0.14 (67)
Post extraction solids	**0.14 (2.2)**	**0.012 (0.1)**	**0.12 (1.5)**	**0.45 (5.7)**	**4.8 (8.0)**	**0.007 (16)**	**0.024 (12)**
0.1 mol/L HCl extract	n/a	n/a	n/a	0.014 (0.18)	0.19 (0.32)	n/a	n/a
Acetonitrile/1 mol/L HCl (9:1)	n/a	n/a	n/a	0.32 (4.1)	2.9 (4.9)	n/a	n/a
6 M HCl	n/a	n/a	n/a	0.005 (0.07)	0.05 (0.08)	n/a	n/a
Total identified	**8.2 (94)**	**4.8 (79)**	**6.7 (79)**	**4.6 (59)**	**33 (54)**	**0.016 (36)**	**0.043 (21)**
Total characterized	**0.51 (5.8)**	**1.2 (19)**	**1.6 (19)**	**3.1 (39)**	**26 (43)**	**0.021 (48)**	**0.14 (67)**
Unextracted	**0.14 (2.2)**	**0.012 (0.1)**	**0.12 (1.5)**	**0.10 (1.3)**	**1.7 (2.8)**	**0.007 (16)**	**0.024 (12)**
Total	**8.9 (102)**	**6.0 (98)**	**8.4 (100)**	**7.8 (99)**	**61 (102)**	**0.044 (100)**	**0.21 (101)**

[a] Including isomers of hydroxylated metconazole as well as glucose conjugates

Wheat

The metabolic fate of [triazole–^{14}C]-radiolabelled metconazole (98% *cis*-isomer) in wheat (variety Avalon) after one foliar application at 0.37 kg ai/ ha at BBCH 57–59 was investigated in the study by Edwards (1991a, METCON_026). Samples of straw and grain were taken 74 DAT.

The TRR in the homogenized samples was determined by combustion and LSC. In order to characterise and identify the radioactivity present, grain and straw samples were sequentially extracted with acetone, acetonitrile, acetonitrile/water (7/3, v/v) and two times with water. Further sub-samples of the acetonitrile phase were partitioned against either ethyl acetate or dichloromethane. Grain extracts were further treated with cellulase, β-glucuronidase, sulfatase and β-glucosidase, but did not result in the liberation of identifiable metabolites. Radioactivity in the post-extraction solids from straw was additionally extracted with either 0.1 mol/L NaOH, 2 M HCl or refluxed with water. TLC, HPLC against reference compounds, ion exchange chromatography, GC-MS and LC-MS were applied for the characterisation and identification of the radioactivity.

TRR levels in wheat grain were with 0.64–0.66 mg eq/kg generally an order in magnitude lower compared to wheat straw. A summary of the radioactive residues found is presented in Table 16.

Table 16 Total radioactive residues in wheat matrices after one foliar application of [triazole–^{14}C]-metconazole

Sampling interval (DAT)	Matrix	TRR determined by direct combustion, mg eq/kg	TRR calculated, mg eq/kg [a]
74	Grain	0.66	0.64
	Straw	6.3	5.7

[a] Sum of extracts and post-extraction residue (PES).

The radioactivity found in the fractions from the initial solvent extractions and in the unextracted remainder is presented in Table 17. Overall extractability was higher in grain at 92% TRR compared to straw at 74% TRR.

Table 17 Extractability of radioactive residues from wheat matrices after one foliar application of [triazole–^{14}C]-metconazole

Fraction	Grain		Straw	
	% TRR	mg/kg	% TRR	mg/kg
TRR	**100**	**0.66**	**100**	**6.3**
Acetone extract	0.8	-	40	-
Acetonitrile extract	< 0.1	-	7.6	-
Acetonitrile/water extract (7/3)	19	-	18	-
Water extract 1	65	-	7.0	-
Water extract 2	7.5	-	1.7	-
ERR [a]	**92**	**0.61**	**74**	**4.7**
Unextracted	**4.3**	**0.03**	**16**	**0.99**
Total	**97**	**0.64**	**89**	**5.7**

[a] Extracted radioactive residues

The distribution of radioactivity following one foliar application at 0.37 kg ai/ha is presented in Table 18. While parent metconazole was not detected in wheat grain, it accounted for 24% TRR (1.5 mg eq/kg) in wheat straw. Major metabolites were triazolyl alanine at 69% TRR (0.46 mg eq/kg) and triazolyl acetic acid at 23% TRR (0.16 mg eq/kg) in wheat grain only. The proposed metabolic pathway of metconazole is shown in Figure 2.

Table 18 Summary of identified/characterized residues in wheat matrices after one foliar application of [triazole–^{14}C]-metconazole

Fraction / Solubilizates	Radioactive residues in mg eq/kg (% TRR)	
	Grain	Straw
TRR	**0.66 (100)**	**6.3 (100)**
Solvent extracts	**0.61 (92)**	**4.7 (74)**
Metconazole (*cis*-isomer)	n/d	1.2 (19)
M2	n/d	< 0.25 (<4)

Fraction / Solubilizates	Radioactive residues in mg eq/kg (% TRR)	
	Grain	Straw
M11	n/d	< 0.25 (<4)
M35 (triazolyl alanine)	0.46 (69)	n/d
M34 (triazolyl acetic acid)	0.16 (23)	n/d
Characterized by HPLC	n/a	2.1 (33)
Water soluble metabolites	n/a	1.3 (21)
Post extraction solids	**0.03 (4.3)**	**1.2 (19)**
0.1 mol/L NaOH	n/a	0.99 (16)
Metconazole	n/a	0.28 (4.5)
Water soluble metabolites	n/a	0.34 (5.5)
Total identified	**0.62 (92)**	**2.0 (32)**
Total characterized	**n/a**	**3.7 (60)**
Unextracted	**0.03 (4.3)**	**0.21 (3.3)**
Total	**0.65 (96)**	**5.9 (95)**

The metabolic fate of [cyclopentyl–^{14}C]-radiolabelled metconazole, containing a *cis*:*trans* ratio of about 80:20, in wheat (variety Avalon) after one foliar application at 0.36 kg ai/ ha at BBCH 57–60 was investigated in the study by Edwards (1991b, METCON_027). Samples of straw and grain were taken 61 DAT. All samples were stored under deep freezer conditions until further processing.

The TRR in the homogenized samples was determined by combustion and LSC. In order to characterise and identify the radioactivity present, grain and straw samples were sequentially extracted with acetonitrile/water (9/1, v/v), acetonitrile/water (1/1, v/v) and water. Further sub-samples of the acetonitrile phase were partitioned against either ethyl acetate or dichloromethane. Radioactivity in the post-extraction solids from straw was additionally extracted with either 0.1 M NaOH, 2 M HCl or refluxed with water. TLC, HPLC against reference compounds, GC-MS and LC-MS were applied for the characterisation and identification of the radioactivity.

TRR levels in wheat grain were with 0.074 mg eq/kg about two orders in magnitude lower compared to wheat straw. A summary of the radioactive residues found is presented in Table 9.

Table 19 Total radioactive residues in wheat matrices after one foliar application of [cyclopentyl–^{14}C]-metconazole

Sampling interval (DAT)	Matrix	TRR determined by direct combustion, mg eq/kg	TRR calculated, mg eq/kg [a]
61	Grain	0.074	0.068
	Straw	5.9	5.6

[a] Sum of extracts and post-extraction residue (PES).

The radioactivity found in the fractions from the initial solvent extractions and in the unextracted remainder is presented in Table . Overall extractability was with 82% TRR in grain and 81% TRR in straw similar.

Table 20 Extractability of radioactive residues from wheat matrices after one foliar application of [cyclopentyl–^{14}C]-metconazole

Fraction	Grain		Straw	
	% TRR	mg/kg	% TRR	mg/kg
TRR	100	0.074	100	5.9
Acetonitrile/water extract (9/1)	19	-	66	-
Acetonitrile/water extract (1/1)	57	-	15	-
Water extract	6.7	-	-	-
ERR [a]	82	0.061	81	4.8
PES	10	0.007	14	0.83
Total	93	0.68	95	5.6

[a] Extracted radioactive residues

The distribution of radioactivity following one foliar application at 0.36 kg ai/ha is presented in Table 21. Parent metconazole accounted for 34% TRR (1.9 mg eq/kg) in wheat straw. Major metabolites were M11 at 9.8% TRR (0.58 mg eq/kg) and M21 at 9.7% TRR (0.57 mg eq/kg). The low TRR levels found in wheat grain was not further characterized. The proposed metabolic pathway of metconazole is shown in Figure 2.

Table 21 Summary of identified/characterized residues in wheat matrices after one foliar application of [cyclopentyl–^{14}C]-metconazole

Fraction / Solubilizates	Radioactive residues in mg eq/kg (% TRR) Straw
TRR	5.9 (100)
Solvent extracts	4.8 (81)
Metconazole (*cis*- and *trans*-isomer, 8/2)	1.9 (32)
M1 + others	< 0.27 (4.6)
M11	0.58 (9.8)
M21	0.57 (9.7)
M30 monohydroxy	0.14 (2.4)
Characterized by HPLC	0.68 (11)
Post extraction solids	0.83 (14)
0.1 mol/L NaOH	0.58 (9.8)
Metconazole	0.14 (2.4)
Characterized by HPLC	0.30 (5.1)
Total identified	3.6 (61)
Total characterized	0.98 (16)
Unextracted	0.26 (4.4)
Total	4.8 (81)

Oilseed rape

The metabolic fate of [triazole–^{14}C]-radiolabelled metconazole, containing a *cis*:*trans* ratio of about 80:20, in oilseed rape (variety Legend) was investigated in the study by Kao (1997a, Metcon_028). Plants received two foliar applications at a rate of 0.27 kg ai/ha per application. The first treatment occurred at the early flowering stage; while the second treatment occurred 14 days later. Oilseed rape foliage was sampled at 0, 14, 28 and 42 DAT1, while the rape pods and seeds were harvested at 44 DALA (58 DAT1).

The TRR in the homogenized samples was determined by combustion and LSC. To characterize and identify the radioactivity present, foliage samples were extracted three times with methanol, while pods were soaked in water overnight, followed by one extraction with methanol. Seeds were extracted three times with hexane, followed by four times with methanol and five times with water. The hexane phase was further partitioned against acetonitrile. Conjugates in the extracts were hydrolysed with β-glucosidase. If the post extracted solids contained more than 10% TRR, additional extraction with 2% HCl at room temperature was performed, followed by enzyme hydrolysis using pepsin, cellulose and refluxing with 6N HCl. HPLC against reference compounds and LC-MS were applied for the identification of the radioactivity.

Table 22 shows increasing TRR levels in foliage over time (up to 20 mg eq/kg at 28 DALA) indicating significant translocation of the radioactivity into the leaves. Radioactivity was high in pods as well, but about 8 times lower in seeds. The increased radioactivity in the 28 DALA (42 DAT1) foliage was explained by the loss of water in the mature plants.

Table 22 Total radioactive residues in oilseed rape plants after two foliar applications of [triazole–^{14}C]-metconazole

Sampling interval DAT1 (DALA)	Matrix	TRR determined by direct combustion, mg eq/kg
0 (–14)	Foliage	8.8
14 (0)		9.9

Sampling interval DAT1 (DALA)	Matrix	TRR determined by direct combustion, mg eq/kg
28 (14)		8.6
42 (28)		20
58 (44)	Pod	20
	Seed	2.4

The radioactivity extracted from homogenized oilseed rape matrices is presented in Table . Methanol extracted most of the radioactivity in all matrices except for seeds. The unextracted radioactivity increased with later sampling time points from 2.3% TRR at 0 DAT1 to 39% TRR at 42 DAT1.

Table 23 Extractability of radioactive residues from oilseed rape matrices after two foliar applications of [triazole–^{14}C]-metconazole

Fraction	Radioactive residues in mg eq/kg (% TRR)					
	Foliage 0 DAT1	Foliage 14 DAT1 (0 DALA)	Foliage 28 DAT1 (14 DALA)	Foliage 42 DAT1 (28 DALA)	Pods 58 DAT1 (44 DALA)	Seeds 58 DAT1 (44 DALA)
TRR	8.8 (100)	9.9 (100)	8.6 (100)	20 (100)	20 (100)	2.4 (100)
Methanol extracts	8.6 (98)	9.4 (93)	6.5 (76)	13 (61)	12 (62)	0.86 (36)
Water/methanol (3+1) extracts	n/a	n/a	n/a	n/a	2.5 (12)	n/a
Hexane extracts	n/a	n/a	n/a	n/a	n/a	0.29 (12)
Water extracts	n/a	n/a	n/a	n/a	n/a	0.76 (32)
ERR [a]	8.6 (98)	9.2 (93)	6.5 (76)	12 (61)	15 (74)	1.9 (80)
PES	0.18 (2.3)	0.69 (6.6)	2.1 (24)	7.9 (39)	5.2 (26)	0.48 (20)
Total	8.8 (100)	9.9 (100)	8.6 (100)	20 (100)	20 (100)	2.4 (100)

[a] Extracted radioactive residues

The distribution of radioactivity is presented in Table 24. Parent metconazole was a major residue in forage accounting for 51–93% TRR (4.4–10.4 mg eq/kg) and in seeds accounting for 20% TRR (0.47 mg eq/kg). As a major metabolite, triazolyl alanine was identified as well in seeds at 39% (0.92 mg eq/kg). Several glucose conjugates of metconazole and monohydroxylated metconazole metabolites where characterized by HPLC and LC-MS before and after glycosidase treatment accounting for more than 20% TRR in all sample matrices, except for foliage 0 DAT1 and 14 DAT 1. In pods, the sum of these metabolites accounted for most of the residue with 68% TRR (13 mg eq/kg). The proposed metabolic pathway of metconazole is shown in Figure 2.

Table 24 Summary of identified/characterized residues in oilseed rape matrices after two foliar applications of [triazole–^{14}C]-metconazole

Fraction	Radioactive residues in mg eq/kg (% TRR)					
	Foliage 0 DAT1	Foliage 14 DAT1 (0 DALA)	Foliage 28 DAT1 (14 DALA)	Foliage 42 DAT1 (28 DALA)	Pods 58 DAT1 (44 DALA)	Seeds 58 DAT1 (44 DALA)
TRR	8.8 (100)	9.9 (100)	8.6 (100)	20 (100)	20 (100)	2.4 (100)
Solvent extracts	8.6 (98)	9.2 (93)	6.5 (76)	12 (61)	15 (74)	1.9 (80)[e]
Metconazole	8.1 (93)	7.2 (73)	4.4 (51)	8.0 (40)	0.73 (3.7)	0.47 (20)
M11	n/d	n/d	0.11 (1.3)	0.29 (1.4)	0.26 (1.3)	0.07 (2.8)
M35 (triazolyl alanine)	n/d	n/d	0.19 (2.3)	0.31 (1.5)	1.2 (6.0)	0.92 (39)
Various glucose conjugates of metconazole and monohydroxylated metconazole metabolites	0.10 (1.2)	0.29 (0.29)	1.6 (18)	2.7 (16)	12 (61)	0.38 (16)
Others [g]	0.12 (1.4)	1.7 (17)	0.07 (0.8)	0.02 (0.1)	0.07 (0.3)	0.07 (3.0)
Unknown	0.19 (2.2)	n/d	0.14 (1.7)	0.51 (2.5)	0.42 (2.2)	0.02 (0.6)
Further extracts	0.19 (2.1)[a]	0.31 (3.1)[a]	0.66 (7.6)[b]	4.9 (24)[c]	1.8 (7.4)[d]	0.33 (14)[f]
Metconazole	n/d	n/d	0.38 (4.4)	2.4 (12)	0.70 (3.6)	0.11 (4.5)
M11	n/d	n/d	n/d	0.12 (0.6)	0.06 (0.3)	0.02 (1.4)

Fraction	Radioactive residues in mg eq/kg (% TRR)					
	Foliage 0 DAT1	Foliage 14 DAT1 (0 DALA)	Foliage 28 DAT1 (14 DALA)	Foliage 42 DAT1 (28 DALA)	Pods 58 DAT1 (44 DALA)	Seeds 58 DAT1 (44 DALA)
M35 (triazolyl alanine)	n/d	n/d	0.07 (0.9)	0.68 (3.4)	0.05 (0.3)	0.03 (1.5)
Various glucose conjugates of metconazole and monohydroxylated metconazole metabolites	n/d	n/d	n/d	1.5 (7.3)	0.41 (1.9)	0.16 (5.0)
Others [g]	n/d	n/d	0.17 (2.0)	0.27 (1.3)	0.18 (0.9)	0.04 (1.6)
Unknown	n/d	n/d	n/d	0.02 (0.1)	n/d	n/d
6 N HCl/MeOH extract	n/a	n/a	0.70 (8.1)	1.7 (8.5)	2.4 (12)	n/a
Metconazole	n/a	n/a	n/d	1.1 (5.6)	1.8 (9.1)	n/a
M11	n/a	n/a	n/d	n/d	0.02 (0.1)	n/a
M35 (triazolyl alanine)	n/a	n/a	0.18 (2.1)	0.15 (0.7)	0.06 (0.3)	n/a
Various glucose conjugates of metconazole and monohydroxylated metconazole metabolites	n/a	n/a	0.30 (4.5)	0.16 (0.8)	0.38 (1.9)	n/a
Others [g]	n/a	n/a	0.22 (2.5)	0.27 (1.3)	0.10 (0.5)	n/a
Unknown	n/a	n/a	n/d	0.01 (0.1)	0.01 (0.1)	n/a
Total identified	8.1 (93)	7.2(73)	5.3 (62)	13 (65)	4.9 (25)	1.6 (69)
Total characterized	0.6 (6.9)	2.3 (24)	2.5 (29)	6.0 (30)	13 (68)	0.67 (26)
Unextracted	0.02 (0.2)	0.35 (3.5)	0.76 (8.8)	1.2 (6.1)	1.3 (6.4)	0.15 (6.5)
Total	8.8 (99)	9.9 (100)	8.6 (100)	20 (101)	19 (99)	2.4 (102)

[a] Acid/MeOH/pepsin extract

[b] Sum of acid/pepsin/cellulase and Triton X–100 extract

[c] Acid+enzyme+Triton X–100 extract

[d] Sum of 2%HCl/MeOH, pepsin, water, cellulose, Triton X–100 extracts

[e] Sum of hexane, methanol and water extracts

[f] Sum of 2%HCl/MeOH and pepsin extract

[g] Multiple unresolved peak regions

A second study with oilseed rape (variety 45A71) was performed with [*p*-chlorophenyl–^{14}C]-radiolabelled metconazole, containing a *cis*:*trans* ratio of about 80:20 (Kao, 1997b, Metcon_029). Plants received two foliar applications at a rate of 0.26 kg ai/ha per application. The first treatment occurred at the early flowering stage; while the second treatment occurred 14 days later. Foliage was sampled at 0, 14, 28 and 42 DAT1, while pods and seeds were harvested at 50 DALA (64 DAT1). All samples were stored frozen at -11 to –33°C until further processing.

The TRR in the homogenized samples was determined by combustion, followed by LSC. To characterize and identify the radioactivity present, all samples (except canola seeds) were extracted three times with methanol (pods were soaked in water overnight prior to extraction). Canola seeds were extracted three times with hexane, followed by one time with methanol and two times with water. The hexane phase was further partitioned against acetonitrile. Conjugates in the extracts were hydrolysed with β-glucosidase. If post extraction solids contained more than 10% TRR, they were extracted additionally with one or more of the following reagent: water, 2% HCl, detergent (Triton X–100), enzymes (cellulose and pepsin) and ultimately refluxed with 6N HCl. HPLC against reference compounds and LC-MS were applied for the identification of the radioactivity.

Table 25Table shows increasing TTR levels in forage after the second application followed by decreasing levels at later sampling time points. Radioactivity was highest in pods, while lowest in seeds.

Table 25 Total radioactive residues in oilseed rape pants after two foliar applications of [*p*-chlorophenyl–^{14}C]-metconazole

Sampling interval DAT1 (DALA)	Matrix	TRR determined by direct combustion, mg eq/kg
0 (–14)	Foliage	11
14 (0)		15
28 (14)		5.6
42 (28)		5.9
64 (50)	Pod	21
	Seed	1.9

The radioactivity extracted from homogenized canola matrices is presented in Table . Methanol extracted the majority of the radioactivity in all matrices except for canola seeds. The unextracted radioactivity increased with later sampling time points from 2.3% TRR at 0 DAT1 to >20% TRR at 28 and 42 DAT1.

Table 26 Extractability of radioactive residues from oilseed rape matrices after two foliar applications of [*p*-chlorophenyl–^{14}C]-metconazole

Fraction	Radioactive residues in mg eq/kg (% TRR)					
	Foliage 0 DAT1	Foliage 14 DAT1 (0 DALA)	Foliage 28 DAT1 (14 DALA)	Foliage 42 DAT1 (28 DALA)	Pods 64 DAT1 (50 DALA)	Seeds 64 DAT1 (50 DALA)
TRR	11 (100)	15 (100)	5.6 (100)	5.9 (100)	21 (100)	1.9 (100)
Methanol extracts	11 (98)	14 (95)	4.1 (73)	4.4 (75)	13 (60)	0.64 (35)
Acetone/water extracts	n/a	n/a	n/a	n/a	0.96 (4.6)	n/a
Hexane extracts	n/a	n/a	n/a	n/a	n/a	0.27 (14)
Water extracts	n/a	n/a	n/a	n/a	n/a	0.42 (23)
ERR [a]	11 (98)	14 (95)	4.1 (73)	4.4 (75)	14 (65)	1.3 (72)
PES	0.24 (2.3)	0.71 (4.7)	1.5 (27)	1.5 (25)	7.3 (35)	0.60 (28)
Total	11 (100)	15 (100)	5.6 (100)	5.9 (100)	21 (100)	1.9 (100)

[a] Extracted radioactive residues

The distribution of radioactivity is presented in Table 27. Parent metconazole was a major identified residue in forage (foliage) accounting for 61–96% TRR (3.6–13 mg eq/kg), in pods accounting for 40% TRR (8.4 mg eq/kg) and in seeds accounting for 39% TRR (0.71 mg eq/kg). Several glucose conjugates of metconazole and monohydroxylated metconazole metabolites where characterized by HPLC and LC-MS before and after glycosidase treatment accounting for more than 25% TRR in all sample matrices, except for in foliage 0 and 14 DAT1. The proposed metabolic pathway of metconazole is shown in Figure 2.

Table 27 Summary of identified/characterized residues in oilseed rape matrices after two foliar applications of [*p*-chlorophenyl–^{14}C]-metconazole

Fraction	Radioactive residues in mg eq/kg (% TRR)					
	Foliage 0 DAT1	Foliage 14 DAT1 (0 DALA)	Foliage 28 DAT1 (14 DALA)	Foliage 42 DAT1 (28 DALA)	Pods 64 DAT1 (50 DALA)	Seeds 64 DAT1 (50 DALA)
TRR	11 (100)	15 (100)	5.6 (100)	5.9 (100)	21 (100)	1.9 (100)
Solvent extracts	11 (98)	14 (95)	4.1 (73)	4.4 (75)	14 (65)	1.3 (72)[a]
Metconazole	10 (96)	13 (85)	2.8 (49)	2.6 (45)	4.4 (21)	0.53 (29)
M11	0.05 (0.5)	0.16 (1.1)	0.05 (0.8)	0.06 (1.1)	0.24 (1.2)	0.09 (4.9)
Various glucose conjugates of metconazole and monohydroxylated metconazole metabolites	n/d	0.96 (6.4)	1.1 (19)	1.3 (22)	8.5 (41)	0.61 (33)
Others [e]	0.13 (1.3)	0.19 (1.3)	0.20 (3.6)	0.22 (3.8)	0.18 (0.9)	0.06 (2.9)
Unknown	n/d	0.19 (1.3)	0.02 (0.3)	0.19 (3.2)	0.11 (0.5)	0.04 (1.7)
Further extracts	n/a	n/a	0.50 (8.7)[b]	0.35 (6.1)[b]	0.95 (4.6)[c]	0.40 (22)[d]

Fraction	Radioactive residues in mg eq/kg (% TRR)					
	Foliage 0 DAT1	Foliage 14 DAT1 (0 DALA)	Foliage 28 DAT1 (14 DALA)	Foliage 42 DAT1 (28 DALA)	Pods 64 DAT1 (50 DALA)	Seeds 64 DAT1 (50 DALA)
Metconazole	n/a	n/a	0.32 (5.8)	0.21 (3.5)	0.28 (1.3)	0.18 (10)
M11	n/a	n/a	n/d	n/d	0.03 (0.2)	0.04 (2.5)
Various glucose conjugates of metconazole and monohydroxylated metconazole metabolites	n/a	n/a	0.02 (0.3)	0.04 (0.5)	0.23 (1.2)	0.15 (6.7)
Others [e]	n/a	n/a	0.03 (0.5)	0.11 (2.0)	0.17 (0.9)	0.02 (1.3)
Unknown	n/a	n/a	0.08 (0.5)	< 0.01 (0.1)	0.16 (0.8)	0.02 (0.9)
6 N HCl/MeOH extract	n/a	n/a	0.74 (13)	0.98 (17)	4.4 (21)	n/a
Metconazole	n/a	n/a	0.70 (13)	0.76 (13)	3.7 (18)	n/a
M11	n/a	n/a	n/d	0.01 (0.2)	0.03 (0.2)	n/a
Various glucose conjugates of metconazole and monohydroxylated metconazole metabolites	n/a	n/a	< 0.01 (0.1)	n/d	0.16 (0.8)	n/a
Others [e]	n/a	n/a	0.01 (0.2)	0.11 (1.8)	0.15 (0.7)	n/a
Unknown	n/a	n/a	< 0.01 (0.2)	0.10 (1.6)	0.33 (1.6)	n/a
Total identified	10 (97)	13 (86)	3.9 (69)	3.7 (63)	8.7 (42)	0.84 (46)
Total characterized	0.13 (1.3)	1.3 (9.0)	1.4 (26)	2.0 (35)	10 (49)	0.77 (47)
Unextracted	0.24 (2.3)	0.71 (4.7)	0.27 (4.9)	0.17 (2.9)	1.9 (9.3)	0.13 (6.8)
Total	11 (100)	15 (100)	5.6 (100)	5.9 (101)	21 (100)	1.7 (90)

[a] Sum of hexane, acetone and water extracts

[b] Sum of 2%HCl/MeOH/pepsin/cellulase and Triton X–100 extract

[c] Sum of 2%HCl/pepsin/cellulase and Triton X–100 extract

[d] Sum of 2%HCl/MeOH, pepsin extracts

[e] Multiple unresolved peak regions

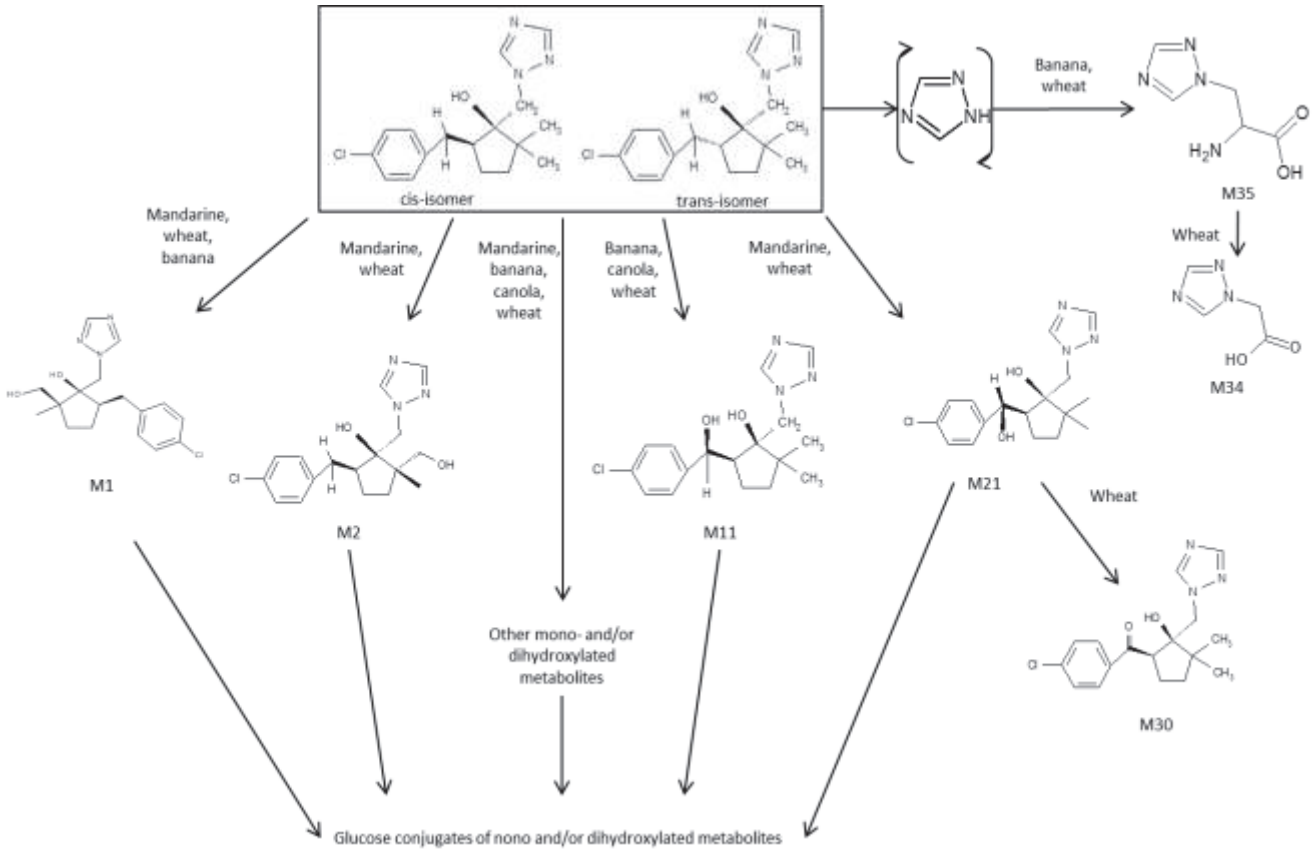


Figure 3 Proposed metabolic pathway of metconazole in primary crops

ANIMAL METABOLISM

Metabolism studies were provided for lactating goats and laying hens using [cyclopentyl–^{14}C]- and [triazole–^{14}C]-radiolabelled metconazole.

In lactating goats the transfer of radioactivity into milk and tissues was low. In edible tissue, highest TRR levels were found in liver and kidney, while in all other tissues TRR levels were one order of magnitude lower. Parent metconazole was the predominant residue in liver, while in kidney it was found only in minor amounts. Major metabolites identified were M1 (conjugated and unconjugated) in kidney, M12 in kidney and M31 (conjugated and unconjugated) in liver and kidney.

In laying hens transfer of radioactivity into tissues and eggs was low as well. In edible tissues, highest TRR levels were found in liver, followed by kidney. In all other matrices, residues were significantly lower. Parent metconazole was identified as a major residue in fat, skin and egg yolk only. Other metabolites occurring in significant amounts were M1 (conjugated and unconjugated) in liver, M1/M31 in abdominal fat, skin with fat and egg matrices, M12 free and conjugated in liver and 1,2,4-triazole in all tissues and egg matrices.

Laboratory animals

The evaluation of the metabolism studies in rats was carried out by the WHO Core Assessment Group.

Lactating goats

A metabolism study with lactating goats was performed with [cyclopentyl–1^{4}C]-metconazole containing a *cis:trans* ratio of 85:15 (Johnston, *et al*., 1992a, METCON_033). The compound was

administered orally to two lactating goats at 14 ppm (0.47 mg/kg bw per day) for 3 consecutive days (goat 1) or at 24 ppm (0.48 mg/kg bw per day) for 4 consecutive days (goat 2). Excreta were collected once daily and milk was collected twice daily. Selected milk samples were separated in cream, curds and whey. The animals were sacrificed approximately 18 hours after the last dose and liver, kidney, muscle, fat, bile, plasma and whole blood were collected.

Total radioactivity in liquid samples such as urine, plasma milk and various extracts were directly measured by LSC. Faecal, blood, bile and tissue samples were subjected to combustion prior to the determination of total radioactivity by LSC.

Liver and kidney samples of goat 2 were homogenized followed by extraction with acetonitrile, followed by acetonitrile/water (1:1, v/v) or acetonitrile/water (9:1, v/v). Muscle sample were extracted with methanol and fat sample with dichloromethane. Samples were further partitioned against solvents and the aqueous phase hydrolysed with 2 mol/L HCl to liberate conjugates. Characterization of the extracts was carried out by TLC and HPLC against reference standards.

The total recovery of the administered radioactivity was low for both goats ranging between 54–68%. The majority of the radioactivity was found in urine (28–37% AR), followed by faeces (25–30% AR). A summary of the recovered radioactivity is presented in Table 28.

Table 28 Recovered radioactive residues after oral administration of [cyclopentyl–^{14}C]-metconazole for 3 (goat 1) or 4 (goat 2) consecutive days lactating goats

Matrix	Goat 1 (14 ppm)		Goat 2 (24 ppm)	
	% AR	mg eq/kg	% AR	mg eq/kg
Faeces	30	n/a	25	n/a
Urine	37	n/a	28	n/a
Urine of bladder	n/a	11	n/a	58
Cage wash	1.3	n/a	0.96	n/a
Milk (total of day 2–5)	n/a	0.016	n/a	0.013
Liver	n/a	0.46	n/a	0.56
Kidney	n/a	0.15	n/a	0.28
Muscle (fore leg)	n/a	0.001	n/a	0.005
Muscle (hind leg)	n/a	0.004	n/a	0.005
Renal fat	n/a	<LOD	n/a	<LOD
Deep body fat	n/a	0.015	n/a	0.003
Bile	n/a	3.8	n/a	8.5
Adrenal	n/a	0.010	n/a	0.029
Blood	n/a	0.018	n/a	0.029
Plasma	n/a	0.024	n/a	0.035
Total	68		54	

In milk the total radioactivity in both goats was very low, increasing only slightly over the whole dosing period, starting from 0.003 mg eq/kg (goat 1) and 0.001 mg eq/kg (goat 2) at day 2 (morning) to a terminal concentration of 0.004 mg eq/kg at day 4 (morning) for goat 1 and 0.004 mg eq/kg at day 5 (morning). The results are summarized in the following Table . Residue levels reached a plateau after 3 days in goat 1 (14 ppm), while no plateau was reached in goat 2 (24 ppm) after 4 days of consecutive administration of the compound.

Table 29 Recovered radioactive residues in milk after oral administration of [cyclopentyl–^{14}C]-metconazole for 3 (goat 1) or 4 (goat 2) consecutive days to goats

TRR in milk Days	Goat 1 (14 ppm) TRR in mg eq/kg	Goat 2 (24 ppm) TRR in mg eq/kg
2 (morning)	0.003	0.001
2 (afternoon)	0.002	0.001
3 (morning)	0.004	0.002
3 (afternoon)	0.003	0.001
4 (morning)	0.004	0.002
4 (afternoon)	n/a	0.002
5 (morning)	n/a	0.004

Extraction with acetonitrile, followed by acetonitrile/water (1:1, v/v) released between 96% TRR from liver and 98%TRR in kidney. A summary of the results is presented in Table . Normal phase HPLC of extracts also demonstrated a shift of the *cis:trans* ratio of metconazole from 80:20 to 34:66, indicating faster metabolism of the *cis* isomer.

Table 30 Extractability of residues from liver and kidney after oral administration of [cyclopentyl–^{14}C]-metconazole to lactating goats

Fraction	Goat 2 (24 ppm)			
	Liver		Kidney	
	%TRR	mg eq/kg	%TRR	mg eq/kg
TRR	100	0.56	100	0.28
Acetonitrile extract	81	0.45	79	0.22
Acetonitrile/water (1/1, v/v) extract	15	0.085	19	0.052
Total extracts	96	0.54	98	0.27
Post extraction solids	3.7	0.021	2.5	0.007
Total recovered radioactivity	100	0.56	100	0.28

Parent metconazole was the major residue in liver only at 42% TRR (0.24 mg eq/kg). In all other matrices residues of metconazole were significantly lower. In kidney, identified major metabolites were M12 and M13 at 14% TRR (0.038 mg eq/kg) and 20% TRR (0.055 mg eq/kg), respectively. Other identified metabolites occurring at smaller fractions were M1 and M2/M15. Unextracted residues ranged between 4–18% TRR (< 0.001–0.067 mg eq/kg) (Table). The proposed metabolic pathway of metconazole is shown in Figure 4.

Table 31 Summary of identified/characterized residues in tissues after oral administration of [cyclopentyl–^{14}C]-metconazole to lactating goats

Fraction	Goat 2 (24 ppm) mg eq/kg (%TRR)			
	Liver	Kidney	Muscle	Fat
TRR	0.56 (100)	0.28 (100)	0.005 (100)	0.023 (100)
Solvent extracts [f]	0.49 (88)	0.25 (89)	0.004 (82)	< 0.012 (96)
Metconazole	0.24 (42)[a]	0.010 (3.7)[c]	< 0.001 (13)	< 0.003 (14)
M1	n/d	0.038 (14)[e]	n/d	n/d
M2/M15	n/d	0.010 (3.6)[e]	n/d	n/d
M12	n/d	0.055 (20)	n/d	n/d
M13	n/d	0.003 (1.0)	n/d	n/d
Characterized by HPLC	0.26 (46)[b]	0.13 (47)[d]	0.003 (69)	0.019 (82)
Total identified	0.24 (42)	0.12 (42)	< 0.001 (13)	< 0.003 (14)
Total characterized	0.26 (46)	0.13 (47)	0.003 (69)	< 0.019 (82)
Unextracted	0.067 (12)	0.030 (11)	0.001 (18)	< 0.001 (4)
Total	0.56 (100)	0.28 (100)	0.005 (100)	0.023 (100)

[a] Sum of metconazole directly determined in extract and after acid hydrolysis (contribution: 0.026 mg eq/kg)

[b] Individual components did not exceed 0.058 mg eq/ kg (10% TRR)

[c] Sum of metconazole directly determined in extract and after acid hydrolysis (contribution: 0.007 mg eq/kg)

[d] Individual components did not exceed 0.031 mg eq/ kg (11% TRR)

[e] Probably occurring as conjugates, since detected after acidic hydrolysis.

[f] Acetonitrile/water (9:1, v/v) for liver and kidney, methanol for muscle and dichloromethane for fat

A second metabolism study with lactating goats was as well performed with [cyclopentyl–^{14}C]-metconazole as *cis*-isomer only (Richardson, 1993, METCON_034). The compound was administered orally to one lactating goat at 11 ppm (0.64 mg/kg bw per day) for 4 consecutive days. Excreta were collected once daily and milk was collected twice daily. The animal was sacrificed

approximately 18 hours after the last dose and liver, kidney, muscle, fat, bile, plasma and whole blood were collected.

Total radioactivity in liquid samples such as urine, plasma milk and various extracts were directly measured by LSC. Faecal, blood, bile and tissue samples were subjected to combustion prior to the determination of total radioactivity by LSC.

After homogenization, liver and kidney samples were extracted with acetonitrile/ water (9:1, v/v), followed by methanol. Samples were further partitioned against dichloromethane or diethyl ether and the aqueous phase hydrolysed with 2 mol/L HCl to liberate conjugates. Characterization of the extracts was carried out by TLC, HPLC against reference standards as well as GC-MS and LC-MS.

The total recovery of the administered radioactivity was equal to 101%. The majority of the radioactivity was found in faeces (46% AR), followed by urine (43% AR). Radioactive residues in the edible matrices were highest in liver and kidney at 0.32 mg eq/kg and 0.15 mg eq/kg, respectively. In milk, residues were rather low at 0.011 mg eq/kg. A summary of the recovered radioactivity is presented in Table 32 and Table 33.

Table 32 Recovered radioactive residues after oral administration of 11 ppm [cyclopentyl–^{14}C]-metconazole (*cis*-isomer) for 4 consecutive days

Matrix	% AR
Faeces	46
Urine	43
Cage wash	0.92
GI Tract	10
Carcass	0.49
Total	101

Table 33 Total radioactive residues in matrices after oral administration of 11 ppm [cyclopentyl–^{14}C]-metconazole (*cis*-isomer) for 4 consecutive days

Matrix	TRR (mg eq/kg)
Milk (total of day 2–5)	0.011
Liver	0.32
Kidney	0.15
Muscle (fore leg)	0.004
Muscle (hind leg)	0.007
Renal fat	<LOD
Deep body fat	0.006
Bile	4.9
Adrenal	0.018
Blood	0.016
Plasma	0.019
Bladder urine	7.5

In milk, the found radioactivity was very low, ranging between 0.001–0.002 mg eq/kg. The results are summarized in the following Table 34. A plateau was reached after 3 days of consecutive administration of the compound.

Table 34 Recovered radioactive residues in milk after oral administration of 11 ppm [cyclopentyl–^{14}C]-metconazole (*cis*-isomer) for 4 consecutive days

Day	TRR (mg eq/kg)
2 (morning)	0.002
2 (afternoon)	0.001

Day	TRR (mg eq/kg)
3 (morning)	0.002
3 (afternoon)	0.001
4 (morning)	0.002
4 (afternoon)	0.001
5 (morning)	0.002

Extraction with acetonitrile/water (9/1, v/v) followed by methanol released between 94% TRR from liver and 98% TRR in kidney. A summary of the results is presented in Table 35.

Table 35 Extractability of residues from liver and kidney after oral administration of 11 ppm [cyclopentyl–^{14}C]-metconazole (*cis*-isomer) for 4 consecutive days

Fraction	Liver		Kidney	
	%TRR	mg eq/kg	%TRR	mg eq/kg
TRR	100	0.32	100	0.15
Acetonitrile/water (9/1, v/v) extract	86	0.27	96	0.14
Methanol extract	8	0.025	4	0.006
Total extracts	94	0.30	98	0.15
Post extraction solids	6	0.019	4	0.006
Total recovered radioactivity	100	0.32	102	0.15

Parent metconazole was the major residue in liver only at 33% TRR (0.29 mg eq/kg). Additionally, major metabolites detected were M1 in kidney at 12% TRR (0.018 mg eq/kg); M12 in kidney at 13% TRR (0.020 mg eq/kg) and M31 in kidney and liver ranging between 15–20% TRR (0.022–0.063 mg eq/kg). Other identified metabolites occurring at smaller fractions were unresolved M2/M19 and M32. Unextracted residues ranged between 6–9% TRR (0.009–0.029 mg eq/kg) (Table 36). The proposed metabolic pathway of metconazole is shown in Figure 4.

Table 36 Summary of identified/characterized residues in tissues after oral administration of 11 ppm [cyclopentyl–^{14}C]-metconazole (*cis*-isomer) for 4 consecutive days

Fraction	mg eq/kg (%TRR)	
	Liver	Kidney
TRR	0.32 (100)	0.15 (100)
Solvent extracts	0.29 (91)	0.14 (94)
Metconazole	0.11 (33)[a]	0.003 (1.7)
M1	0.022 (6.9)[b]	0.018 (12)[b]
M2/M19	n/d	0.009 (6.0)
M12	n/d	0.020 (13)
M31	0.063 (20)[b]	0.022 (15)[b]
M32	0.013 (4.1)[b]	0.011 (7.7)[b]
Characterized by HPLC	0.072 (23)	0.057 (39)
Total identified	0.21 (64)	0.083 (56)
Total characterized	0.072 (23)	0.057 (39)
Unextracted	0.029 (9)	0.009 (6)
Total	0.31 (96)	0.15 (100)

[a] Sum of metconazole directly determined in extract and after acidic hydrolysis (contribution: 0.007 mg eq/kg)

[b] Probably occurring as conjugates, since detected after acidic hydrolysis.

A third metabolism study with lactating goats was performed with [triazole–^{14}C]-radiolabelled metconazole containing a *cis:trans* ratio of 85:15 (Jalal, 2006a, METCON_035). The compound was administered to one lactating goat after morning and afternoon milking at a nominal daily dose of 10 ppm (0.46 mg/kg bw) for four consecutive days. Excreta were collected once daily, while milk was collected twice daily. The animal was sacrificed approximately 17 hours after the last

dose. Liver, kidney, muscle, fat (omental, perirenal and subcutaneous), bile and gastrointestinal tract contents were collected. Sample of kidney, liver muscle and fat were homogenized with dry ice.

Total radioactivity in tissue samples was determined by combustion prior to the determination of radioactivity by LSC, while liquid samples were directly measured by LSC.

Tissues samples of homogenized liver and kidney were extracted three times with acetonitrile, followed by a single extraction with water and ethanol. Samples were further hydrolysed with 6 M HCl to liberate conjugates. Characterization of the extracts and identification of its constituents was carried out by TLC and HPLC against reference standards, as well as LC-MS/MS and NMR spectroscopy.

The total recovery of the administered radioactivity was equal to 86%. The majority of the radioactivity was found in faeces (50%) and followed by urine (36%). Radioactive residues in the edible matrices were highest in liver and kidney at 0.22 mg eq/kg and 0.11 mg eq/kg, respectively. A summary of the recovered radioactivity is presented in Table 37.

Table 37 Recovered radioactive residues after oral administration of 10ppm [triazole-^{14}C]-metconazole for 4 consecutive days to a lactating goat

Matrix	% AR	TRR in mg eq/kg
Faeces	50	18
Urine	36	10
Cage wash	n/a	0.13
Milk	< 0.1	0.017
Liver	0.3	0.22
Kidney	< 0.1	0.11
Muscle	< 0.1	0.004
Fat	< 0.1	0.003
Bile	< 0.1	4.3
Whole blood	< 0.1	0.016
Blood plasma	< 0.1	0.023
Blood cells	< 0.1	0.006
Total	86	

In milk the total radioactivity increased only slightly over the time of the study (Table 38). Residue levels in milk reached a plateau after approximated 3 days.

Table 38 Recovered radioactive residues in milk after oral administration of 10 ppm [triazole–^{14}C]-metconazole for 4 consecutive days to a lactating goat.

TRR in milk (days after first dose)	TRR in mg eq/kg
–1	< 0.001
1	0.003
2	0.004
3	0.005
4	0.005

The initial acetonitrile extraction released 74% TRR and 54%TRR in liver and kidney, respectively. Additionally, the water and ethanol extract released another 20% TRR from liver and 42% TRR from kidney. A summary of the results is presented in Table 39.

Table 39 Characterization of radioactivity in kidney and liver from a lactating goat dosed with 10 ppm [triazole–^{14}C]-metconazole for 4 consecutive days

Fraction	Liver		Kidney	
	mg eq/kg	%TRR	mg eq/kg	%TRR
TRR	0.23	100	0.11	100
Acetonitrile extract	0.18	74	0.063	54
Water and ethanol extract	0.048	20	0.049	42

Fraction	Liver		Kidney	
	mg eq/kg	%TRR	mg eq/kg	%TRR
Total extracts	0.23	94	0.11	96
Unextracted	0.015	6.4	0.004	3.7
Total recovered radioactivity	0.24	104	0.12	106

Characterization and identification was only done for liver and kidney, as in all other matrices the TRR was too low. The predominant residue in liver was parent metconazole accounting for 38% TRR (0.090 mg eq/kg), while in kidney parent only occurred in minor amounts. Major identified metabolites were M12 in kidney at 21% TRR (0.024 mg eq/kg), the M1 glucuronide in kidney at 12% TRR (0.014 mg eq/kg) and the M31 glucuronide in liver and kidney at 14–24% TRR (0.028–0.033 mg eq/kg). Additionally metabolites M1, M32 and their respective glucuronide conjugates were detected in minor amounts. It should be noted that 1,2,4 triazole was not detected in any of the samples. The proposed metabolic pathway of metconazole is shown in Figure 3.

Table 6: Summary of identified/characterized residues in kidney and liver from a lactating goat dosed with 10 ppm [triazole–^{14}C]-metconazole for 4 consecutive days

Fraction	**Liver**		**Kidney**	
	mg eq/kg	**%TRR**	**mg eq/kg**	**%TRR**
TRR	**0.23**	**100**	**0.11**	**100**
Metconazole	0.090	38	0.002	2.3
cis-metconazole	*0.053*	*22*	*0.001*	*1.2*
trans-metconazole	*0.037*	*16*	*0.001*	*1.1*
M12	0.004	1.7	0.024	21
M1	n/a		0.001	0.9
M1 (M555F001)/M31 (M555F031, *cis*)	0.003	1.3	n/a	
M31 (M555F031, *trans*)	0.015	6.0	n/d	
M32 (M555F032, *cis*)	0.002	0.8	n/d	
M1 glucuronide	0.011	4.4	0.014	12
M31 glucuronide	0.033	14	0.028	24
M32 glucuronide	0.006	2.3	0.007	5.7
M31 glucuronide, *trans*	0.006	2.6	n/d	
Characterized by HPLC	0.056[a]	23	0.036[b]	31
Total identified	**0.17**	**70**	**0.076**	**65**
Total characterized	**0.056**	**23**	**0.036**	**31**
Unextracted	**0.015**	**6.4**	**0.004**	**3.7**
Total	**0.24**	**101**	**0.011**	**100**

[a] Individual components did not exceed 0.006 mg eq/ kg (2.6% TRR)

[b] Individual components did not exceed 0.010 mg eq/ kg (8.9% TRR)

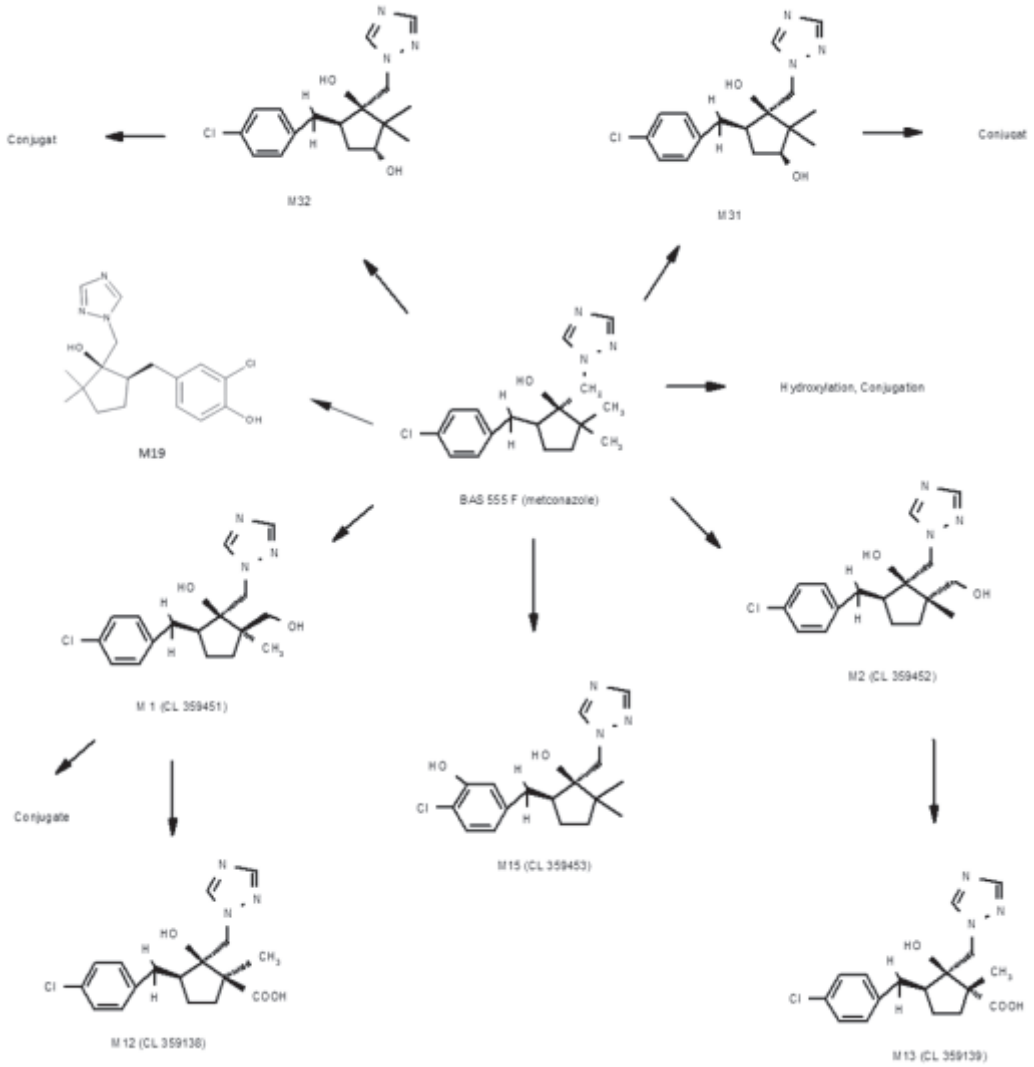


Figure 3 Proposed metabolic pathway of metconazole in lactating goats

Laying hens

A metabolism study with laying hens was performed with [cyclopentyl–1^{4}C]-metconazole (Johnston, *et al.,* 1992b, METCON_036). The compound was administered for 28 consecutive days to 15 laying hens at 7 ppm (~0.60 mg/kg bw per day). Excreta were collected once daily while eggs were collected at least once daily. Three hens were sacrificed at each of the following time points: 6, 18, 48, 96 and 144 hours after the final dose. Liver, kidney, heart, muscle, skin, blood, egg (yolk, white and shell) gizzard and carcass were collected.

Total radioactivity in liquid samples such as egg, plasma, cage wash and various extracts were directly measured by LSC. All tissues and excreta samples were subjected to combustion prior to the determination of total radioactivity by LSC.

After 28 days of dosing, the majority of the radioactivity was found in excreta (91–97%) demonstrating fast elimination of the compound. The remaining radioactivity in the carcass dropped from 1.1% AR at 6 h sacrifice to 0.05% AR at 144 h sacrifice, indicating also a rapid depuration after cessation of the dosing. Radioactive residues in the edible matrices were highest in liver and kidney 6 h sacrifice at 0.60 mg eq/kg and 0.33 mg eq/kg, respectively. With prolonged depuration levels

dropped to 0.025 mg eq/kg in liver and 0.020 mg eq/kg in kidney. A summary of the recovered radioactivity is presented in Table 41and Table 42.

Table 41 Recovered radioactive residues after oral administration of 7 ppm [cyclopentyl–^{14}C]-metconazole for 28 consecutive days to laying hens

Sample	Recovered dose in %AR (sacrifice time after administration of the last dose)				
	Hen No. 1 (6 h)	Hen No. 4 (18 h)	Hen No. 7 (48 h)	Hen No. 10 (96 h)	Hen No. 13 (144 h)
Excreta	92	91	97	97	96
Cage wash	3.4	3.4	2.2	2.9	3.2
Carcass	1.1	0.96	0.14	0.07	0.05
Total	97	96	99	100	99

Table 42 Total radioactive residues in tissue after oral administration of 7 ppm [cyclopentyl–^{14}C]-metconazole for 28 consecutive days to laying hens

Sample	Sacrifice time following post-dosing (TRR in mg eq/kg)				
	6 h	18 h	48 h	96 h	144 h
Liver	0.60	0.31	0.067	0.041	0.025
Kidney	0.33	0.16	0.045	0.025	0.020
Heart	0.063	0.024	0.004	0.000	0.000
Muscle (breast)	0.027	0.010	0.000	0.000	0.000
Skin	0.078	0.056	0.016	0.006	0.000
Blood	0.089	0.049	0.025	0.021	0.016
Gizzard	0.38	0.11	0.007	0.002	0.000
Fat	0.15	0.045	0.013	0.013	0.000

Incorporation of radioactivity into egg whites reached steady state within two days, remained fairly constant throughout the dosing period and then declined rapidly during the depuration phase. Radioactivity was incorporated more slowly into egg yolks reaching a plateau on day 8. Similar, TRR levels in whole eggs did reach a plateau after 8 days as well. A summary of the recovered radioactivity is presented in Table 43. There were no detectable levels of TRR in egg shells.

Table 43 Recovered radioactive residues in eggs after oral administration of 7 ppm [cyclopentyl–^{14}C]-metconazole for 28 consecutive days to laying hens

Collection interval [days]	Sample matrix (TRR in mg eq/kg)		
	Egg whites	Egg yolks	Whole egg
2	0.057	0.025	0.047
4	0.090	0.098	0.093
8	0.059	0.18	0.096
12	0.052	0.18	0.091
16	0.070	0.16	0.097
20	0.065	0.18	0.099
24	0.059	0.18	0.096
28	0.048	0.17	0.083
30 (depuration)	0.008	0.15	0.055
32 (depuration)	0.001	0.11	0.034
34 (depuration)	0.000	0.051	0.001

No identification or characterization of the radioactive residues was conducted.

A second study with laying hens was performed with [cyclopentyl–^{14}C]-metconazole (Johnston, *et al*., 1992c, METCON_037). The compound was administered for 14 consecutive days to 15 laying hens at 8 ppm (0.64 mg/kg bw per day). Excreta were collected once daily while eggs were collected when observed or at least once daily. All hens were sacrificed at 6 hours after the final dose and liver, kidney, heart, muscle, skin, blood, egg (yolk, white and shell) gizzard and carcass were collected.

Total radioactivity in liquid samples such as egg white and yolk, as well as and various extracts were directly measured by LSC. All tissues and excreta samples were subjected to combustion prior to the determination of total radioactivity by LSC.

Radioactivity in egg whites and yolks, as well as in tissues was in good agreement with results previously obtained (see Table 44 vs. Table 43 and Table 45 vs. Table 42). As plateau concentrations in eggs from the previous study were reached after maximum 8 days, TRR levels reported in Table 44were already at steady state levels.

Table 44 Recovered radioactive residues in eggs after oral administration of 8 ppm [cyclopentyl–^{14}C]-metconazole for 14 consecutive days to laying hens

Collection interval [days]	TRR [mg eq/kg]		
	Egg whites	Egg yolks	Whole egg
8	0.069	0.18	0.10
12	0.060	0.18	0.094
14	0.060	0.18	0.095

Table 45 Total radioactive residues in tissue after oral administration of 8 ppm [cyclopentyl–^{14}C]-metconazole for 14 consecutive days to laying hens

Sample	TRR [mg eq/kg]
Liver	0.66
Kidney	0.36
Muscle (breast)	0.024
Skin	0.069
Fat	0.13

Again, no identification or characterization of the radioactive residues was performed.

A third metabolism study with laying hens was performed with [cyclopentyl–^{14}C]-metconazole (5 hens) at 14 ppm (0.73 mg/kg bw per day) and [triazole–^{14}C]-metconazole (5 hens) at 13 ppm (0.75 mg/kg bw per day) for 4.5 consecutive days (Jalal, 2006b, METCON_038). The test material contained a *cis:trans* ratio of 85:15. Excreta were collected once daily, while eggs were collected twice daily and separated into whites and yolk. All hens were sacrificed at 4.5 hours after the final dose and samples of blood, abdominal fat, skin with fat, breast muscle, thigh muscle and liver were collected.

All tissues and excreta samples were subjected to combustion prior to the determination of total radioactivity by LSC. Total radioactivity in liquid samples was directly measured by LSC.

Samples of liver, breast muscle, thigh muscle, abdominal fat, skin with fat, egg white and egg yolk, were extracted three times with acetonitrile, followed by two times with water. Insoluble oily droplets were dissolved with hexane. The extract (cyclopentyl label only) from liver was hydrolysed with 6 M HCl. The PES from liver samples of both labels was hydrolysed with 2 M HCl and partitioned with ethyl acetate. Characterization of the extracts was carried out by TLC, HPLC against reference standards as well as LC-MS(MS) and NMR.

The majority of the radioactivity was found for both labels in excreta (11–19 mg eq/kg). Radioactive residues in the edible matrices were highest in liver at 0.75–0.97 mg eq/kg. Incorporation of radioactivity into egg whites reached steady state within 3–4 days, while the radioactivity was incorporated more slowly into egg yolks not reaching a plateau on within the study time. No information was given on kidney. A summary of the recovered radioactivity is presented in Table 46.

Table 46 Total radioactive residues in excreta, tissues and eggs after oral administration of [cyclopentyl–^{14}C]- and [triazole–1^{4}C]-radiolabelled metconazole for 4.5 consecutive days to laying hens

Matrix	TRR [mg/kg]			
	Measured	Calculated [a]	Measured	Calculated [a]
	[cyclopentyl–1^{4}C]-metconazole (14 ppm)		[triazole–1^{4}C]-metconazole (13 ppm)	
Breast muscle	0.030	0.031	0.14	0.15
Thigh muscle	0.045	0.049	0.14	0.15
Liver	0.75	0.79	0.90	0.97
Skin	0.070	0.075	0.13	0.14
Abdominal fat	0.093	0.091	0.13	0.14
Egg white day -1	< 0.001	0.047	< 0.001	0.19
Egg white day 1	< 0.001		0.017	
Egg white day 2	0.037		0.088	
Egg white day 3	0.049		0.14	
Egg white day 4	0.041		0.17	
Egg white day 5	0.046		0.17	
Egg yolk day -1	< 0.001	0.088	< 0.001	0.16
Egg yolk day 1	< 0.001		0.005	
Egg yolk day 2	0.011		0.036	
Egg yolk day 3	0.032		0.092	
Egg yolk day 4	0.066		0.13	
Egg yolk day 5	0.096		0.16	
Blood plasma	0.078	n/a	0.18	n/a
Blood cells	0.08	n/a	0.18	n/a
Whole blood	0.080	n/a	0.18	n/a
Excreta day 1	11	15	14	16
Excreta day 2	11		17	
Excreta day 3	13		18	
Excreta day 4	15		19	
Excreta day 5	15		14	

[a] Calculated as sum of ERR + RRR

The acetonitrile and water extractions released 86–99% TRR from tissues and egg matrices for both labels. A summary of the results is presented in Table 47.

Table 47 Extractability of residues from eggs and tissues after oral administration of [cyclopentyl–^{14}C]- and [triazole–^{14}C]-radiolabelled metconazole for 4.5 consecutive days to laying hens

Matrix	TRR (calculated) mg/kg	Acetonitrile or hexane extract		Aqueous extract		ERR		PES	
		mg/kg	% TRR	mg/kg	% TRR	mg/kg	% TRR	mg/kg	% TRR
[cyclopentyl–^{14}C]-metconazole (14 ppm)									
Breast muscle	0.031	0.028	89	0.001	4.0	0.029	93	0.002	6.6
Thigh muscle	0.049	0.042	87	0.003	5.9	0.045	93	0.003	6.8
Liver	0.79	0.64	81	0.081	10	0.72	91	0.068	8.6
Skin	0.075	0.066	88	0.005	6.8	0.071	94	0.004	5.7
Fat	0.091	0.086	94	0.004	3.9	0.089	98	0.001	1.6
Egg white	0.047	0.045	96	0.001	2.2	0.046	98	0.001	2.0
Egg yolk	0.088	0.070	79	0.006	7.1	0.076	86	0.012	14
Excreta	15	9.4	63	5.3	35	15	98	0.32	2.1
[triazole–^{14}C]-metconazole (13 ppm)									
Breast muscle	0.15	0.13	88	0.013	8.6	0.14	96	0.005	3.6
Thigh muscle	0.15	0.14	91	0.010	6.6	0.15	97	0.004	2.9
Liver	0.97	0.80	82	0.098	10	0.90	92	0.077	7.9
Skin	0.14	0.12	91	0.007	5.1	0.13	96	0.005	4.0
Fat	0.14	0.13	89	0.012	8.7	0.14	98	0.003	2.0
Egg white	0.19	0.18	98	0.003	1.6	0.19	99	0.001	0.6

Matrix	TRR (calculated) mg/kg	Acetonitrile or hexane extract		Aqueous extract		ERR		PES	
		mg/kg	% TRR	mg/kg	% TRR	mg/kg	% TRR	mg/kg	% TRR
Egg yolk	0.16	0.14	89	0.007	4.2	0.15	93	0.011	7.1
Excreta	16	9.88	62	5.8	36	15	98	0.37	2.3

Parent metconazole was identified as a major residue for both labels in abdominal fat and skin with fat as well as for [cyclopentyl–^{14}C]-metconazole in eggs yolk, ranging between 11–37% TRR (0.010–0.050 mg eq/kg). Metabolites occurring in significant amounts were: M1 in liver free at 13% TRR (0.10 mg eq/kg) and as the sum of free and conjugated at 16% TRR (0.13 mg eq/kg); the sum of the co-eluting metabolites M1 and M31 in abdominal fat, skin with fat and egg matrices ranging between 11–28% TRR (0.010–0.025 mg eq/kg); M12 free and conjugated in liver at 12% (0.091 mg eq/kg) and M20 (1,2,4-triazole) in all tissues and egg matrices from [triazole–^{14}C]-dosed hens ranging between 13–77% (0.019–0.27 mg eq/kg). Moreover, sulphate conjugated mono-hydroxy metconazole was detected in egg yolk for the [cyclopentyl–^{14}C]-label at 13% TRR (0.0012 mg eq/kg). Additional minor identified metabolites were M31 in liver, M32 (free and conjugated) in liver, muscle, fat, skin and egg. (Tables 48 to 51). The proposed metabolic pathway of metconazole is shown in Figure 4.

Table 48 Summary of identified/characterized residues in liver and muscle after oral administration of 14 ppm [cyclopentyl–^{14}C]-radiolabelled metconazole for 4.5 consecutive days to laying hens

Components	Liver (pre-hydrolysis)		Liver (post-hydrolysis)		Breast muscle		Thigh muscle	
	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]
TRR	**0.79**	**100**	**0.79**	**100**	**0.031**	**100**	**0.049**	**100**
Total metconazole	0.034	4.3	0.033	4.1	0.002	5.4	0.005	9.8
cis-metconazole	0.031	3.9	-	-	0.001	1.8	0.002	3.7
trans-metconazole	0.003	0.4	-	-	0.001	3.6	0.003	6.0
M1	0.10	13	0.13	16	-	-	-	-
M1 (+ M31)	-	-	-	-	0.006	19.9	0.008	15.7
M12 (+ CM2/3)	0.033	4.1	0.091	12	-	-	-	-
M31	0.057	7.2	0.064	8.1	-	-	-	-
M32 (+ CM–1)	0.047	5.9	0.032	4.1	-	-	-	-
M32 sulfate	0.031	3.9	-	-	0.003	10.3	0.004	7.9
CM2	-	-	-	-	0.003	8.5	0.005	10.2
DHM sulfate	0.015	1.9	-	-	0.003	9.9	0.008	16.8
MHM sulfate	0.012	1.5	-	-	0.006	18.0	0.006	12.9
MHM–4	-	-	-	-	0.002	7.7	0.003	6.1
MHM (1–2 isomers)	-	-	-	-	-	-	-	-
DCM	-	-	0.073	9.3	-	-	-	-
CHM (1–4 isomers)	0.007	0.9	0.044	5.6	-	-	-	-
DHM (2 isomers) (may contain a trace of OCM)	-	-	0.017	2.1	-	-	-	-
MHM (4–6 isomers)	0.043	5.5	0.10	13	-	-	-	-
Total identified	**0.38**	**47**	**0.58**	**74**	**0.025**	**79.6**	**0.039**	**79.5**
Unidentified conjugates	0.30	38	-	-	-	-	-	-
Hexane-soluble unidentified	0.002	0.2	-	-	-	-	-	-
Unidentified precipitate from - aqueous extract	0.039	5.0	-	-	-	-	-	-
Other unidentified components (>10)	-	-	0.14	17	-	-	-	-
Acetonitrile-soluble unidentified	-	-	-	-	0.003	9.8	0.004	7.8
Water-soluble unidentified	-	-	-	-	0.001	4.0	0.003	5.9
EtOAc-soluble hydrolysate	-	-	0.021	2.7	-	-	-	-
Water-soluble hydrolysate	-	-	0.031	3.9	-	-	-	-
Total characterized	**0.34**	**44**	**0.19**	**24**	**0.004**	**13.8**	**0.007**	**13.7**
Unextracted	**0.068**	**8.6**	**0.016**	**2.0**	**0.002**	**6.6**	**0.003**	**6.8**

Components	Liver (pre-hydrolysis)		Liver (post-hydrolysis)		Breast muscle		Thigh muscle	
	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]
Total	**0.79**	**100**	**0.79**	**100**	**0.031**	**100**	**0.049**	**100**

CHM Metconazole carboxylic acid

DCM Metconazole dicarboxylic acid

DHM Di-hydroxy metconazole

MHM Mono-hydroxy metconazole

- Not applicable or not detected

Table 49 Summary of identified/characterized residues in fat, skin and egg after oral administration of 14 ppm [cyclopentyl–^{14}C]-radiolabelled metconazole for 4.5 consecutive days to laying hens

Components	Abdominal fat		Skin with fat		Egg white [a]		Egg yolk [a]		Whole egg [a]	
	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]
TRR	0.091	100	0.075	100	0.047	100	0.088	100	0.060	100
Total metconazole	0.033	37	0.021	28	0.003	7.3	0.010	11	0.006	8.6
cis-metconazole	0.017	19	0.011	14	0.001	2.1	0.004	4.4	0.002	2.8
trans-metconazole	0.016	18	0.010	13	0.002	5.2	0.006	7.1	0.004	5.8
M1	-	-	-	-	-	-	-	-	-	-
M1 (+ M31)	0.025	28	0.018	24	0.007	16	0.016	18	0.010	17
M12 (+ CM2/3)	-	-	-	-	-	-	-	-	-	-
M31	-	-	-	-	-	-	-	-	-	-
M32 (+ CM1)	-	-	-	-	-	-	-	-	-	-
M32 sulfate	0.001	1.6	0.003	3.7	0.008	17	0.007	7.9	0.008	14
CM–2	0.009	9.6	0.007	9.6	0.008	17	0.006	6.6	0.007	14
DHM sulfate	-	-	0.002	2.3	-	-	0.003	2.8	0.001	0.9
MHM sulfate	0.004	4.5	0.005	6.0	0.008	16	0.012	13	0.009	15
MHM–4	0.003	3.5	0.004	5.3	-	-	-	-	-	-
MHM (1–2 isomers)	-	-	-	-	0.003	7.1	0.007	8.4	0.005	7.5
DCM	-	-	-	-	-	-	-	-	-	-
CHM (1–4 isomers)	-	-	-	-	-	-	-	-	-	-
DHM (2 isomers) (may contain a trace of OCM)	-	-	-	-	-	-	-	-	-	-
MHM (4–6 isomers)	-	-	-	-	-	-	-	-	-	-
Total identified	**0.076**	**84**	**0.059**	**79**	**0.038**	**80**	**0.060**	**68**	**0.045**	**76**
Unidentified conjugates	-	-	-	-	-	-	-	-	-	-
Hexane-soluble unidentified	0.008	9.1	0.002	2.5	-	-	0.001	0.6	0.0002	0.2
Unidentified precipitate from -aqueous extract	-	-	-	-	-	-	-	-	-	-
Other unidentified components (>10)	-	-	-	-	-	-	-	-	-	-
Acetonitrile-soluble unidentified	0.002	1.7	0.005	6.2	0.007	16	0.009	9.7	0.008	14
Water-soluble unidentified	0.004	3.9	0.005	6.8	0.001	2.2	0.006	7.1	0.003	3.8
EtOAc-soluble hydrolysate	-	-	-	-	-	-	0.003	3.7	-	-
Water-soluble hydrolysate	-	-	-	-	-	-	0.005	5.8	-	-
Total characterized	**0.014**	**15**	**0.012**	**15.5**	**0.008**	**18**	**0.024**	**27**	**0.010**	**18**
Unextracted	**0.001**	**1.6**	**0.004**	**5.7**	**0.001**	**2.0**	**0.004**	**4.7**	**0.005**	**5.9**
Total	**0.091**	**100**	**0.075**	**100**	**0.047**	**100**	**0.088**	**100**	**0.060**	**100**

TRR Total radioactive residue (sum of ERR + RRR)

CHM Metconazole carboxylic acid

DCM Metconazole dicarboxylic acid

DHM Di-hydroxy metconazole

MHM Mono-hydroxy metconazole

[a] Analysis was done with day 4 and day 5 samples combined

- Not applicable or not detected

Table 50 Summary of identified/characterized residues in liver, muscle and abdominal fat after oral administration of 13 ppm [triazole–^{14}C]-radiolabelled metconazole for 4.5 consecutive days to laying hens

Components	Liver (post-hydrolysis)		Breast muscle		Thigh muscle		Abdominal fat	
	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]
TRR	**0.97**	**100**	**0.15**	**100**	**0.15**	**100**	**0.14**	**100**
Total metconazole	0.017	1.7	0.001	0.8	0.005	3.3	0.050	35
cis-metconazole	-	-	-	-	0.003	1.7	0.025	18
trans-metconazole	-	-	0.001	0.8	0.002	1.5	0.024	17
M1	0.094	9.7	-	-	-	-	-	-
M1 (+ M31)	-	-	0.006	3.8	0.006	4.0	0.019	13
M12 (+ CM2/3)	0.081	8.3	-	-	-	-	-	-
M20 (1,2,4-triazole)	0.27	27	0.11	77	0.11	75	0.019	13
M31	0.049	5.1	-	-	-	-	-	-
M32 (+ CM1)	0.039	4.1	-	-	-	-	-	-
M32 sulfate	-	-	0.003	2.1	0.006	3.8	0.014	9.7
CM2	-	-	0.002	1.6	0.003	1.9	0.007	5.0
DHM sulfate	-	-	0.003	1.9	0.002	1.3	0.006	4.0
MHM sulfate	-	-	0.005	3.7	0.004	2.4	0.009	6.4
MHM–4	-	-	0.002	1.4	0.002	1.5	0.004	2.6
MHM (1–2 isomers)	-	-	-	-	-	-	-	-
DCM	0.070	7.2	-	-	-	-	-	-
CHM (1–4 isomers)	0.048	4.9	-	-	-	-	-	-
DHM (2 isomers) (may contain a trace of OCM)	0.018	1.9	-	-	-	-	-	-
MHM (4–6 isomers)	0.094	9.7	-	-	-	-	-	-
OCM	0.005	0.5	-	-	-	-	-	-
Total identified	**0.78**	**80**	**0.13**	**93**	**0.14**	**93**	**0.13**	**90**
Hexane-soluble unidentified	-	-	-	-	-	-	0.011	7.8
Other unidentified components (>10)	0.12	12	-	-	-	-	-	-
Acetonitrile-soluble unidentified	-	-	0.002	1.6	0.003	1.7	0.001	0.5
Water-soluble unidentified	-	-	0.003	2.4	0.003	2.1	-	-
EtOAc-soluble hydrolysate	0.025	2.6	-	-	-	-	-	-
Water-soluble hydrolysate	0.036	3.7	-	-	-	-	-	-
Total characterized	**0.18**	**18**	**0.006**	**3.9**	**0.006**	**3.8**	**0.012**	**8.4**
Unextracted	**0.015**	**1.6**	**0.005**	**3.6**	**0.004**	**2.9**	**0.003**	**2.0**
Total	**0.97**	**100**	**0.15**	**100**	**0.15**	**100**	**0.14**	**100**

TRR Total radioactive residue (sum of ERR + RRR)

CHM Metconazole carboxylic acid

DCM Metconazole dicarboxylic acid

DHM Di-hydroxy metconazole

MHM Mono-hydroxy metconazole

- Not applicable or not detected

Table 51 Summary of identified/characterized residues in skin and egg after oral administration of 13 ppm [triazole–^{14}C]-radiolabelled metconazole for 4.5 consecutive days to laying hens

Components	Skin with fat		Egg white[1]		Egg yolk [a]		Whole egg [a]	
	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]	[mg/kg]	[% TRR]
TRR	**0.14**	**100**	**0.19**	**100**	**0.16**	**100**	**0.18**	**100**
Total metconazole	0.027	20	0.005	2.5	0.010	6.6	0.006	3.7
cis-metconazole	0.014	10	0.001	0.8	0.003	2.0	0.002	1.2
trans-metconazole	0.013	9.5	0.003	1.7	0.007	4.6	0.004	2.6
M1	-	-	-	-	-	-	-	-
M1 (+ M31)	0.015	11	0.011	6.2	0.020	13	0.014	8.2
M12 (+ CM2/3)	-	-	-	-	-	-	-	-
M20 (1,2,4-triazole)	0.064	47	0.12	65	0.067	43	0.10	58
M31	-	-	-	-	-	-	-	-
M32 (+ CM–1)	-	-	-	-	-	-	-	-
M32 sulfate	0.004	2.8	0.007	3.9	0.005	3.1	0.007	3.7
CM2	0.004	2.6	0.009	4.8	0.004	2.8	0.008	4.2
DHM sulfate	-	-	-	-	0.002	1.3	0.001	0.4
MHM sulfate	0.003	2.5	0.010	5.3	0.013	8.3	0.011	6.3
MHM4	0.003	1.9	0.005	2.5	-	-	-	-
MHM (1–2 isomers)	-	-	-	-	0.007	4.5	0.005	3.1
DCM	-	-	-	-	-	-	-	-
CHM (1–4 isomers)	-	-	-	-	-	-	-	-
DHM (2 isomers) (may contain a trace of OCM)	-	-	-	-	-	-	-	-
MHM (4–6 isomers)	-	-	-	-	-	-	-	-
OCM	-	-	-	-	-	-	-	-
Total identified	**0.12**	**87**	**0.17**	**90**	**0.13**	**82**	**0.16**	**88**
Hexane-soluble unidentified	0.002	1.3	-	-	0.000	0.2	0.0001	0.1
Other unidentified components (>10)	-	-	-	-	-	-	-	-
Acetonitrile-soluble unidentified	0.004	2.8	0.014	7.8	0.010	6.2	0.013	7.3
Water-soluble unidentified	0.007	5.1	0.003	1.6	0.007	4.2	0.004	2.4
EtOAc-soluble hydrolysate	-	-	-	-	-	-	-	-
Water-soluble hydrolysate	-	-	-	-	-	-	-	-
Total characterized	**0.013**	**9.2**	**0.018**	**9.4**	**0.017**	**11**	**0.017**	**9.7**
Unextracted	**0.005**	**4.0**	**0.001**	**0.6**	**0.011**	**7.1**	**0.004**	**2.6**
Total	**0.14**	**100**	**0.19**	**100**	**0.16**	**100**	**0.18**	**100**

TRR Total radioactive residue (sum of ERR + RRR)

CHM Metconazole carboxylic acid

DCM Metconazole dicarboxylic acid

DHM Di-hydroxy metconazole

MHM Mono-hydroxy metconazole

[a] Analysis was done with Day 4 and Day 5 samples combined

- Not applicable or not detected

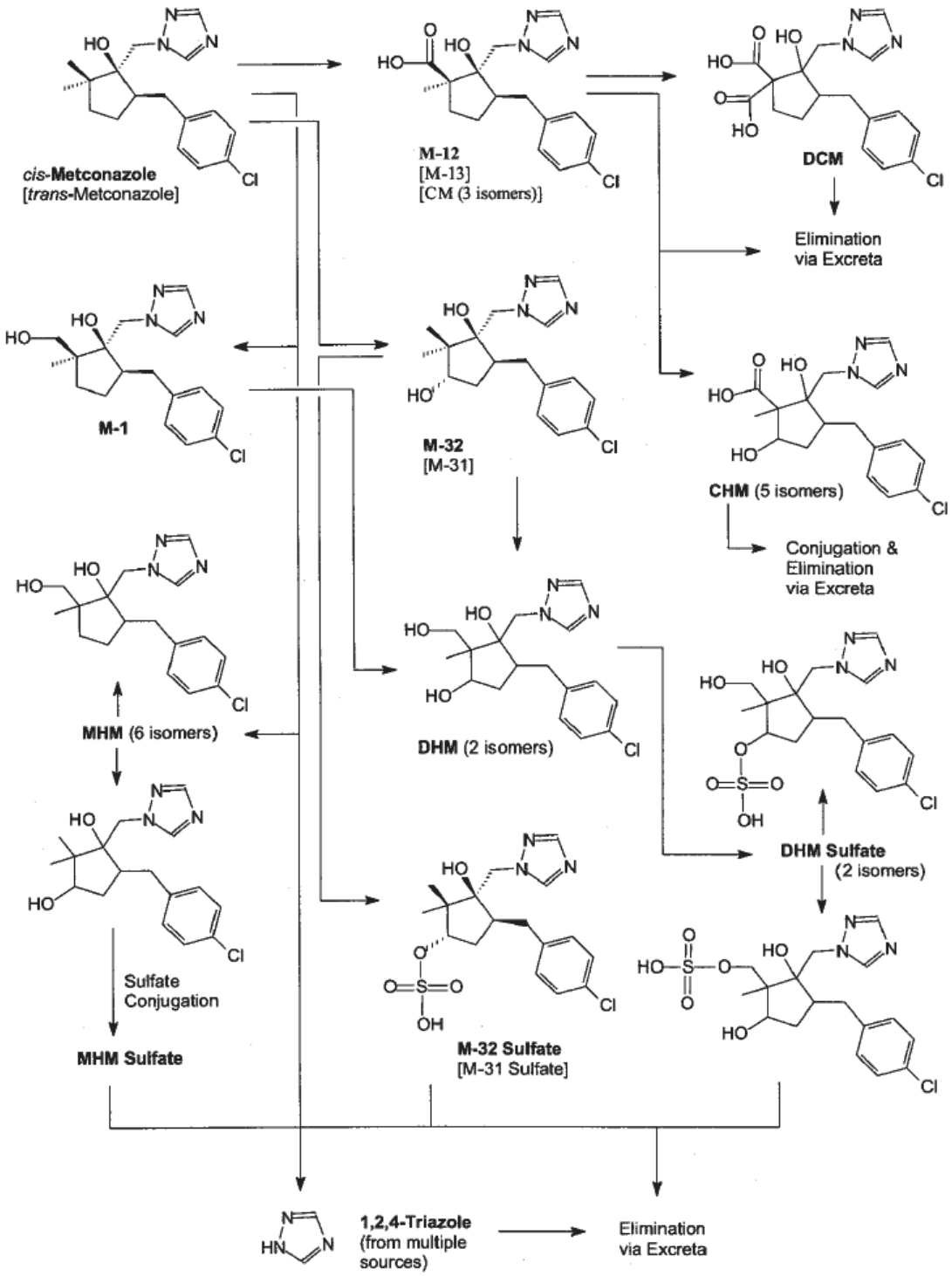


Figure 4 Proposed metabolic pathway of metconazole in laying hens

ENVIRONMENTAL FATE

For the investigation of the environmental fate of metconazole, the Meeting received studies on aerobic soil metabolism and degradation, soil and aqueous photolysis and on the behaviour in confined and field rotational crops. According to the use pattern, aqueous photolysis was not considered relevant here.

Aerobic soil degradation

The rate of degradation of metconazole was studied in one aerobic soil using [triazole–^{14}C]-radiolabelled metconazole at a nominal application rate of 0.24 mg/kg oven dry soil, corresponding to 360 g ai/ha (Gedik & Fullard, 2002, METCON_039). Soil characteristics are shown in Table 52.

Table 52 Soil characteristics

Soil Name	Texture	Soil Origin	% Organic Matter	Organic C [%]	Cation exchange capacity [meq/100g]	pH[100 mM KCl]
PT 190	Sandy loam	Ipswich, UK	2.2	1.3	11.4	6.8

The test system was maintained in the dark at a nominal temperature of 20 ± 2°C for 120 days. Volatile organics and CO_2 were trapped with ethanediol and 0.5 M NaOH, respectively. Samples were taken at 0, 3, 7, 14, 28, 56, 91 and 120 days after application.

The soil samples were extracted three times with acetonitrile/water (7/3, v/v). Extracts were analysed by LSC for total radioactivity and by HPLC or TLC against reference standards to identify metabolites. A soil subsample from 120 day after application was additionally extracted with 0.5 M NaOH. The soil remaining after the extraction was combusted followed by LSC.

Parent metconazole declined from 96% AR to 31% AR over the study time. The only identified metabolite was M30 accounting for up to 4.6% AR at day 91 (Table 53). The radioactivity in the bound residues increased over time from 1.9% AR to 39% AR. Further analysis of the bound residues at 120 days showed 26, 10, and 1% of the applied radioactivity was associated with the humin, fulvic acid and humic acid fractions, respectively.

Table 53 Biotransformation of [triazole–^{14}C]-metconazole, expressed as percentage of applied radioactivity

Degradate	Sampling time (days)							
	0	3	7	14	28	56	91	120
Metconazole	96	92	91	86	74	61	55	31
M30	n/d	n/d	n/d	n/d	3.3	6.3	6.5	11
Unidentified degradates	n/d	n/d	n/d	n/d	n/d	3.0	2.5	2.5
Total extracted radioactivity	**96**	**92**	**91**	**88**	**81**	**75**	**68**	**47**
CO_2	ns	0.14	0.21	0.34	0.77	2.1	4.9	10
Volatiles organics	nd	0.01	0.03	0.06	0.03	0.06	0.09	0.08
Unextracted	1.9	3.6	5.2	7.9	14	21	28	39
Total	**98**	**95**	**96**	**96**	**96**	**98**	**101**	**96**

Based on the decline rate observed for metconazole, a half-life of 84 days was estimated (single 1st order kinetics).

In a second study, the degradation of metconazole was investigated in one aerobic soil using [p-chlorophenyl–^{14}C]-and [triazole–^{14}C]-radiolabelled metconazole at a nominal application rate of 0.27 mg/kg dry soil, corresponding to a field application rate of 100 g ai/ha (Dalkmann & Kibat, 2015, METCON_040). Soil characteristics are shown in Table 54.

Table 54 Soil characteristics

Soil Name	Texture	Soil Origin	% Organic Matter	Organic C [%]	Cation exchange capacity [meq/100g]	pH[H_2O; CaCl]
LUFA 5 M	DIN: loamy sand USDA: sandy loam	Speyer, Germany	3.41	1.98	10.2	7.9; 7.4

Test systems were maintained in the dark at a nominal temperature of 20 ± 2°C for 119 days. Volatile organics and CO_2 were trapped with ethanediol and 0.5 mol/L NaOH, respectively. Samples were taken at 0, 3, 7, 14, 28, 43, 63, 91 and 119 days after application.

The soil samples were extracted three times with acetonitrile, followed by two times with acetonitrile/water 50:50, v/v). Extracts were analysed by LSC for total radioactivity and by (chiral) radio-HPLC against reference standards to identify metabolites. The soil remaining after extraction was combusted followed by LSC. Since the PES exceeded 10% AR in several soil samples, selected dry soil residues were further characterized by NaOH treatment.

The percentage recovery of the applied radioactivity soil is presented in Table 55. For both labels, parent metconazole declined from 97–98% to 50–51% over the study time. The ratio of the *cis*- and *trans*-isomer shifted only slightly over time (4.7 to 3.2). Trapped CO_2 was higher for [p-chlorophenyl–^{14}C]-metconazole at up to 14% AR compared to [triazole–^{14}C]-metconazole at up 1.1% AR. Identified metabolites were M20 (1,2,4-triazole) for [triazole–^{14}C]-label at up to 1.2% AR, M30 for both labels up to 3% and M40 and/or an unknown for both labels at up to 1.8% AR. The radioactivity in the bound residues for both labels increased over time from 1.0–1.2% AR to 23–42% AR. Further analysis of the bound residues showed that the sum humins, fulvic acid and humic acid increased from 9.3–14% AR at day 28 to 22–42% AR at day 119.

Table 55 Metabolism of metconazole, expressed as percentage of applied radioactivity in soil

Degradate	Sampling time (days)								
	0	3	7	14	28	43	63	91	119
[p-chlorophenyl–^{14}C]-metconazole [%AR]									
Total metconazole	97	97	94	89	85	79	72	60	51
trans-metconazole	17	17	17	16	14	14	13	13	12
cis-metconazole	80	80	77	74	70	65	58	48	39
M30	n/d	n/d	n/d	0.9	1.1	1.5	1.9	2.0	1.9
M40 and/or unknown	0.5	0.2	0.6	0.6	0.3	0.9	0.9	1.3	1.8
Unidentified degradates	n/d	n/d	n/d	0.3	0.5	0.7	1.1	1.6	2.7
Total extracted radioactivity	98	97	95	91	87	82	76	65	57
CO_2	n/d	0.3	0.6	1.3	3.0	5.3	8.4	10	14
Volatiles organics	n/d	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
Unextracted	1.0	3.9	4.5	7.0	9.2	11	15	19	23
Total	99	102	100	100	99	99	99	94	94
[triazole–^{14}C]-metconazole [%AR]									
Total metconazole	98	96	92	90	84	80	72	59	50
trans-metconazole	17	16	16	16	14	14	14	12	11
cis-metconazole	81	80	77	74	70	66	58	48	39
M20 (1,2,4-triazole)	n/d	n/d	n/d	n/d	n/d	n/d	n/d	0.9	1.2
M30	1.3	1.2	1.7	1.6	2.0	2.4	3.0	2.9	2.5
M40 and/or unknown	n/d	n/d	n/d	n/d	n/d	n/d	0.3	1.0	1.3
Unidentified degradates	n/d	n/d	n/d	0.3	n/d	n/d	n/d	1.5	2.0
Total extracted radioactivity	99	97	94	92	86	82	75	66	57
CO_2	n/d	<LOQ	<LOQ	0.1	0.2	0.3	0.5	0.8	1.1
Volatiles organics	n/d	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
Unextracted	1.2	3.8	5.7	9.0	13	18	23	31	42
Total	100	101	100	101	99	100	99	97	100

Based on the decline rate observed for metconazole, a half-life time of 128 days was estimated (single 1st order kinetics).

Soil photolysis

The soil surface photolytic behaviour of *cis*-metconazole was investigated in a loamy sand soil using [triazole–^{14}C]-radiolabelled metconazole at a nominal application rate of 5.91 mg/kg, equivalent to 5000 g ai/ha. (Baranowski & VanDijk, 1992, METCON_041). Soil characteristics are shown in Table 56.

Table 56 Soil characteristics

Soil Name	Texture	Soil Origin	Organic C [%]	Cation exchange capacity [meq/100g]	pH
LUFA 2.2	USDA: loamy sand	Speyer, Germany	2.6	10	6.0

Soil samples were prepared on glass plates (~1mm thick) and subjected to intermittent irradiation (12hours light/dark cycles) for 30 days at 22 ± 2°C using a xenon irradiation source with filters to eliminate wavelengths of < 290 nm. Dark control samples were prepared in parallel. Volatile organics and CO_2 were trapped with ethanediol and 2 mol/L NaOH, respectively. The irradiated soil samples were analysed at 0, 2, 4, 8, 16 and 30 days.

The soil samples were extracted once with acetonitrile, followed by two times with acetonitrile/water (8/2, v/v). Additionally samples were extracted exhaustive with acetonitrile by refluxing overnight. Extracts were analysed by LSC and HPLC/TLC to determine the radioactivity and metabolite pattern, respectively. The soil remaining after extraction was combusted followed by LSC.

The percentage recovery of the applied radioactivity in moist soil is presented in Table . Parent metconazole declined from 96% to 70% over the irradiation time. At the same time, the sum of unidentified degradates, radioactivity released under enhanced condition and unextracted radioactivity increased from 2.5% to 21%.

Table 57 Phototransformation of [triazole–^{14}C]-metconazole, expressed as percentage of applied radioactivity, on moist irradiated soil samples

Degradate	Incubation period [days]						Dark controls
	0	2	4	8	16	30	
[triazole–^{14}C]-metconazole [%AR]							
cis-metconazole	96	91	89	89	74	70	88–100
Unidentified degradates [a]	n/a	1.6	1.3	3.1	4.5	5.8	0.6–1.5
Total extracted radioactivity	96	93	90	92	79	76	89–102
Extracted (80 °C)	2.0	4.5	3.5	2.7	2.8	7.6	2.0–4.0
CO_2	n/a	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
Volatiles organics	n/a	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
Unextracted	0.5	1.4	3.5	6.7	9.7	7.8	0.5–2.0
Total	99	98	97	101	91	92	93–106

[a] No individual unidentified component accounts for >5% AR

Based on the decline rate observed for metconazole, a half-life time of 63 days under intermittent irradiation was estimated (single 1st order kinetics) for soil.

In a second study, the soil surface photolytic behaviour of metconazole, containing a *cis:trans* ratio of 85:15, was investigated in a loamy sand soil using [triazole–^{14}C]-radiolabelled metconazole at a nominal application rate of approximately 90 g/ha (Bissinger, 1996, METCON_042). Soil characteristics are shown in Table 58.

Table 58 Soil characteristics

Soil Name	Texture	Soil Origin	Organic C [%]	Cation exchange capacity [meq/100g]	pH
LUFA 2.2	USDA: loamy sand	Speyer, Germany	2.3	11	5.6

Soil samples were prepared on glass plates (~1mm thick) and subjected to continuous irradiation for 15 days at 20 ± 3°C using a xenon irradiation source with filters to eliminate wavelengths of <290 nm. Dark control samples were prepared in parallel. Volatile organics and CO_2 were trapped with ethanediol and 2 mol/L NaOH, respectively. The irradiated soil samples were analysed at 0, 1, 2, 4, 7, 10 and 15 days.

The day 0 soil samples were extracted twice with acetone and once with methanol while day 1 soil samples were extracted with methanol only. All other samples were extracted twice with methanol and once with water. Extracts were analysed by LSC and TLC to determine the radioactivity and metabolite pattern, respectively. The soil remaining after extraction was combusted followed by LSC.

The percentage recovery of the applied radioactivity in moist soil is presented in Table 59. Parent metconazole declined from 91% to 57% over the irradiation time. No distinct metabolites could be identified. Up to 32% AR accounted for unresolved background on TLC plates.

Table 59 Phototransformation of [triazole–^{14}C]-metconazole (*cis:trans* ratio: 85:15), expressed as percentage of applied radioactivity, on moist irradiated soil samples

Degradate	Incubation period [days]							Dark controls
	0	1	2	4	7	10	15	
[triazole–^{14}C]-metconazole [%AR]								
Metconazole	91	78	73	67	60	57	57	82–93
Unidentified degradates [a]	<LOQ	<LOQ	9.5	11	8.6	11	12	n/d
Unresolved background [b]	9.1	22	17	23	32	32	31	7.4–19
Total extracted radioactivity	98	93	95	94	93	86	88	98–101
CO_2	<LOQ	<LOQ	0.1	0.1	0.2	0.6	1.0	n/d
Volatiles organics	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	
Unextracted	0.8	7.4	4.9	5.2	6.3	7.5	9.0	0.8–1.8
Total	99	100	100	99	100	94	98	98–102

[a] No individual unidentified component accounts for >6.7% AR

[b] Unresolved background on TLC plates

Based on the decline rate observed for metconazole, a half-life time of 36 days of continuous irradiation (equal to 73 days under the assumption of average daylight of 12 hours) was estimated (square root 2nd order kinetics) for soil.

In a third study, the soil surface photolytic behaviour of metconazole containing a *cis:trans* ratio of approximately 82:18 was investigated in a loamy sand soil using [p-chlorophenyl–^{14}C]-and [triazole–^{14}C]-radiolabelled metconazole at a nominal application rate of 0.6 mg/kg (90 g ai/ha) (Knight, 2015, METCON_043). Soil characteristics are shown in Table 60.

Table 60 Soil characteristics

Soil Name	Texture	Soil Origin	Organic C [%]	Cation exchange capacity [meq/100g]	pH in 0.01M $CaCl_2$
LUFA 5 M	DIN: loamy sand USDA: sandy loam	Speyer, Germany	0.98	16	7.3

Soil samples were prepared on glass dishes (~1 cm thick) and subjected to continuous irradiation for 15 days (equivalent to 31 days of natural sunlight) at 22 ± 1°C using a xenon irradiation source with filters to eliminate wavelengths of < 290 nm. Dark control samples were prepared in parallel. Volatile organics and CO_2 were trapped with ethanediol and 1 M KOH, respectively. Soil samples were taken at 0, 2, 5, 8, 10, 13 and 15 days after treatment.

The soil samples were extracted three times with acetonitrile, followed by up to three times with acetonitrile/water (1/1, v/v). Samples with non-extracted radioactivity greater than 5% were additionally extracted with 0.5M NaOH. Extracts analysed by LSC and HPLC to determine the radioactivity and metabolite pattern, respectively. Selected irradiated and dark control samples were additionally analysed by TLC for co-chromatography with reference standards and by LC-MS for confirmation of parent. The soil remaining after extraction was combusted followed by LSC.

For both labels, parent metconazole declined from 97–99% to 85–89% over the study time. The only identified metabolite was M30 at up to 3.7% AR in irradiated soil and 3.4% AR in dark soil indicating only a small influence on the degradation of metconazole. The ratio of the *cis*- and *trans*-isomer remained constant over time. Further analysis of the bound residues was mainly associated with humins, fulvic acid and humic acid ranging between 1.9–7.7% AR, 1.2–5.1% AR and 0.5–1.4% AR, respectively.

Table 61 Phototransformation of [p-chlorophenyl–^{14}C]-and [triazole–^{14}C]-radiolabelled metconazole, expressed as percentage of applied radioactivity, on moist irradiated soil samples.

Degradate	Incubation period [days]						Dark controls
	2	5	8	10	13	15	
[p-chlorophenyl–^{14}C]-metconazole [%AR]							
Total metconazole	99	94	90	93	87	85	94–102
trans-metconazole	19	15	18	17	17	16	16–20
cis-metconazole	80	79	72	76	70	69	76–83
M30	n/d	0.7	1.0	1.0	3.5	2.5	n/d–2.2
Unidentified degradates [a]	n/d	0.8	3.3	1.3	3.9	6.3	n/d–0.7
Total extracted radioactivity	99	95	94	95	95	94	94–102
CO_2	0.7	1.2	1.8	2.7	2.9	1.5	0.1–0.2
Volatiles organics	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
Unextracted	2.2	5.1	4.7	6.5	6.4	7.4	0.5–5.2
Total	102	101	101	104	104	103	98–105
[triazole–^{14}C]-metconazole [%AR]							
Total metconazole	97	93	93	91	90	89	91–103
trans-metconazole	16	17	14	16	17	16	14–19
cis-metconazole	81	76	79	75	74	73	74–85
M30	1.8	2.0	3.7	3.7	1.5	2.3	n/d–3.4
Unidentified degradates [a]	n/d	1.2	n/d	1.1	n/d	2.4	n/d
Total extracted radioactivity	98	96	97	96	92	93	91–103
CO_2	n/d	0.2	0.3	0.4	1.8	0.8	n/d–0.1
Volatiles organics	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ	<LOQ
Unextracted	4.4	4.7	7.3	5.8	8.8	9.0	0.9–9.8
Total	103	101	104	102	102	103	97–107

[a] No individual unidentified component accounts for >5% AR

Based on the decline rate observed for metconazole, a half-life time of 68 days of continuous irradiation was estimated (single 1st order kinetics) for soil.

Confined rotational crops

A confined rotational crop study was conducted with [cyclopentyl–^{14}C]- and [triazole–^{14}C]-radiolabelled metconazole (*cis:trans* ratio of about 80:20), each applied at a rate of 0.4 kg ai/ha to a sandy loam soil (Hill & Standen, 1993, METCON_044). After plant-back intervals (PBIs) of 30 and 120 days, the nature and level of radioactive residues were investigated in lettuce (variety Bellona),

radish (variety Cherry Belle) and wheat (variety Axona). Immature and mature crops were harvested from the 30 day PBI, while only mature crops were harvested from the 120 day PBI.

Homogenized plant samples were combusted prior to the determination of total radioactivity by LSC, while liquid samples such as extracts were directly measured by LSC. Soil samples were extracted with acetonitrile/water (7+3, v/v). In order to characterize and identify the radioactivity present, all samples were extracted with acetonitrile/water at various ratios and water. Subsequently the extracts were partitioned with ethyl acetate, dichloromethane or hexane. Conjugates present in the extracts were hydrolysed by either acid (2 mol/L HCl) or base hydrolysis (0.1 M NaOH). HPLC, TLC, LC-MS and GC-MS were applied for the characterisation and identification of the radioactivity.

Residues in soils samples decrease for both labels from 82–99% TRR at DAT 0 to 67–68 % TRR at the last sampling time point at 323 DAT (Table 62).

Table 62 Percentage of radioactive residues in soil samples

Soil sample (Event)	[cyclopentyl–^{14}C]-metconazole % TRR	[triazole–^{14}C]-metconazole % TRR
0 DAT	99	82
30 DAT (1st PBI)	99	92
64 DAT (harvest immature lettuce, radish)	89	81
99 DAT (harvest mature radish)	93	91
100 DAT (harvest mature lettuce)	93	77
120 DAT (2nd PBI)	87–93	81–85
122 DAT (harvest immature wheat, 1st PBI)	93	93
189 DAT (harvest mature radish, 2nd PBI)	76	84
204 DAT (harvest mature lettuce, 2nd PBI)	73	74
323 DAT (harvest immature wheat, 2nd PBI)	68	67

Radioactivity for the both labels in all matrices was comparable, with the exception of wheat grain where the TRR for the [triazole–^{14}C]-label was significantly higher. TRR levels were highest in wheat root, followed by wheat straw. At 120 days PBI, the measured TRR was often at similar or higher levels compared to the 30 day PBI (e.g. mature radish root and top or lettuce leaf) while only in immature lettuce levels dropped significantly. A summary of all TRRs found is presented in Table 63.

Table 63 Total radioactive residues in rotational crops after application of [cyclopentyl–^{14}C]- and [triazole–^{14}C]-radiolabelled metconazole to bare soil at 0.4 kg ai/ha.

Plant back interval	Sampling at days after sowing/planting	TRR, mg eq/kg	
		[cyclopentyl–^{14}C]-metconazole	[triazole–^{14}C]-metconazole
Immature radish			
30 DAT	34	0.24	0.31
120 DAT	n/a	0.19	0.14
Immature lettuce			
30 DAT	34	0.13	0.13
120 DAT	n/a	0.04	0.06
Immature wheat (foliage)			
30 DAT	92	0.15	0.12
120 DAT	n/a	0.13	0.20
Immature wheat (root)			
30 DAT	92	0.35	0.29
120 DAT	n/a	0.25	0.30
Radish top			
30 DAT	69	0.40	0.65
120 DAT	69	0.68	0.84
Radish root			
30 DAT	69	0.32	0.38
120 DAT	69	0.37	0.71
Lettuce leaf			

Plant back interval	Sampling at days after sowing/planting	TRR, mg eq/kg	
		[cyclopentyl–^{14}C]-metconazole	[triazole–^{14}C]-metconazole
30 DAT	70	0.03	0.08
120 DAT	84	0.10	0.20
Lettuce root			
30 DAT	70	0.36	0.50
120 DAT	84	0.63	0.62
Wheat grain			
30 DAT	175	0.01	0.35
120 DAT	203	0.01	0.49
Wheat chaff			
30 DAT	175	0.17	0.28
120 DAT	203	0.15	0.32
Wheat straw			
30 DAT	175	0.73	0.61
120 DAT	203	0.70	0.73
Wheat root			
30 DAT	175	0.90	0.85
120 DAT	203	0.65	0.78

The radioactivity found in the fractions from the initial acetonitrile/water and water extractions and in the unextracted remainder is presented in Table 64. At least 84% TRR or more was extracted from all crops at both PBIs.

Table 64 Extractability of radioactive residues from rotational crops after application of [cyclopentyl–^{14}C]- and [triazole–^{14}C]-radiolabelled metconazole to bare soil at 0.4 kg ai/ha

Plant back interval	TRR mg/kg	Acetonitrile/water extract		Water extract		ERR [a]		Post extraction solids	
		mg eq/kg	% TRR	mg eq/kg	% TRR	mg eq/kg	% TRR	mg eq/kg	% TRR
[cyclopentyl–^{14}C]-metconazole									
Radish root									
30 DAT	0.32	0.26	81	< 0.01	2.5	0.27	84	0.05	16
Radish top									
30 DAT	0.40	0.38	94	< 0.01	1.0	0.38	95	0.02	5.1
Lettuce									
120 DAT	0.10	0.07	73	0.01	11	0.08	84	0.02	16
Wheat straw									
120 DAT	0.70	0.62	89	0.01	1.7	0.63	91	0.07	9.3
[triazole–^{14}C]-metconazole									
Radish root									
30 DAT	0.38	0.34	89	< 0.01	1.4	0.34	90	0.04	10
120 DAT	0.71	0.60	84	0.04	6.2	0.64	90	0.07	9.8
Radish top									
30 DAT	0.65	0.61	94	0.01	2.0	0.62	95	0.03	4.6
120 DAT	0.84	0.74	88	0.03	4.0	0.77	92	0.07	8.2
Lettuce									
30 DAT	0.08	0.07	92	< 0.01	2.4	0.08	94	< 0.01	6.0
120 DAT	0.20	0.15	75	0.03	17	0.18	92	0.02	8.5
Wheat straw									
30 DAT	0.61	0.55	89	< 0.01	1.1	0.55	90	0.06	9.6
120 DAT	0.73	0.64	89	0.015	2.1	0.66	91	0.07	9.3
Wheat grain									
30 DAT	0.35	0.30	85	0.04	12	0.34	97	0.01	3.0
120 DAT	0.49	0.41	83	0.07	14	0.48	97	0.01	2.7

[a] Extracted radioactive residues: sum of acetonitrile/water and water extracts

The results of the identification and characterization of radioactive residues are presented in Table 65. Parent metconazole was identified as the major component for radish roots and tops at 30 day PBI at up to 41% TRR (0.13 mg eq/kg) and in lettuce at 120 day PBI at 20% TRR

(0.02 mg eq/kg). Metconazole was also a major residue in radish from 120 day PBI and lettuce and wheat straw from 30 day PBI, but could not be unequivocally identified due to interference.

As major metabolites, M12 was detected in 30 day PBI radish tops at up to 14% TRR (0.09 mg eq/kg), M35 (triazolyl alanine) in radish roots, top and wheat grain at up to 59% TRR (0.29 mg eq/kg) and M34 (triazolyl acetic acid) in wheat grain at up to 20% TRR (0.10 mg eq/kg). Additionally, glycoside conjugates were identified at amounts >10% TRR in wheat straw (120 day PBI). Other identified metabolites were M30 and other 'keto' metabolites present in radish roots, tops and also in wheat straw.

Table 65 The nature of metconazole-derived residues in mature succeeding crops after treatment with [cyclopentyl–^{14}C]- and [triazole–^{14}C]-radiolabelled metconazole at 0.4 kg ai/ha

Crop	Tissue	Metabolite	mg eq/kg (% TRR)			
			[triazole–^{14}C]		[cyclopentyl–^{14}C]	
			30 DAT	120 DAT	30 DAT	120 DAT
Radish	Root	**TRR**	**0.38 (100)**	**0.71 (100)**	**0.32 (100)**	**0.37 (100)**
		Metconazole	0.11 (29)	0.11 (16)*	0.13 (41)	not determined
		M30	0.01 (2.6)	0.01 (1.4)*	0.02 (6.3)	not determined
		Keto-metconazole	0.01 (2.6)	0.04 (5.6)*	0.02 (6.3)	not determined
		Glycoside conjugates	0.02 (5.3)		0.02 (6.3)	not determined
		M12	0.01 (2.6)		0.02 (6.3)	not determined
		M35 (triazolyl alanine)	0.07 (18)	0.33? (47)*		not determined
Radish	Top	**TRR**	**0.65 (100)**	**0.84 (100)**	**0.40 (100)**	**0.68 (100)**
		Metconazole	0.10 (15)	0.09 (11)*	0.07 (18)	not determined
		M30	0.02 (3.1)	0.02 (2.4)*	0.02 (5.0)	not determined
		Keto-metconazole	0.03 (4.6)	0.06 (7.1)*	0.04 (10)	not determined
		Glycoside conjugates	0.06 (9.2)			not determined
		M12	0.09 (14)			not determined
		M35 (triazolyl alanine)	0.20 (31)	0.28 (33)*		not determined
Lettuce	Leaf	**TRR**	**0.08 (100)**	**0.20 (100)**	**0.03 (100)**	**0.10 (100)**
		Metconazole	0.01 (13)*	0.01 (5.0)	not determined	0.02 (20)
		Free acids	n/d	0.03 (15)	not determined	0.02 (20)
		Triazolyl conjugates?	n/d	0.12 (60)	not determined	n/d
		M35 (triazolyl alanine)	0.02? (25)*		not determined	n/d
Wheat	Straw	**TRR**	**0.61 (100)**	**0.73 (100)**	**0.73 (100)**	**0.70 (100)**
		Metconazole	0.07 (12)*	0.03 (4.1)	not determined	0.03 (4.3)
		M30	0.03 (4.9)*	0.03 (4.1)	not determined	0.04 (5.7)
		Free acids	n/d	0.04 (5.5)	not determined	0.08 (11)
		Glycoside conjugates	n/d	0.13 (18)	not determined	0.12 (17)
	Grain	**TRR**	**0.35 (100)**	**0.49 (100)**	**0.01 (100)**	**0.01 (100)**
		M35 (triazolyl alanine)	0.13 (37)*	0.29 (59)	not determined	not determined
		M34 (triazolyl acetic acid)	n/d	0.10 (20)	not determined	not determined

* Identity is proposed by inference from similar HPLC retention time or TLC Rf values and is not confirmed by co-chromatography.

Field rotational crop studies

In two field trial conducted during 1995 in Germany, metconazole was applied twice to bare soil a rate of 0.09 kg ai/ha with an interval of 21 days (Memmesheimer, 1996, METCON_045). Carrots (variety Napoli F1) and lamb's lettuce (variety Rosetty) were planted 30–31 DALA while winter wheat (variety Rektor) was planted 98–99 DALA. Carrots and lamb's lettuce were sampled at the earliest time the crop could be commercially used and at maturity. Winter wheat was sampled immature (whole plant, ears and rest of plant) and at maturity (grain and straw).

Homogenized plant samples were extracted with acetone/hexane (1+1, v/v), followed by liquid-liquid portioning with ethyl acetate and clean-up by gel permeation chromatography, according to methods FAMS 050-01 and FAMS 057-01. Quantification was performed by GC-NPD with a LOQ of 0.01 mg/kg, with the exception of wheat straw with an LOQ of 0.03 mg/kg. Procedural recoveries

spiked at 0.03, 0 30 and 3.0 mg/kg for wheat straw and 0.01, 0.10 and 1.0 mg/kg for all other matrices ranged for both isomers between 66–110%.

The results of the field rotational crop study are provided in Table 66. In general, residues of metconazole in crops planted at 30/31 days (carrot and lamb's lettuce) and 99 days (winter wheat) after treatment of the soil were not detectable.

Table 66 Residues in rotational crops grown in metconazole-treated soil (2×0.09 kg ai/ha)

Trial/ Location	Crop	Sample	DAT	BBCH	Sum of *cis*- and *trans* metconazole (mg(kg)
95-094-01 Mutterstadt, Germany	Carrot (31 day PBI)	Root	97	41	< 0.01
		Root	128	46/47	n/d
		Root	142	49	n/d
	Lamb's lettuce (31 day PBI)	Lettuce leaf	108	49	n/d
	Lamb's lettuce (88 day PBI)	Lettuce leaf	155	14–16	n/d
	Wheat (99 day PBI)	Whole plant	336	32	n/d
		Ears	381	73–75	n/d
		Rest of plant	381	73–75	n/d
		Grain	416	92	n/d
		Straw	416	92	n/d
95-094-02 Schwabenheim, Germany	Carrot (30 day PBI)	Root	90	41	n/d
		Root	107	45	n/d
		Root	143	49	n/d
	Lamb's lettuce (30 day PBI)	Lettuce leaf	94	19	n/d
		Lettuce leaf	101	47	n/d
		Lettuce leaf	111	49	n/d
	Wheat (99 day PBI)	Whole plant	310	31	n/d
		Ears	378	77	n/d
		Rest of plant	378	77	n/d
		Grain	415	92	n/d
		Straw	415	92	n/d

n/d: not detectable, 0.003 mg/kg for carrots, lamb's lettuce, wheat grain, ears, plants and 0.01 mg/kg for wheat straw

METHODS OF RESIDUE ANALYSIS

Analytical methods

For the analysis of metconazole and metabolites in various plant and animal matrices, analytical methods suitable for enforcement and data generation purposes were submitted. In the following table an overview of these methods is presented.

Table 67 Overview of analytical methods for metconazole and metabolites

Method	Matrix	Extraction	Clean-Up	Analyte, Detection, LOQ
FAMS 050-01	Cereal grain, straw and plant	Acetone/hexane (1+1, v/v)	Partitioning with ethyl acetate, GPC	GC-NPD Confirmation: GC-MS ILV available LOQ: wheat grain: 0.03 mg/kg (per isomer); all others: 0.01 mg/kg (per isomer)
	Cereal grain, ears, straw and plant	Acetone/hexane (1+1, v/v)	Partitioning with ethyl acetate, GPC	LC-MS/MS, ESI+, m/z 320→125 LOQ: 0.01 mg/kg (per isomer)
FAMS 059-01 FAMS 059-02	Rape seed and oil	Acetonitrile	Partitioning with ethyl acetate, GPC	GC-NPD Confirmation: GC-MS LOQ: 0.01 mg/kg (per isomer)

Method	Matrix	Extraction	Clean-Up	Analyte, Detection, LOQ
FAMS 069-01	Dry pea seed, pea straw	Acetone/hexane (1+1, v/v)	Partitioning with ethyl acetate, GPC	GC-NPD Confirmation: GC-MS LOQ: pea seed: 0.01 mg/kg (per isomer); pea straw: 0.03 mg/kg (per isomer)
M 2722	Whole banana and pulp	1 mol/L HCl	Partitioning with dichloromethane, GPC	GC-NPD ILV available LOQ: 0.05 mg/kg (per isomer)
BASF method 550/0 (L0019/01)	Cereal forage, cereal grain, cereal straw, oilseed rape Seed, lemon fruit, pea seed, tomato fruit	Methanol/water/2 mol/L HCl (70+25+5, v/v/v)	Partitioning with dichloromethane	LC-MS/MS, ESI+, m/z 320→70 LOQ: 0.005 mg/kg (per isomer)
RM–41C–1	Peach, blueberry, dry bean, sunflower seed, meal and oil	Acetonitrile/water (7+3, v/v)	Partitioning with hexane, partitioning with acetonitrile, SPE on C18	GC-NPD ILV available LOQ: 0.02 mg/kg (per isomer)
RM–41C–2–1	Dry bean	Acetonitrile/water (7+3, v/v)	Partitioning with hexane/ethyl acetate (9+1, v/v), SPE on Oasis HLB	LC-MS/MS, ESI+, m/z 320→125, 320→70 LOQ: 0.02 mg/kg (per isomer)
RM–41C–2 & RM–41C–3	Straw, turfgrass	Acetonitrile/water (7+3, v/v)	Partitioning with hexane/ethyl acetate (9+1, v/v), partitioning with acetonitrile/ hexane, SPE on C18	LC-MS/MS, ESI+, m/z 320→125 (metconazole), m/z 336→125 (M11/M21), m/z 334→139 (M30) LOQ: 0.02 mg/kg
DFG S 19	Wheat grain and straw, grapes, dry pea, rape seed	Acetone/water (2+1, v/v)	Partitioning with ethyl acetate/cyclohexane (1+1, v/v), GPC	GC-NPD Confirmation by different column LOQ: wheat straw: 0.03 mg/kg (per isomer); all others: 0.01 mg/kg (per isomer)
	Apple, grapes, wheat grain, dry pea, rape seed			LC-MS/MS, m/z 320→125, 320→70 ILV available LOQ: 0.005 mg/kg (per isomer)
POP-PA.0223 (R-AR–844-05)	Soya bean seeds	Acetone/hexane (1:1; v/v)	SPE on SCX	GC-NPD LOQ: 0.01 mg/kg
D0604	Maize grain and stover, cotton seed and by-products	Acetonitrile/water (7+3; v/v)	Partitioning with hexane/ethyl acetate or hexane, SPE on SCX	HPLC-MS/MS m/z 320→70 (metconazole), m/z 336→125 (M11), m/z 336→125 (M21), m/z 334→111 (M30), m/z 70→43 (T), m/z 157→88 (TA), m/z 128→70 (TAA) LOQ: Metconazole: 0.005 mg/kg M11, M21, M30: 0.01 mg/kg, T, TA, TAA: 0.01 or 0.05 mg/kg
01062/M004	Tomato, cucumber, lettuce, cereal grain, cereal straw, cereal green plant, orange, oilseed rape seed, melon	Methanol/water (4+1; v/v)	Dispersive SPE with C18	HPLC-MS/MS m/z 70→43 (T), m/z 157→70 (TA), m/z 128→70 (TAA), m/z 158→70 (TLA) LOQ: 0.01 mg/kg

Method	Matrix	Extraction	Clean-Up	Analyte, Detection, LOQ
	peel, melon fruit, melon pulp, sweet pepper, dry bean seed, carrot leaf, carrot root			
Method 535/1 (L0076/01)	Wheat plant without root, wheat grain, wheat straw, lemon fruit, lettuce, oilseed rape seed, tomato, onion bulb	Methanol/water /2 mol/L HCl (70+25+5, v/v/v)	Partitioning with cyclohexane	LC-MS/MS, m/z 320→125, 320→70 LOQ: 0.01 mg/kg
Method Meth–160	Canola seed, canola oil	Methanol/water (4+1; v/v)	SPE	HPLC-MS/MS m/z 303→170 (T), m/z 409→70 (TA), m/z 184→70 (TAA) LOQ: 0.01 mg/kg
SOP-PA.0206 (based on MR0007)	Garlic, onion	Methanol	Partitioning with dichloromethane, SPE on Si-cartridge	GC-NPD LOQ: 0.01 mg/kg
DFG S 19	Milk, muscle, egg, fat	Acetone/water (2+1, v/v)	Partitioning with ethyl acetate/cyclohexane (1+1, v/v), GPC	GC-NPD Confirmation by different column ILV available LOQ: 0.01 mg/kg (per isomer)
	Milk, muscle, egg, fat, liver, kidney			LC-MS/MS, m/z 320→125, 320→70 ILV available LOQ: 0.005 mg/kg (per isomer)
RM–41M–1 (L0408/01)	Milk	Ethyl acetate/methanol (2+1, v/v)	Partitioning with dichloromethane/aqueous sodium chloride solution, partitioning with acetonitrile/hexane	GC-NPD Confirmation by LC-MS/MS LOQ: 0.02 mg/kg (per isomer)
	Milk, cream			LC-MS/MS, m/z 320→125, 320→70 LOQ: 0.02 mg/kg (per isomer)
RM–41M–2 (L0408/02)	Muscle, egg, fat, liver, kidney	Acetonitrile	Partitioning with hexane/ethyl acetate/aqueous sodium chloride solution, SPE on C18	LC-MS/MS, m/z 320→125, 320→70 LOQ: 0.02 mg/kg (per isomer)
RM–41M–3	Kidney	Methanol, followed by methanol/water (9+1, v/v)	Partitioning with hexane, M12: SPE on C18 M1: hydrolysis with 3 mol/L HCl, SPE on C18	LC-MS/MS, m/z 336→125 (M1), m/z 350→125 (M12) LOQ: 0.02 mg/kg
RM–41M–3a	Liver, kidney, fat, muscle	Methanol/water (9+1, v/v)	Partitioning with hexane, SPE on C18	LC-MS/MS, m/z 336→125, 336→70 (M1), m/z 350→125, 350→70 (M12) LOQ: 0.02 mg/kg
L0415/01	Liver, fat, muscle, egg	Methanol/water (8+2, v/v)	Derivatization with dansyl chloride, partitioning with ethyl acetate	LC-MS/MS, m/z 304→171, 304→182 (1,2,4 triazole) LOQ: 0.01 mg/kg

Plant materials

FAMS 050-01

The homogenized sample material was extracted with acetone/hexane (1+1, v/v), followed by centrifugation. After filtration through quartz wool, water and sodium chloride was added and the extract partitioned twice against ethyl acetate. The organic extracts were combined, evaporated to dryness and the remainder reconstituted in methanol. Further clean-up was carried out by GPC with methanol as eluent.

Final determination of metconazole was done by GC-NPD using a DB–5 column and by GC-MS for confirmation. Quantitation was done with external standards in ethyl acetate.

Table 68 Recovery data for method FAMS 050-01 measuring metconazole in cereal grain and straw using GC-NPD.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Wheat grain	0.01	11	87	6.9	Memmesheimer, 1996, METCON_046 Memmesheimer, 1996, METCON_047
		0.10	11	81	5.7	
		1.0	9	80	5.9	
	Barley grain	0.01	4	84	9.0	
		0.10	4	78	2.2	
		1.0	4	75	1.3	
	Rye grain	0.01	1	79	-	
		0.10	1	73	-	
		1.0	1	76	-	
	Triticale grain	0.01	1	92	-	
		0.10	1	84	-	
		1.0	1	82	-	
	Wheat straw	0.03	11	88	15	
		0.30	9	80	6.2	
		3.0	13	81	14	
	Barley straw	0.03	3	89	17	
		0.30	4	77	7.7	
		3.0	4	75	3.8	
	Rye straw	0.03	1	86	-	
		0.30	1	78	-	
		3.0	1	75	-	
	Triticale straw	0.03	1	105	-	
		0.30	1	88	-	
		3.0	1	82	-	
trans-Metconazole	Wheat grain	0.01	11	89	9.8	
		0.10	11	82	4.7	
		1.0	9	80	5.8	
	Barley grain	0.01	4	88	12	
		0.10	4	78	2.9	
		1.0	4	75	1.1	
	Rye grain	0.01	1	89	-	
		0.10	1	75	-	
		1.0	1	75	-	
	Triticale grain	0.01	1	100	-	
		0.10	1	84	-	
		1.0	1	81	-	
	Wheat straw	0.03	11	94	14	
		0.30	9	79	6.7	
		3.0	13	82	15	
	Barley straw	0.03	4	96	13	
		0.30	4	75	12	

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
		3.0	4	76	4.5	
	Rye straw	0.03	1	87	-	
		0.30	1	77	-	
		3.0	1	73	-	
	Triticale straw	0.03	1	99	-	
		0.30	1	87	-	
		3.0	1	82	-	

Table 69 Confirmatory recovery data for method FAMS 050-01 measuring metconazole in cereal grain and straw using GC-MS.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Wheat grain	0.01	3	100	5.6	Memmesheimer, 1996, METCON_046
		0.10	3	95	5.2	
		1.0	3	80	2.2	
	Wheat straw	0.03	3	105	4.4	
		0.30	3	84	1.4	
		3.0	3	80	1.4	
trans-Metconazole	Wheat grain	0.01	3	96	9.5	Memmesheimer, 1996, METCON_047
		0.10	3	95	4.4	
		1.0	3	82	2.1	
	Wheat straw	0.03	3	100	4.0	
		0.30	3	96	0.6	
		3.0	3	79	1.9	

Independent laboratory validation of method FAMS 050-01:

The sample extraction, clean-up and method of determination were identical to FAMS 050-01.

Table 70 Recovery data for the ILV of FAMS 050-01 measuring metconazole in cereal matrices

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Whole plant	0.01	2	103	-	Weeren, 1996, METCON_048
		1.0	2	84	-	
	Ears	0.01	2	102	-	
		1.0	2	88	-	
	Rest plant	0.01	2	97	-	
		1.0	2	74	-	
	Grain	0.01	2	84	-	
		0.10	2	82	-	
	Straw	0.03	2	74	-	
		3.0	4	94	7.8	
trans-Metconazole	Whole plant	0.01	2	108	-	
		1.0	2	82	-	
	Ears	0.01	2	88	-	
		1.0	2	91	-	
	Rest plant	0.01	2	93	-	
		1.0	2	74	-	
	Grain	0.01	2	78	-	
		0.10	2	83	-	
	Straw	0.03	2	113	-	

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
		3.0	4	95	9.0	

FAMS 050-01 (using LC-MS/MS)

Sample extraction and clean-up was identical to method FAMS 059-01, but quantification was done by LC-MS/MS in positive ionization mode using a Phenomenex Aqua C18 column and monitoring the ion transition m/z 320→125.

Table 71 Recovery data for method FAMS 050-01 measuring metconazole in cereal matrices using LC-MS/MS.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
Metconazole	Barley whole plant	0.01	4	81	3	Perny, 2004, METCON_058 Perny, 2004, METCON_059
		0.1	1	81	-	
		0.5	2	92	-	
		5.0	2	97	-	
	Straw	0.01	4	79	1.6	
		0.1	2	87	-	
		5.0	2	91	-	
	Rest of plant	0.01	2	74	-	
		0.1	1	71	-	
		5.0	2	98	-	
	Grain	0.01	4	87	11	
		0.1	2	93	-	
	Ears	0.01	2	80	-	
		0.1	1	93	-	
		1.0	2	102	-	

FAMS 059-01 & FAMS 059-02

Rape seeds were homogenized with acetonitrile, followed by centrifugation and filtration through quartz wool. Rape oil was dissolved in hexane followed by liquid-liquid extraction using acetonitrile. After addition of water, the acetonitrile phases of both matrices were partitioned against ethyl acetate. The organic extracts were combined, evaporated to dryness and the remainder reconstituted in methanol. Further clean-up was carried out by GPC with methanol as eluent.

Final determination of metconazole was done by GC-NPD using a DB–5 column and by GC-MS for confirmation. Quantitation was done with external standards in ethyl acetate.

Table 72 Recovery data for method FAMS 059-01 & -02 measuring metconazole in rape seed and oil using GC-NPD.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Oilseed rape	0.01	3	87	4.1	Memmesheimer, 1996, METCON_049
		0.10	3	74	3.1	
		1.0	3	68	3.4	
	Rape oil	0.01	3	90	2.6	
		0.10	2	92	-	
		1.0	3	87	1.1	
	Oilseed rape	0.01	10	95	10	Memmesheimer, 1997, METCON_050
		0.10	10	88	3.7	

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
		1.0	10	86	6.6	Memmesheimer, 1999, METCON_051
trans-Metconazole	Oilseed rape	0.01	3	74	2.1	Memmesheimer, 1996, METCON_049
		0.10	3	75	3.5	
		1.0	3	68	3.4	
	Rape oil	0.01	3	94	1.2	
		0.10	2	92	-	
		1.0	3	88	1.7	
	Oilseed rape	0.01	10	96	8.4	Memmesheimer, 1997, METCON_050 Memmesheimer, 1999, METCON_051
		0.10	10	89	3.0	
		1.0	10	86	7.0	

Table 73 Recovery data for method FAMS 059-01 & -02 measuring metconazole in rape seed and oil using GC-MS

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Oilseed rape	0.01	3	106	2.8	Memmesheimer, 1996, METCON_049
		0.10	3	78	1.5	
		1.0	3	70	5.4	
	Rape oil	0.01	3	89	2.8	
		0.10	2	97	-	
		1.0	3	87	5.0	
	Oilseed rape	0.01	2	106	-	Memmesheimer, 1997, METCON_050 Memmesheimer, 1999, METCON_051
		0.10	3	96	7.8	
		1.0	3	77	9.4	
trans-Metconazole	Oilseed rape	0.01	3	104	4.2	Memmesheimer, 1996, METCON_049
		0.10	3	78	2.0	
		1.0	3	69	4.6	
	Rape oil	0.01	3	100	2.6	
		0.10	2	97	-	
		1.0	3	88	5.0	
	Oilseed rape	0.01	2	113	-	Memmesheimer, 1997, METCON_050 Memmesheimer, 1999, METCON_051
		0.10	3	96	6.9	
		1.0	3	77	10	

Independent laboratory validation of method FAMS 059-02:

The sample extraction, clean-up and method of determination were, with minor modification, identical to FAMS 059-02.

Table 74 Recovery data for the ILV of FAMS 059-02 measuring metconazole in rape seed using GC-NPD.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Oilseed rape	0.01	2	86	-	Kwasniok & Pelz, 1997 METCON_068
		0.10	2	82	-	
		1.0	2	80	-	
trans-Metconazole		0.01	2	86	-	

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
		0.10	2	80	-	
		1.0	2	80	-	

Table 75 Recovery data for the ILV of FAMS 059-02 measuring metconazole in rape seed using GC-MS.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Oilseed rape	0.01	1	82	-	Kwasniok & Pelz, 1997 METCON_068
		1.0	1	72	-	
trans-Metconazole		0.01	1	76	-	
		1.0	1	73	-	

FAMS 069-01

Pea seed and pea straw were homogenized with acetone/hexane (1+1, v/v). After filtration through quartz wool, water and sodium chloride was added and the extract partitioned twice against ethyl acetate. The organic extracts were combined, evaporated to dryness and the remainder reconstituted in methanol. Further clean-up was carried out by GPC with methanol as eluent.

Final determination of metconazole was done by GC-NPD using a DB–5 column and by GC-MS for confirmation. Quantitation was done with external standards in ethyl acetate.

Table 76 Recovery data for method FAMS 069-01 measuring metconazole in pea seed and straw using GC-NPD

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Dry pea seeds	0.01	3	101	5.7	Memmesheimer, 1997, METCON_052 Memmesheimer, 1997, METCON_053
		0.10	3	88	1.1	
		1.0	3	88	4.6	
	Pea straw	0.03	3	99	1.5	
		0.30	3	88	4.0	
		3.0	3	86	5.8	
trans-Metconazole	Dry pea seeds	0.01	3	91	3.5	
		0.10	3	96	1.8	
		1.0	3	92	3.9	
	Pea straw	0.03	3	108	1.4	
		0.30	3	88	3.4	
		3.0	3	85	6.5	
cis-Metconazole	Dry pea seeds	0.01	6	95	7.7	Memmesheimer, 1999, METCON_054
		0.10	6	85	5.0	
		1.0	6	84	4.6	
	Pea straw	0.03	7	102	7.8	
		0.30	8	90	9.7	
		3.0	8	83	3.6	
trans-Metconazole	Dry pea seeds	0.01	6	89	4.7	
		0.10	6	85	5.2	
		1.0	6	84	4.2	
	Pea straw	0.03	8	92	5.9	
		0.30	8	90	9.7	
		3.0	8	83	3.1	

Table 77 Recovery data for method FAMS 069-01 measuring metconazole in pea seed and straw using GC-MS.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Dry pea seeds	0.01	3	105	1.5	Memmesheimer, 1997, METCON_052 Memmesheimer, 1997, METCON_053
		0.10	3	92	3.9	
		1.0	3	92	3.1	
	Pea straw	0.03	3	110	2.3	
		0.30	3	91	5.0	
		3.0	3	86	7.3	
trans-Metconazole	Dry pea seeds	0.01	3	108	1.4	
		0.10	3	88	3.4	
		1.0	3	85	6.5	
	Pea straw	0.03	3	114	1.0	
		0.30	3	92	5.0	
		3.0	3	87	7.1	

M 2722

Whole banana and banana pulp was homogenized with 1 mol/L HCl. After centrifugation, the aqueous acid extract was partitioned against dichloromethane. The organic extracts were combined, evaporated to dryness and the remainder reconstituted in methanol. Further clean-up was carried out by GPC with methanol as eluent.

Final determination of metconazole was done by GC-NPD using a DB–5 column and by GC-MS for confirmation. Quantitation was done with external standards in ethyl acetate.

Table 78 Recovery data for method M 2722 measuring metconazole in whole banana and banana pulp using GC-NPD

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Recovery [%]	Reference
cis-Metconazole	Whole banana	0.05	1	81	Khunachak, 1998, METCON_055
		1.0	1	79	
	Banana pulp	0.05	1	73	
		1.0	1	79	
trans-Metconazole	Whole banana	0.05	1	81	
		1.0	1	78	
	Banana pulp	0.05	1	86	
		1.0	1	96	
cis-Metconazole	Whole banana	2.0	1	75	Sweeney & Khunachak, 1998, METCON_056
	Banana pulp	2.0	1	77	
trans-Metconazole	Whole banana	2.0	1	73	
	Banana pulp	2.0	1	74	

Extraction efficiency of method M 2722 was demonstrated by a radio validation with whole banana and banana pulp (Sweeney & Khunachak, 1998, METCON_056). Based on the total radioactive residue in the sample, method M 2722 showed a sufficient extractability of 76% and 78% in whole banana and pulp, respectively.

Independent laboratory validation of method M 2722:

The sample extraction, clean-up and method of determination were, with minor modification, identical to M 2722.

Table 79 Recovery data for the ILV of M 2722 measuring metconazole in whole banana and banana pulp using GC-NPD

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Recovery [%]	RSD [%]	Reference
cis-Metconazole	Whole banana	0.05	2	78	-	Sweeney & Khunachak, 1998, METCON_067
		0.1	2	81	-	
		1.0	2	79	-	
	Banana pulp	0.05	2	72	-	
		0.1	4	72	15	
		1.0	4	77	10	
trans-Metconazole	Whole banana	0.05	2	78	-	
		0.1	2	82	-	
		1.0	2	78	-	
	Banana pulp	0.05	2	87	-	
		0.1	4	80	16	
		1.0	4	92	22	

BASF method 550/0

Samples were extracted with methanol/water/2 mol/L HCl (70+25+5, v/v/v), followed by centrifugation. The supernatant was diluted with water and an aliquot partitioned against dichloromethane. The dichloromethane phase was evaporated to dryness and the remainder reconstituted in methanol/water (8+2, v/v).

Final determination of metconazole was done by LC-MS/MS in positive ionization mode using a Luna C18 column and monitoring the ion transition m/z 320→70.

Table 80 Recovery data for BASF method 550/0 measuring metconazole in plant matrices.

Matrix	Analyte	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
Cereal forage	*cis*-metconazole	0.005	5	97	2.4	Lehmann & Mackenroth, 2004, METCON_057
		0.05	5	95	1.2	
		Overall	10	96	2.3	
	trans-metconazole	0.005	5	103	2.6	
		0.05	5	97	0.8	
		Overall	10	100	3.8	
Cereal grain	*cis*-metconazole	0.005	5	106	1.8	
		0.05	5	103	1.8	
		Overall	10	105	2.2	
	trans-metconazole	0.005	5	105	1.4	
		0.05	5	102	1.2	
		Overall	10	103	1.9	
Cereal straw	*cis*-metconazole	0.005	5	103	4.9	
		0.05	5	101	3.0	
		Overall	10	102	4.0	
	trans-metconazole	0.005	5	106	1.2	
		0.05	5	101	1.4	
		Overall	10	103	3.2	
Oilseed rape seed	*cis*-metconazole	0.005	5	99	4.7	
		0.05	5	98	1.7	
		Overall	10	98	3.4	
	trans-	0.005	5	107	1.5	

Matrix	Analyte	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
	metconazole	0.05	5	101	1.7	
		Overall	10	104	3.3	
Lemon fruit	*cis*-metconazole	0.005	5	88	2.5	
		0.05	5	97	2.3	
		Overall	10	93	5.7	
	trans-metconazole	0.005	5	101	2.3	
		0.05	5	98	3.7	
		Overall	10	100	3.4	
Dry pea seed	*cis*-metconazole	0.005	5	87	1.7	
		0.05	5	97	0.7	
		Overall	10	92	6.2	
	trans-metconazole	0.005	5	102	1.9	
		0.05	5	98	1.2	
		Overall	10	100	2.7	
Tomato fruit	*cis*-metconazole	0.005	5	89	6.3	
		0.05	5	99	2.2	
		Overall	10	94	7.0	
	trans-metconazole	0.005	5	102	4.4	
		0.05	5	101	1.7	
		Overall	10	101	3.3	

Method RM–41C–1

Samples were homogenized with acetonitrile/water (7+3, v/v). After filtration the extract is evaporated to the aqueous remainder and partitioned against hexane. In a second liquid-liquid partitioning step, the hexane extract is extracts with acetonitrile. Further clean-up of the acetonitrile phase was carried out by SPE on a C18 cartridge, where the analytes were eluted with methanol/water (5+1, v/v). After evaporation to dryness, the remainder was reconstituted in toluene.

Final determination of metconazole was done by GC-NPD using a DB–1, DB–5 or DB–17 column Quantitation was done with external standards in toluene.

Table 81 Recovery data for method RM–41C–1 measuring metconazole in peaches, blueberries and dry beans using GC-NPD.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Peach	0.02	3	90	3.4	Fujie, 2006, METCON_060
		0.1	6	96	2.2	
trans-Metconazole	Peach	0.02	3	92	4.4	
		0.1	6	97	4.9	
cis-metconazole	Blueberry	0.02	6	109	45 [a]	Thompson, 2010, METCON_061
		0.04	3	90	11	
		0.05	6	103	8.5	
		0.20	3	96	2.4	
		2.0	3	89	1.9	
trans-metconazole	Blueberry	0.02	6	113	19	
		0.04	3	114	22[1]	
		0.05	6	103	5.3	
		0.20	3	98	2.6	
		2.0	3	96	1.6	
cis-Metconazole	Dry bean	0.02	10	88	11	Corley, 2013, METCON_062
		0.2	8	79	14	
trans-Metconazole	Dry bean	0.02	10	93	12	
		0.2	8	77	15	
cis-Metconazole	Dry bean	0.02	7	108	11	Corley, 2013,

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
		0.2	8	91	7.8	METCON_064
trans-Metconazole	Dry bean	0.02	7	111	11	
		0.2	8	86	5.2	
cis-Metconazole	Sunflower seed	0.02	11	92	12	Corley, 2013, METCON_065
		0.20	10	79	8.5	
		1.0	3	80	3.7	
	Sunflower meal	0.02	3	97	4.7	
		0.20	5	85	8.6	
	Sunflower oil	0.02	4	98	15	
		0.20	6	92	16	
trans-Metconazole	Sunflower seed	0.02	11	102	15	
		0.20	10	87	8.7	
		1.0	3	83	3.1	
	Sunflower meal	0.02	3	101	11	
		0.20	5	87	12	
	Sunflower oil	0.02	4	94	6.9	
		0.20	6	91	15	

[a] Fortification data not used due to unacceptable relative standard deviation.

Independent laboratory validation of method RM–41C–1:

The sample extraction, clean-up and method of determination were, with minor modification (Rtx–5 and Rtx–35), identical to RM–41C–1.

Table 82 Recovery data for the ILV of method RM–41C–1 measuring metconazole in almonds using GC-NPD.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]		RSD [%]		Reference
				Rtx–5	Rtx–35	Rtx–5	Rtx–35	
cis-Metconazole	Almond (nutmeat)	0.02	3	103	100	6.9	6.1	Noon, 2006, METCON_069
		0.04	3	105	100	0.56	0.64	
		0.20	3	101	97	4.4	4.2	
trans-Metconazole	Almond (nutmeat)	0.02	3	106	95	4.9	8.3	
		0.04	3	104	100	1.7	0.84	
		0.20	3	97	98	5.4	4.4	

Method RM–41C–2–1

Samples were homogenized with acetonitrile/water (7+3, v/v). After filtration the extract is evaporated to the aqueous remainder and partitioned against hexane/ethyl acetate (9+1, v/v). Further clean-up of the acetonitrile phase was carried out by SPE on an Oasis HLB cartridge, where the analytes were eluted with methanol/0.05% formic acid (5+1, v/v). The acetonitrile was removed by evaporation and the remainder was re-dissolved in methanol/water (1+1, v/v).

Final determination of metconazole was done by LC-MS/MS in positive ionization mode using a ACE C18 column and monitoring the ion transitions m/z 320→125 and m/z 320→70. Quantitation was done with external standards in methanol/water.

Table 83 Recovery data for method RM–41C–2–1 measuring metconazole in dry beans using LC-MS/MS.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Dry bean	0.02	5	102	6.1	Green, 2010, METCON_063
		0.1	5	89	6.0	
trans-Metconazole	Dry bean	0.02	5	100	6.1	
		0.1	5	89	4.9	
cis-Metconazole	Dry bean	0.02	3	108	11	Green, 2010, METCON_066
		0.1	3	104	10	
trans-Metconazole	Dry bean	0.02	3	108	9.5	
		0.1	3	106	10	

Method RM–41C–3

The method RM–41C–3 is revised version of method RM–41C–2 with modified LC-MS/MS conditions and expanded to metabolites M11, M21 and M30. Samples were homogenized with acetonitrile/water (7+3, v/v). After filtration the extract is evaporated to the aqueous remainder and partitioned against hexane/ethyl acetate (9+1, v/v). Further clean-up of was carried out by liquid-liquid partitioning with acetonitrile/hexane, followed by SPE on a C18 cartridge.

Final determination of metconazole and metabolites M22, M21 and M30 was done by LC-MS/MS in positive ionization mode using a Luna C18 column and monitoring the ion transitions m/z 320→125 for metconazole, m/z 336→125 for M11 & M21 and m/z 334→139 for M30. Quantitation was done with external standards in solvent.

Table 84 Recovery data for method RM–41C–2 and RM–41C–3 measuring metconazole in plant matrices using LC-MS/MS.

Matrix	Analyte	Fortification Level [mg/kg]	Number of Replicates	Mean Recovery [%]	RSD [%]	Reference
Straw	Metconazole [a]	0.02	4	86.9	6.1	Green, 2007, METCON_080
		0.1	6	90.0	6.4	
Turfgrass	M11[b]	0.02	3	103.6	1.3	
		0.1	6	86.2	7.2	
Turfgrass	M21[2]	0.02	3	100.6	2.4	
		0.1	6	85.2	7.8	
Straw	M30[1]	0.02	4	75.9	4.0	
		0.1	6	82.0	8.1	

[a] LC-MS/MS conditions of analytical method RM–41C–2

[b] LC-MS/MS conditions of analytical method RM–41C–3

DFG S19 method

Samples of high water content, acidic and dry plant matrices were homogenized in acetone/water (2+1, v/v). After addition of sodium chloride, the extract was partitioned against ethyl acetate/cyclohexane (1+1, v/v). Oily plant matrices were homogenized with acetonitrile/acetone (9:1, v/v) in the presence of Celite and Calflo E. Further clean-up for all samples were performed by GPC.

Final determination of metconazole was done by GC-NPD using a DB–1 or DB–5 column and by GC-NPD using a DB 17 column and GC-MS for confirmation. Quantitation was done with external standards in ethyl acetate.

Alternatively, final determination of metconazole was done by LC-MS/MS in positive ionization mode using a Luna C18 column and monitoring the ion transitions m/z 320→125 and m/z 320→70. Quantitation was done with external standards in methanol/water (1/1, v/v).

Table 85 Recovery data for method DFG S 19 measuring metconazole in plant matrices using GC-NPD with a DB–1 column

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Wheat grain	0.010	5	86	10	Class, 1999, METCON_070
		0.10	5	82	3	
	Grapes	0.010	5	85	19	
		0.10	5	94	7	
	Dry pea	0.010	5	85	18	
		0.10	7	78	9	
	Rape seed	0.010	5	94	14	
		0.10	5	92	10	
trans-Metconazole	Wheat grain	0.010	5	91	11	Class, 2003, METCON_071
		0.10	5	83	4	
	Grapes	0.010	5	90	8	
		0.10	5	92	9	
	Dry pea	0.010	5	85	16	
		0.10	7	79	13	
	Rape seed	0.010	5	89	18	
		0.10	5	86	12	
cis-Metconazole	Wheat grain	0.01	2	107	-	Tillkes, 1996, METCON_072
		1.0	2	85	-	
	Wheat straw	0.03	2	105	-	
		3.0	2	100	-	
trans-Metconazole	Wheat grain	0.01	2	92	-	
		1.0	2	83	-	
	Wheat straw	0.03	2	98	-	
		3.0	2	99	-	

Table 86 Confirmatory recovery data for method DFG S 19 measuring metconazole in wheat grain, grape, pea and rape seed using GC-NPD with a DB–17 column

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Wheat grain	0.010	1	92	-	Class, 1999, METCON_070
		0.10	1	77	-	
	Grapes	0.010	1	101	-	
		0.10	1	88	-	
	Dry pea	0.010	1	106	-	
		0.10	1	100	-	
	Rape seed	0.010	1	77	-	
		0.10	1	102	-	
trans-Metconazole	Wheat grain	0.010	1	108	-	Class, 2003, METCON_071
		0.10	1	78	-	
	Grapes	0.010	1	100	-	
		0.10	1	90	-	
	Dry pea	0.010	1	105	-	
		0.10	1	101	-	
	Rape seed	0.010	1	80	-	
		0.10	1	109	-	

Table 87 Recovery data for method DFG S 19 measuring metconazole in apple, grape, wheat grain, pea and rape seed by LC-MS/MS using ion transition m/z 320→70

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Apple	0.005	5	87	4.9	Kuhn, 2014, METCON_073
		0.05	5	82	2.2	
	Grapes	0.005	5	97	5.8	
		0.05	5	96	10	
	Wheat grain	0.005	5	92	8.7	
		0.05	5	82	7.3	
	Dry pea	0.005	5	93	5.4	
		0.05	5	79	4.1	
	Rape seed	0.005	5	96	17	
		0.05	5	99	6.4	
trans-Metconazole	Apple	0.005	5	85	5.1	Richter, 2014, METCON_074
		0.05	5	80	2.5	
	Grapes	0.005	5	100	6.3	
		0.05	5	97	12	
	Wheat grain	0.005	5	92	8.9	
		0.05	5	83	7.3	
	Dry pea	0.005	5	94	5.7	
		0.05	5	81	4.4	
	Rape seed	0.005	5	95	17	
		0.05	5	100	5.6	

Table 88 Confirmatory recovery data for method DFG S 19 measuring metconazole in apple, grape, wheat grain, pea and rape seed by LC-MS/MS using ion transition m/z 320→125

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Apple	0.005	5	86	4.9	Kuhn, 2014, METCON_073
		0.05	5	82	2.6	
	Grapes	0.005	5	101	4.6	
		0.05	5	96	11	
	Wheat grain	0.005	5	93	8.0	
		0.05	5	82	7.9	
	Dry pea	0.005	5	92	5.9	
		0.05	5	77	5.2	
	Rape seed	0.005	5	97	19	
		0.05	5	100	5.7	
trans-Metconazole	Apple	0.005	5	85	6.1	Richter, 2014, METCON_074
		0.05	5	81	2.0	
	Grapes	0.005	5	99	6.5	
		0.05	5	98	12	
	Wheat grain	0.005	5	91	7.3	
		0.05	5	82	8.4	
	Dry pea	0.005	5	95	5.5	
		0.05	5	81	4.4	
	Rape seed	0.005	5	96	18	
		0.05	5	100	6.4	

Independent laboratory validation of method DFG S19:

The sample extraction, clean-up and method of determination were identical.

Table 89 Recovery data for the ILV of method DFG S19 measuring metconazole in plant matrices using LC-MS/MS using ion transition m/z 320→70

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Apple	0.005	5	79	8.5	Schemikau & Colorado, 2015, METCON_075
		0.05	5	78	7.9	
	Grapes	0.005	5	110	2.4	
		0.05	5	95	6.6	
	Wheat grain	0.005	5	91	5.8	
		0.05	5	77	16	
	Pea	0.005	5	96	13	
		0.05	5	82	7.0	
	Rape seed	0.005	5	83	18	
		0.05	5	75	10	
trans-Metconazole	Apple	0.005	5	73	11	
		0.05	5	75	9.2	
	Grapes	0.005	5	109	2.1	
		0.05	5	93	5.8	
	Wheat grain	0.005	5	92	6.5	
		0.05	5	77	14	
	Pea	0.005	5	93	13	
		0.05	5	80	7.3	
	Rape seed	0.005	5	84	16	
		0.05	5	75	9.8	

Table 90 Recovery data for the ILV of method DFG S19 measuring metconazole in plant matrices using LC-MS/MS using ion transition m/z 320→125

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Apple	0.005	5	78	8.0	Schemikau & Colorado, 2015, METCON_075
		0.05	5	78	7.9	
	Grapes	0.005	5	109	1.0	
		0.05	5	95	6.6	
	Wheat grain	0.005	5	91	7.9	
		0.05	5	77	16	
	Pea	0.005	5	94	14	
		0.05	5	83	8.1	
	Rape seed	0.005	5	83	19	
		0.05	5	75	9.3	
trans-Metconazole	Apple	0.005	5	73	10	
		0.05	5	75	10	
	Grapes	0.005	5	109	2.1	
		0.05	5	93	5.8	
	Wheat grain	0.005	5	91	6.8	
		0.05	5	78	16	
	Pea	0.005	5	93	13	
		0.05	5	80	7.3	
	Rape seed	0.005	5	83	15	
		0.05	5	74	10	

Method POP-PA.0223 (R-AR−844-05)

Samples of soya bean were mixed with sodium sulfate anhydrous and homogenized with acetone/hexane (1:1; v/v), followed by centrifugation. The supernatant was evaporated to dryness, the remainder dissolved in hexane and the extract further cleaned-up using SCX solid phase extraction followed by partitioning against ethyl acetate/dichloromethane (1:2; v/v).

Final determination of metconazole was done by GC-NPD.

Table 91 Recovery data for method POP-PA.0223 measuring metconazole in soya bean seeds using GC-NPD.

Matrix	Fortification level (mg/kg)	n	Recovery, mean (%)	RSD (%)	Reference
Soya bean seeds	0.01	5	99.8	8.9	Dantas, 2005, METCON_076
	1.0	5	82.4	13	

Method D0604

Samples of corn and cotton RAC and processed commodities were homogenized with acetonitrile/water (7+3; v/v). If necessary, the extracts are subjected to further sample preparation steps for clean-up applying either liquid-liquid partition (hexane/ethyl acetate or hexane), filters or solid phase extraction.

Final determination was done by LC-MS/MS. For metconazole, M11, M21 and M30, separation was achieved using a Luna C18 column and monitoring the ion transitions m/z 320→70, m/z 336→125, m/z 336→125 and m/z 334→111, respectively. For 1,2,4-triazole (T), triazolyl alanine (TA) and triazolyl acetic acid (TAA) separation is achieved using a Hypercarb column and monitoring the ion transitions m/z 70→43, m/z 157→88 and m/z 128→70, respectively.

Table 92 Recovery data for method D0604 measuring metconazole and metabolites M11, M21, M30, T, TA, TAA in corn and cotton RAC and processed commodities.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-metconazole	Maize grain	0.005	5	99	4	Saha, 2007, METCON_077
		0.05	5	100	3	
	Maize stover	0.005	5	91	3	
		2.5	5	88	3	
	Cotton seed	0.005	5	94	11	
		0.05	5	101	8	
	Cotton by-products	0.005	5	88	7	
		2.5	5	73	15	
trans-metconazole	Maize grain	0.005	4	97	4	
		0.05	5	96	5	
	Maize stover	0.005	5	87	5	
		2.5	5	86	4	
	Cotton seed	0.005	5	96	12	
		0.05	5	100	6	
	Cotton by-products	0.005	5	95	5	
		2.5	5	71	13	
M11	Maize grain	0.01	5	82	4	
		0.1	5	76	6	
	Maize stover	0.01	5	70	8	
		1.0	5	65	5	
	Cotton seed	0.01	5	75	9	
		0.1	5	75	11	
	Cotton by-products	0.01	5	74	4	
		1.0	5	68	9	
M21	Maize grain	0.01	5	100	8	

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
		0.1	5	94	10	
	Maize stover	0.01	5	91	12	
		1.0	5	75	12	
	Cotton seed	0.01	5	86	11	
		0.1	5	94	12	
	Cotton by-products	0.01	5	85	7	
		1.0	5	77	7	
M30	Maize grain	0.01	5	100	5	
		0.1	5	91	3	
	Maize stover	0.01	5	87	4	
		1.0	5	88	8	
	Cotton seed	0.01	5	93	9	
		0.1	5	96	13	
	Cotton by-products	0.01	5	77	5	
		1.0	5	77	8	
T	Maize grain	0.01	5	76	4	
		0.5	5	105	9	
	Maize stover	0.05	5	93	7	
		0.5	5	97	12	
	Cotton seed	0.01	5	101	8	
		0.5	5	90	2	
	Cotton by-products	0.05	4	85	16	
		0.5	5	83	7	
	Cotton oil	0.01	5	90	18	
TA	Maize grain	0.05	5	80	4	
		0.5	5	83	12	
	Maize stover	0.05	5	97	12	
		0.5	5	98	10	
	Cotton seed	0.05	5	79	8	
		0.5	5	73	5	
	Cotton by-products	0.05	4	81	11	
		0.5	5	64	4	
TAA	Maize grain	0.01	5	91	7	
		0.5	5	91	3	
	Maize stover	0.05	5	96	4	
		0.5	5	89	5	
	Cotton seed	0.01	5	87	8	
		0.5	5	94	3	
	Cotton by-products	0.05	4	86	10	
		0.5	5	79	3	
	Cotton oil	0.01	5	107	3	

Method 01062/M004

Samples of various plant materials were homogenized with methanol/water (4+1; v/v). An aliquot of the extracts was filtered, concentrated and cleaned-up by dispersive SPE with C18 material.

Final determination of 1,2,4-triazole (T), triazolyl alanine (TA), triazolyl acetic acid (TAA) and triazolyl lactic acid (TLA) was done by LC-MS/MS. For T, TA (only for tomato, cucumber, lettuce and carrot leaf), TAA and TLA, separation is achieved using a Aquasil C18 column, while for TA and TLA (only for dry bean seed), a Hypercarb column was used. For T, TA, TAA and TLA the mass transitions m/z 70→43, m/z 157→70, m/z 128→70 and m/z 158→70 were used, respectively. Quantitation was done with external standards in solvent.

Table 93 Recovery data for method 01062/M004 measuring metabolite 1,2,4-triazole (T) in various plant matrices.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
1,2,4-triazole (T)	Tomato	0.01	5	105	10	Class, 2011, METCON_078
		1.0	5	98	5	
	Cucumber	0.01	3	90	14	
		1.0	3	100	3	
	Lettuce	0.01	3	88	8	
		1.0	3	102	1	
	Cereal grain	0.01	5	115	4	
		1.0	5	118	5	
	Cereal straw	0.01	3	109	17	
		1.0	3	102	19	
	Cereal green plant	0.01	3	109	7	
		1.0	3	116	4	
	Whole orange	0.01	5	100	10	
		1.0	5	100	2	
	Rape seed	0.01	5	102	7	
		1.0	5	93	6	
	Melon peel	0.01	3	94	12	
		1.0	3	108	7	
	Melon fruit	0.01	3	98	2	
		1.0	3	100	9	
	Melon pulp	0.01	3	97	5	
		1.0	3	110	2	
	Sweet pepper	0.01	3	87	11	
		1.0	3	107	9	
	Dry bean seed	0.01	5	104	8	
		1.0	5	96	8	
	Carrot leaf	0.01	3	112	6	
		1.0	3	97	6	
	Carrot root	0.01	3	90	5	
		1.0	3	98	6	

Table 94 Recovery data for method 01062/M004 measuring metabolite triazolyl alanine (TA) in various plant matrices

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
Triazolyl alanine (TA)	Tomato	0.01	5	111	14	Class, 2011, METCON_078
		1.0	5	110	12	
	Cucumber	0.01	3	111	13	
		1.0	3	109	7	
	Lettuce	0.01	3	116	6	
		1.0	3	106	9	
	Cereal grain	0.01	5	91	12	
		1.0	5	84	6	
	Cereal straw	0.01	3	79	19	
		1.0	3	76	1	
	Cereal green plant	0.01	3	108	8	
		1.0	3	100	4	
	Whole orange	0.01	5	90	6	
		1.0	5	100	3	
	Sunflower seed	0.01	5	101	25	
		1.0	5	92	5	
	Melon peel	0.01	3	97	27	
		1.0	3	96	7	

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
	Melon fruit	0.01	3	101	9	
		1.0	3	107	6	
	Melon pulp	0.01	3	77	29	
		1.0	3	110	7	
	Sweet pepper	0.01	3	104	21	
		1.0	3	104	9	
	Dry bean seed	0.01	5	88	12	
		1.0	5	81	9	
	Carrot leaf	0.01	3	118	10	
		1.0	3	110	14	
	Carrot root	0.01	3	98	9	
		1.0	3	105	1	

Table 95 Recovery data for method 01062/M004 measuring metabolite triazolyl acetic acid (TAA) in various plant matrices.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
Triazolyl acetic acid (TAA)	Tomato	0.01	5	90	5	Class, 2011, METCON_078
		1.0	5	101	5	
	Cucumber	0.01	3	100	10	
		1.0	3	105	4	
	Lettuce	0.01	3	105	5	
		1.0	3	104	5	
	Cereal grain	0.01	5	97	9	
		1.0	5	80	5	
	Cereal straw	0.01	3	109	17	
		1.0	3	90	9	
	Cereal green plant	0.01	3	103	7	
		1.0	3	102	5	
	Whole orange	0.01	5	92	3	
		1.0	5	92	3	
	Oilseed rape seed	0.01	5	99	13	
		1.0	5	95	4	
	Melon peel	0.01	3	92	7	
		1.0	3	96	2	
	Melon fruit	0.01	3	97	5	
		1.0	3	110	2	
	Melon pulp	0.01	3	99	3	
		1.0	3	105	7	
	Sweet pepper	0.01	3	106	1	
		1.0	3	110	1	
	Dry bean seed	0.01	5	103	11	
		1.0	5	72	7	
	Carrot leaf	0.01	3	106	11	
		1.0	3	108	3	
	Carrot root	0.01	3	104	9	
		1.0	3	105	4	

Table 96 Recovery data for method 01062/M004 measuring metabolite triazolyl acetic acid (TAA) in various plant matrices.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
Triazolyl lactic acid (TLA)	Tomato	0.01	5	92	13	Class, 2011, METCON_078
		1.0	5	114	5	
	Cucumber	0.01	3	100	6	
		1.0	3	108	2	
	Lettuce	0.01	3	108	6	
		1.0	3	104	7	
	Cereal grain	0.01	5	80	3	
		1.0	5	79	5	
	Cereal straw	0.01	3	100	6	
		1.0	3	85	12	
	Cereal green plant	0.01	3	89	7	
		1.0	3	98	5	
	Whole orange	0.01	5	95	6	
		1.0	5	92	7	
	Oilseed rape seed	0.01	5	82	10	
		1.0	5	98	3	
	Melon peel	0.01	3	105	4	
		1.0	3	93	4	
	Melon fruit	0.01	3	106	10	
		1.0	3	109	2	
	Melon pulp	0.01	3	103	10	
		1.0	3	108	4	
	Sweet pepper	0.01	3	107	9	
		1.0	3	110	1	
	Dry bean seed	0.01	5	91	6	
		1.0	5	94	5	
	Carrot leaf	0.01	3	118	6	
		1.0	3	102	4	
	Carrot root	0.01	3	105	5	
	Tomato	0.01	5	92	13	

Method 535/1 (L0076/01)

Samples were homogenized with methanol/water /2 mol/L HCl (70+25+5, v/v/v). After centrifugation the supernatant is partitioned against cyclohexane. The cyclohexane was removed by evaporation and the remainder was re-dissolved in methanol/water (1+1, v/v).

Final determination of metconazole was done by LC-MS/MS in positive ionization mode using a Betasil C18 column and monitoring the ion transitions m/z 320→125 and m/z 320→70. The *cis*- and *trans*-isomers of metconazole eluted together and were quantitated as total metconazole. Quantitation was done with external standards in solvent.

Table 97 Recovery data for method 535/1 measuring metconazole in various plant matrices by LC-MS/MS using ion transition m/z 320→70

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
Metconazole	Wheat plant without root	0.010	5	94	2.6	Mackenroth & Lehmann, 2007, METCON_079
		0.10	5	92	6.1	
	Wheat grain	0.010	5	96	2.5	
		0.10	5	92	4.3	
	Wheat straw	0.010	5	91	3.9	
		0.10	5	89	5.7	

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
	Lemon fruit	0.010	5	89	3.1	
		0.10	5	83	4.9	
	Lettuce	0.010	5	92	2.5	
		0.10	5	88	5.6	
	Oilseed rape seed	0.010	5	97	1.8	
		0.10	5	94	4.3	
	Tomato	0.010	5	94	1.2	
		0.10	5	91	2.3	
	Onion bulb	0.010	5	94	3.3	
		0.10	5	89	4.7	

Table 98 Confirmatory recovery data for method 535/1 measuring metconazole in various plant matrices by LC-MS/MS using ion transition m/z 320→125.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
Metconazole	Wheat plant without root	0.010	5	88	12	Mackenroth & Lehmann, 2007, METCON_079
		0.10	5	88	7.0	
	Wheat grain	0.010	5	94	4.2	
		0.10	5	94	10	
	Wheat straw	0.010	5	93	11	
		0.10	5	87	5.9	
	Lemon fruit	0.010	5	93	7.5	
		0.10	5	83	6.7	
	Lettuce	0.010	5	91	8.7	
		0.10	5	88	13	
	Oilseed rape seed	0.010	5	99	3.8	
		0.10	5	98	13	
	Tomato	0.010	5	97	4.9	
		0.10	5	89	4.5	
	Onion bulb	0.010	5	98	3.2	
		0.10	5	93	3.6	

Method Meth−160

Samples of canola seed were homogenized with methanol/water (4+1; v/v), while canola oil was diluted with hexane and partitioned against methanol/water. The aqueous methanolic extracts are brought to final volume with methanol/water (80/20, v/v) and aliquots for each analyte are processed separately through SPE clean-up and/or derivatization steps with dansyl chloride, which are specific for each analyte. Internal standard, specific for each analyte, is added to each aliquot prior to processing.

Final determination of 1,2,4-triazole (T), triazolyl alanine (TA), and triazolyl acetic acid (TAA) was done by LC-MS/MS and a Luna C18 column. For the derivatives of T, TA and TAA the mass transitions m/z 303→170, m/z 409→70, m/z and 184→70 were used, respectively. Quantitation was done with external standards in solvent.

Table 99 Recovery data for method Meth–160 measuring metabolite 1,2,4-triazole (T), triazolyl alanine (TA), triazolyl acetic acid (TAA) in various canola matrices.

Matrix	Analyte	Fortification Level [ppm]	Number of Replicates	Recoveries [%]	Overall Mean Recovery [%]	RSD [%]	Reference
Rape seed	1,2,4-Triazole (T)	0.01	3	89, 102, 84	88	7.8	Green, 2007, METCON_080
		0.1	3	79, 86, 90			

Matrix	Analyte	Fortification Level [ppm]	Number of Replicates	Recoveries [%]	Overall Mean Recovery [%]	RSD [%]	Reference
Rape seed	Triazole Alanine (TA)	0.03	3	94, 85, 96	88	5.7	
		0.3	3	84, 86, 82			
	Triazolyl acetic acid (TAA)	0.01	3	91, 88, 91	87	3.7	
		0.1	3	83, 84, 84			
	1,2,4-Triazole (T)	0.01	3	87, 85, 96	86	6.0	
		0.1	3	85, 78, 82			
	Triazole Alanine (TA)	0.01	3	100, 91, 97	97	3.3	
		0.1	3	98, 100, 97			
	Triazolyl acetic acid (TAA)	0.02	3	96, 96, 93	94	1.9	
		0.2	3	93, 92, 92			

Method POP-PA.0206 (based on MR0007)

Samples of garlic and onion were homogenized with methanol, followed by centrifugation. After addition of water and saturated NaCl solution to the supernatant, the mixture was partitioned against dichloromethane. The solvent was evaporated to dryness and the remainder dissolved in hexane/acetone (95+5, v/v) before further cleaned-up on a Si-cartridge. The residue is eluted through the cartridge with 10% solution of acetone in hexane. The solvent is evaporated to dryness and the residue is dissolved in methyl tert-butyl ether.

Final determination of metconazole was done by GC-NPD using a DB–5 column.

Table 100 Recovery data for method POP-PA.0206 measuring metconazole in garlic and onion using GC-NPD.

Matrix	Analyte	Fortification level [mg/kg]	No. of replicates	Mean Recovery [%]	Mean RSD [%]	Reference
Garlic	Metconazole	0.01	5	98	4.6	Dantas, 2005, METCON_081
		1.0	5	107	5.7	
Onion	Metconazole	0.01	5	91	14	
		1.0	5	76	7.3	

Animal materials

DFG S19 method

Samples of whole milk, whole egg and bovine muscle were homogenized with acetone/water (2+1, v/v). After addition of sodium chloride, the extract was partitioned against ethyl acetate/cyclohexane (1+1, v/v). Bovine fat was homogenized with acetonitrile/acetone (9:1, v/v) in the presence of Celite and Calflo E. Further clean-up for all samples was performed by GPC.

Final determination of metconazole was done by GC-NPD using a DB–1 column and by GC-NPD using a DB 17 column and GC-MS for confirmation. Quantitation was done with external standards in ethyl acetate.

Table 101 Recovery data for method DFG S 19 measuring metconazole in animal matrices using GC-NPD with a DB–1 column.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Whole milk	0.010	5	82	11	Class, 1999, METCON_070
		0.10	5	79	11	
	Bovine muscle	0.010	8	91	13	

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
		0.10	6	78	10	Class, 2003, METCON_071
	Whole egg	0.010	7	99	11	
		0.10	8	91	14	
	Bovine fat	0.010	5	86	10	
		0.10	4	82	9	
trans-Metconazole	Whole milk	0.010	5	80	7	
		0.10	5	79	12	
	Bovine muscle	0.010	8	76	14	
		0.10	6	78	10	
	Whole egg	0.010	7	81	13	
		0.10	8	87	14	
	Bovine fat	0.010	5	79	9	
		0.10	4	76	11	

Table 102 Confirmatory recovery data for method DFG S 19 measuring metconazole in animal matrices using GC-NPD with a DB–17 column.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Whole milk	0.010	1	77	-	Class, 1999, METCON_070 Class, 2003, METCON_071
		0.10	1	96	-	
	Bovine muscle	0.010	1	95	-	
		0.10	1	89	-	
	Whole egg	0.010	2	93	-	
		0.10	1	86	-	
	Bovine fat	0.010	1	110	-	
		0.10	1	109	-	
trans-Metconazole	Whole milk	0.010	1	73	-	
		0.10	1	90	-	
	Bovine muscle	0.010	1	91	-	
		0.10	1	91	-	
	Whole egg	0.010	2	88	-	
		0.10	1	85	-	
	Bovine fat	0.010	1	79	-	
		0.10	1	98	-	

Alternatively, final determination of metconazole was done by LC-MS/MS in positive ionization mode using a Luna C18 column and monitoring the ion transitions m/z 320→125 and m/z 320→70. Quantitation was done with external standards in methanol/water (1/1, v/v).

Table 103 Recovery data for method DFG S 19 measuring metconazole in animal matrices by LC-MS/MS using ion transition m/z 320→70.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Kidney	0.005	5	89	3.3	Kuhn, 2010, METCON_084
		0.05	5	94	2.5	
	Liver	0.005	5	94	9.7	
		0.05	5	88	2.9	
trans-Metconazole	Kidney	0.005	5	88	2.6	
		0.05	5	92	2.4	
	Liver	0.005	5	93	9.1	
		0.05	5	87	3.1	

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Milk	0.005	5	90	18	Kuhn, 2014, METCON_086
		0.05	5	109	3.4	
	Fat	0.005	5	86	11	
		0.05	5	93	7.1	
	Meat	0.005	5	97	4.8	
		0.05	5	86	6.5	
	Egg	0.005	5	110	11	
		0.05	5	102	6.3	
trans-Metconazole	Milk	0.005	5	93	19	
		0.05	5	110	2.3	
	Fat	0.005	5	84	13	
		0.05	5	93	7.0	
	Meat	0.005	5	96	5.6	
		0.05	5	84	5.3	
	Egg	0.005	5	110	11	
		0.05	5	102	6.0	

Table 104 Confirmatory recovery data for method DFG S 19 measuring metconazole in animal matrices by LC-MS/MS using ion transition m/z 320→125.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Kidney	0.005	5	90	3.7	Kuhn, 2010, METCON_084
		0.05	5	94	3.1	
	Liver	0.005	5	93	8.6	
		0.05	5	87	3.4	
trans-Metconazole	Kidney	0.005	5	88	2.4	
		0.05	5	92	3.5	
	Liver	0.005	5	93	9.3	
		0.05	5	87	2.8	
cis-Metconazole	Milk	0.005	5	91	18	Kuhn, 2014, METCON_086
		0.05	5	108	4.3	
	Fat	0.005	5	87	11	
		0.05	5	92	6.6	
	Meat	0.005	5	98	6.7	
		0.05	5	86	6.5	
	Egg	0.005	5	108	13	
		0.05	5	102	6.7	
trans-Metconazole	Milk	0.005	5	92	20	
		0.05	5	110	2.9	
	Fat	0.005	5	86	13	
		0.05	5	93	5.9	
	Meat	0.005	5	96	6.4	
		0.05	5	85	6.0	
	Egg	0.005	5	109	12	
		0.05	5	102	6.3	

Independent laboratory validation of method DFG S19:

The sample extraction, clean-up and method of determination were identical. However, for the determination by GC-NPD, DB-5 column was used instead of the DB–1 of the primary method.

Table 105 Recovery data for the ILV of method DFG S19 measuring metconazole in plant matrices using GC-NPD with a DB–5 column.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Whole milk	0.010	5	88	14	Weeren & Pelz, 1999, METCON_082
		0.10	5	93	5.1	
	Bovine muscle	0.010	5	85	13	
		0.10	5	96	5.6	
	Whole egg	0.010	5	86	7.3	
		0.10	5	81	4.0	
	Bovine fat	0.010	5	74	10	
		0.10	5	85	6.2	
trans-Metconazole	Whole milk	0.010	5	88	6.7	
		0.10	5	97	3.0	
	Bovine muscle	0.010	5	102	8.1	
		0.10	5	102	6.6	
	Whole egg	0.010	5	99	9.6	
		0.10	5	85	6.4	
	Bovine fat	0.010	5	78	8.1	
		0.10	5	75	5.1	

Table 106 Confirmatory recovery data for the ILV of method DFG S 19 measuring metconazole in animal matrices using GC-MS.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Beef tallow fat	0.010	5	96	12	Weeren & Pelz, 1999, METCON_082
		0.10	5	85	8.8	
trans-Metconazole	Beef tallow fat	0.010	5	88	11	
		0.10	5	77	13	

Table 107 Recovery data for the ILV of method DFG S 19 measuring metconazole in animal matrices by LC-MS/MS using ion transition m/z 320→70.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Kidney	0.005	5	82	7.4	Toledo, 2010, METCON_085
		0.05	5	89	6.7	
	Liver	0.005	5	91	8.3	
		0.05	5	97	5.8	
trans-Metconazole	Kidney	0.005	5	83	8.0	
		0.05	5	84	3.7	
	Liver	0.005	5	94	9.4	
		0.05	5	97	6.3	
cis-Metconazole	Milk	0.005	5	109	3.3	Schemikau & Colorado, 2015, METCON_087
		0.05	5	109	7.1	
	Fat	0.005	5	97	5.7	
		0.05	5	79	2.0	
	Meat	0.005	5	110	12	
		0.05	5	98	9.0	
	Egg	0.005	5	110	3.2	
		0.05	5	94	3.5	
trans-Metconazole	Milk	0.005	5	108	3.3	
		0.05	5	107	8.1	

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
	Fat	0.005	5	96	4.6	
		0.05	5	78	2.0	
	Meat	0.005	5	108	12	
		0.05	5	98	9.5	
	Egg	0.005	5	109	3.3	
		0.05	5	92	3.3	

Table 108 Confirmatory recovery data for the ILV of method DFG S 19 measuring metconazole in animal matrices by LC-MS/MS using ion transition m/z 320→125.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-Metconazole	Kidney	0.005	5	84	3.2	Toledo, 2010, METCON_085
		0.05	5	88	5.0	
	Liver	0.005	5	95	7.3	
		0.05	5	96	6.7	
trans-Metconazole	Kidney	0.005	5	78	5.9	
		0.05	5	87	3.4	
	Liver	0.005	5	91	10	
		0.05	5	95	8.0	
cis-Metconazole	Milk	0.005	5	107	3.9	Schemikau & Colorado, 2015, METCON_087
		0.05	5	109	7.3	
	Fat	0.005	5	96	5.4	
		0.05	5	78	2.2	
	Meat	0.005	5	109	12	
		0.05	5	98	8.8	
	Egg	0.005	5	109	4.2	
		0.05	5	94	3.9	
trans-Metconazole	Milk	0.005	5	108	4.6	
		0.05	5	108	8.2	
	Fat	0.005	5	96	4.8	
		0.05	5	78	1.7	
	Meat	0.005	5	107	13	
		0.05	5	98	9.5	
	Egg	0.005	5	110	5.4	
		0.05	5	93	3.4	

Method RM−41M−1 (L0408/01)

Milk samples were shaken with ethyl acetate/methanol (2+1, v/v). The organic phase was evaporated to an aqueous oily remainder and partitioned with dichloromethane/aqueous sodium chloride solution. The organic phase was evaporated and the remainder further cleaned-up by acetonitrile-hexane partition. The acetonitrile phase was removed by rotary evaporation and the remainder was dissolved in toluene.

Final determination of metconazole was done by GC-NPD using a HP–5 column and by LC-MS/MS using a C8 column and monitoring ion transition m/z 320→125 for confirmation. Quantitation was done with external standards in solvent.

Table 109 Recovery data for method RM–41M–1 measuring metconazole in milk using GC-NPD.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-metconazole	Milk	0.02	3	93	2.3	Green, 2006, METCON_083
		0.1	6	88	2.1	
trans-metconazole		0.02	3	95	1.9	
		0.1	6	90	2.4	

Table 110 Confirmatory recovery data for method RM–41M–1 measuring metconazole in milk by LC-MS/MS using ion transition m/z 320→125.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-metconazole	Milk	0.02	3	85	3.7	Green, 2006, METCON_083
trans-metconazole		0.02	3	84	1.3	

Alternatively, final determination of metconazole was done by LC-MS/MS in positive ionization mode using a SB-C8 column and monitoring the ion transitions m/z 320→125 and m/z 320→70. Quantitation was done with external standards in solvent.

Table 111 Recovery data for method RM–41M–1 measuring metconazole in milk and cream by LC-MS/MS using ion transition m/z 320→125.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-metconazole	Milk	0.02	5	84	3.8	Andre & Stahl, 2018, METCON_089
		0.2	5	83	1.5	
	Cream	0.02	5	89	3.9	
		0.2	5	76	4.0	
trans-metconazole	Milk	0.02	5	84	4.1	
		0.2	5	84	2.1	
	Cream	0.02	5	89	3.1	
		0.2	5	76	4.3	

Table 112 Confirmatory recovery data for method RM–41M–1 measuring metconazole in milk and cream by LC-MS/MS using ion transition m/z 320→70.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-metconazole	Milk	0.02	5	84	4.3	Andre & Stahl, 2018, METCON_089
		0.2	5	83	1.3	
	Cream	0.02	5	89	4.1	
		0.2	5	76	3.8	
trans-metconazole	Milk	0.02	5	85	3.8	
		0.2	5	83	2.0	
	Cream	0.02	5	90	3.4	
		0.2	5	77	4.4	

Method RM–41M–2 (L0408/02)

Liver samples were homogenized with acetonitrile. After filtration, the extract was partitioned with hexane. The acetonitrile phase was evaporated to an oily remainder and partitioned with hexane/ethyl acetate/aqueous sodium chloride solution. The hexane/ethyl acetate phase was further cleaned-up by partitioning with acetonitrile, followed by SPE on a C18 cartridge.

Final determination of metconazole was done LC-MS/MS using a C8 column and monitoring ion transition m/z 320→125. Quantitation was done with external standards in solvent.

Table 113 Recovery data for method RM–41M–2 measuring metconazole in animal matrices by LC-MS/MS using ion transitions m/z 320→125 and 320→70.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-metconazole	Liver	0.02	5	86	17	Green, 2006, METCON_083
		0.1	6	80	3.7	
trans-metconazole		0.02	5	87	17	
		0.1	6	81	3.6	
cis-metconazole	Eggs	0.02	3	86	1.3	Green, 2008, METCON_088
		0.1	3	87	0.6	
trans-metconazole		0.02	3	86	1.3	
		0.1	3	88	1.3	
cis-metconazole	Liver	0.02	5	80	2.6	Poperechna, 2018, METCON_090
		0.2	5	76	1.9	
	Muscle	0.02	5	77	7.2	
		0.2	5	91	11	
	Kidney	0.02	5	90	9.6	
		0.2	5	92	11	
	Fat	0.02	5	106	6.2	
		0.2	5	102	2.1	
	Eggs	0.02	5	85	11	
		0.2	5	93	5.2	
trans-metconazole	Liver	0.02	5	80	0.6	Stahl, 2018, METCON_091
		0.2	5	76	2.9	
	Muscle	0.02	5	76	7.3	
		0.2	5	91	12	
	Kidney	0.02	5	90	8.4	
		0.2	5	92	11	
	Fat	0.02	5	108	6.2	
		0.2	5	102	2.7	
	Eggs	0.02	5	84	9.5	
		0.2	5	90	4.1	

Table 114 Confirmatory recovery data for method RM–41M–2 measuring metconazole in animal matrices by LC-MS/MS using ion transition m/z 320→70.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
cis-metconazole	Liver	0.02	5	81	2.0	Poperechna, 2018, METCON_090 Stahl, 2018, METCON_091
		0.2	5	77	2.5	
	Muscle	0.02	5	77	7.5	
		0.2	5	91	11	
	Kidney	0.02	5	90	8.6	
		0.2	5	94	10	
	Fat	0.02	5	107	6.3	
		0.2	5	102	3.0	
	Eggs	0.02	5	87	12	

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
		0.2	5	93	4.4	
trans-metconazole	Liver	0.02	5	79	1.7	
		0.2	5	77	2.5	
	Muscle	0.02	5	77	7.6	
		0.2	5	91	12	
	Kidney	0.02	5	91	9.2	
		0.2	5	93	11	
	Fat	0.02	5	109	6.5	
		0.2	5	103	2.2	
	Eggs	0.02	5	85	11	
		0.2	5	89	2.3	

Method RM–41M–3

The method describes the determination of M–1 (conjugated + non-conjugated) and M–12 in kidney. Samples were homogenized with methanol, followed by methanol/water (9+1, v/v). The combined extracts were evaporated to the aqueous remainder, methanol and acetonitrile was added and the mixture was partitioned against hexane to remove fat. An aliquot of the acetonitrile/methanol layer was clean-up by SPE on C18 cartridge for the determination of metabolite M12. A second aliquot was hydrolysed with 3 mol/L HCl and as well cleaned-up by SPE on C18 cartridge determination of metabolite M1.

Final determination of metconazole was done LC-MS/MS using a C18 column and monitoring ion transition m/z 336→125 for M1 and m/z 350→125 for M12. Quantitation was done with external standards in solvent.

Table 115 Recovery data for method RM–41M–3 measuring metabolites M1 and M12 in kidney by LC-MS/MS.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
M1	Kidney	0.02	4	77	10	Green, 2006, METCON_083
		0.1	6	70	2.3	
M12		0.02	4	74	6.0	
		0.1	6	78	3.6	

Method RM–41M–3a

The method is a revised version of method RM–41M–3 describing the determination of M–1 and M–12 in animal matrices. Samples were homogenized with methanol/water (9+1, v/v), followed by filtration. An aliquot of the extract was added to acetonitrile and partitioned with hexane to clean up oils. The acetonitrile fraction was evaporated to dryness, brought up in methanol/water (5/1, v/v) and cleaned-up on a C18 SPE cartridge. The eluent was evaporated to dryness and reconstituted in methanol/water (2/1, v/v).

Final determination of metconazole was done LC-MS/MS using a C18 column and monitoring ion transitions m/z 336→125, 336→70 for M1 and m/z 350→125, 350→70 for M12. Quantitation was done with external standards in solvent.

Table 116 Recovery data for method RM–41M–3a measuring metabolites M1 and M12 in animal matrices by LC-MS/MS.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
M1 m/z 336→125	Liver	0.02	5	97	2,6	Bitter, 2018, METCON_092
		0.2	5	97	3.0	
	Kidney	0.02	5	94	1.6	
		0.2	5	96	2.5	
	Fat	0.02	5	93	4.1	
		0.2	5	94	1.3	
	Muscle	0.02	5	89	4.7	
		0.2	5	93	1.8	
M12 m/z 350→125	Liver	0.02	5	103	5.5	
		0.2	5	98	2.6	
	Kidney	0.02	5	95	3.4	
		0.2	5	101	1.2	
	Fat	0.02	5	101	7.1	
		0.2	5	101	1.7	
	Muscle	0.02	5	94	2.4	
		0.2	5	98	2.4	

Table 117 Confirmatory recovery data for method RM–41M–3a metabolites M1 and M12 in animal matrices by LC-MS/MS.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
M1 m/z 336→70	Liver	0.02	5	93	4.0	Bitter, 2018, METCON_092
		0.2	5	95	1.5	
	Kidney	0.02	5	92	2.8	
		0.2	5	96	0.7	
	Fat	0.02	5	93	2.7	
		0.2	5	94	1.1	
	Muscle	0.02	5	90	2.7	
		0.2	5	93	2.3	
M12 m/z 350→70	Liver	0.02	5	102	6.8	
		0.2	5	103	3.0	
	Kidney	0.02	5	96	2.1	
		0.2	5	101	1.2	
	Fat	0.02	5	103	7.5	
		0.2	5	102	2.4	
	Muscle	0.02	5	94	3.7	
		0.2	5	98	0.7	

Method L0415/01

The method describes the determination of 1,2,4 triazole in animal matrices. Samples were extracted with methanol/water (8+2, v/v). An aliquot of the extract is dosed with internal standard and treated with sodium bicarbonate and dansyl chloride for derivatization to dansyl–1,2,4-triazole. After addition of 0.5 mol/L ammonium hydroxide the residues are partitioned with ethyl acetate. The organic layer is dried over anhydrous sodium sulphate and the resulting solution is evaporated to dryness. Finally, the remainder is taken up in acetonitrile/water (3+7, v/v).

Final determination of metabolite 1,2,4 triazole was done LC-MS/MS using a C18 column and monitoring the ion transitions m/z 304→171 and 304→182. Quantitation was done with external standards in solvent.

Table 118 Recovery data for method L0415/01 measuring metabolite 1,2,4 triazole in animal matrices by LC-MS/MS using ion transition m/z 304→171.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
1,2,4 triazole	Liver	0.01	5	103	4.5	Jooss S., Tussetschlaeger, 2018, METCON_093
		0.1	5	94	2.7	
	Fat	0.01	5	101	2.2	
		0.1	5	101	2.5	
	Muscle [a]	0.01	5	85	8.1	
		0.1	5	96	4.3	
	Egg	0.01	5	96	5.5	
		0.1	5	93	4.6	

[a] Recoveries were corrected for apparent residues >20% of LOQ in blank control samples.

Table 119 Confirmatory recovery data for method L0415/01 measuring metabolite 1,2,4 triazole in animal matrices by LC-MS/MS using ion transition m/z 304→182.

Analyte	Matrix	Fortification level [mg/kg]	No of replicates	Mean recovery [%]	RSD [%]	Reference
1,2,4 triazole	Liver [a]	0.01	5	107	4.2	Jooss S., Tussetschlaeger, 2018, METCON_093
		0.1	5	110	2.3	
	Fat	0.01	5	107	1.3	
		0.1	5	108	0.8	
	Muscle [a]	0.01	5	101	4.4	
		0.1	5	107	1.5	
	Egg	0.01	5	105	2.3	
		0.1	5	102	7.6	

[a] Recoveries were corrected for apparent residues >20% of LOQ in blank control samples.

STABILITY OF PESTICIDE RESIS=DUES IN STORED ANALYTICAL SAMPLES

Plant matrices

The storage stability of *cis*- and *trans*-metconazole under frozen conditions in cereal grain was determined over a period up to 12 month. (Memmesheimer, 1997, METCON_094).

Each analyte was added to homogenized samples at a rate of 0.1 mg/kg, stored deep frozen at -18 °C and analysed after 0, 1, 3, 6, 9 and 12 month. All samples were analysed in triplicates according to method FAMS 050-01.

Table 120 Storage stability of *cis*- and *trans*-metconazole in wheat grain at 0.1 mg/kg

Storage period (month)	*cis*-metconazole		*trans*-metconazole	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
0	77	78	78	79
1	81	82	82	82
3	83	89	86	90
6	82	85	85	88
9	82	85	83	86
12	77	79	82	82

The storage stability of *cis*- and *trans*-metconazole under frozen conditions in incurred residues of cereal green plant and straw was determined over a period up to 12 month (Memmesheimer, 1997, METCON_095).

Samples were stored deep frozen at -18 °C and analysed after 0, 3, 6, 9 and 12 month. Day 0 samples were analysed in quintuplicates and for all other days in triplicates according to method FAMS 050-01.

Table 121 Storage stability of the sum of *cis*- and *trans*-metconazole in incurred residues of rye green plant and wheat straw

Storage period (month)	Rye green plant			Wheat straw		
	Measured residue (mg/kg)	Percent remaining (day zero normalised)	Mean concurrent recovery (%)	Measured residue (mg/kg)	Percent remaining (day zero normalised)	Mean concurrent recovery (%)
0	0.91	100	89	0.32	100	78
3	0.95	104	86	0.31	97	80
6	0.88	97	87	0.28	88	75
9	0.90	99	83	0.27	84	75
12	0.77	85	83	0.26	81	73

The storage stability of *cis*- and *trans*-metconazole under frozen conditions in rape seed and rape oil was determined over a period up to 12 month (Memmesheimer, 1997, METCON_096).

Each analyte was added to homogenized samples at a rate of 0.1 mg/kg, stored deep frozen at -18 °C and analysed after 0, 1, 3, 6, 9 and 12 month. All samples were analysed in triplicates according to method FAMS 059-02.

Table 122 Storage stability of *cis*- and *trans*-metconazole in rape seed and rape oil at 0.1 mg/kg

Storage period (month)	*cis*-metconazole		*trans*-metconazole	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
Rape seed				
0	80	80	79	80
1	64	80	64	81
3	79	91	80	93
6	78	84	81	87
9	74	91	78	95
12	73	89	75	93
Rape oil				
0	98	99	97	100
1	96	96	96	96
3	99	99	98	98
6	95	99	96	98
9	95	94	98	95
12	94	95	94	95

The storage stability of *cis*- and *trans*-metconazole under frozen conditions in carrots and lettuce was determined over a period up to 12 month (Memmesheimer, 1997, METCON_097).

Each analyte was added to homogenized samples at a rate of 0.1 mg/kg, stored deep frozen at -18 °C and analysed after 0, 1, 3, 6, 9 and 12 month. All samples were analysed in triplicates according to method FAMS 057-01.

Table 123 Storage stability of *cis*- and *trans*-metconazole in carrots and lettuce fortified at 0.1 mg/kg.

Storage period (month)	*cis*-metconazole		*trans*-metconazole	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
Carrots				
0	89	89	91	92
1	78	88	80	90
3	86	91	86	92
6	82	93	83	94
9	79	88	81	89
12	78	91	77	91
Lettuce				
0	89	78	87	75
1	95	96	94	95
3	93	88	85	83
6	93	93	94	93
9	85	86	84	85
12	96	98	96	99

The storage stability of *cis*- and *trans*-metconazole under frozen conditions in incurred residues of pea straw and pea seed fortified at 0.1 mg/kg was determined over a period up to 12 month (Müller, 1998, METCON_098).

Samples were stored deep frozen at -18 °C and analysed after 0, 2, 6, 9 and 12 month. All samples were analysed in triplicates according to method FAMS 069-01.

Table 124 Storage stability of *cis*- and *trans*-metconazole in pea seed fortified at 0.1 mg/kg.

Storage period (month)	*cis*-metconazole		*trans*-metconazole	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
0	97	86	97	85
2	100	99	100	103
6	90	94	90	95
9	83	102	87	101
12	87	102	87	102

Table 125 Storage stability of the sum of *cis*- and *trans*-metconazole in incurred residues of pea straw.

Storage period (month)	Measured residue (mg/kg)	Percent remaining (day zero normalised)	Mean concurrent recovery (%)
0	1.17	100	97
3	1.07	91	98
6	1.14	97	91
9	1.08	92	90
12	1.07	91	95

The storage stability of *cis*- and *trans*-metconazole under frozen conditions in blueberries fortified at 2 mg/kg was determined over a period up to 281 days (9.4 month) (Thompson, 2010, METCON_100). Samples were stored deep frozen at -20 °C and analysed in triplicates according to method RM–41C–1.

Table 126 Storage stability of *cis*- and *trans*-metconazole in blueberries fortified at 2 mg/kg

Storage period (month)	*cis*-metconazole		*trans*-metconazole	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
9.4	84	91	84	95

The storage stability of *cis*- and *trans*-metconazole under frozen conditions in potatoes fortified at 2 mg/kg was determined over a period up to 959 days (approx. 31 month) (Corley, 2010, METCON_101). Samples were stored deep frozen at -20 °C and analysed in triplicates according to method RM–41C–1.

Table 127 Storage stability of *cis*- and *trans*-metconazole in potatoes fortified at 2 mg/kg

Storage period (month)	*cis*-metconazole		*trans*-metconazole	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
31	101	100	102	101

The storage stability of *cis*- and *trans*-metconazole under frozen conditions in dried peas fortified at 0.1 mg/kg was determined over a period up to 225 days (approx. 7.5 month) (Green, 2010, METCON_102). Samples were stored deep frozen at -20 °C and analysed in duplicate according to method RM–41C–1 after 0, 1, 2, 3, 4, 5, 6 and 7.5 months.

Table 128 Storage stability of *cis*- and *trans*-metconazole in dried peas fortified at 0.1 mg/kg.

Storage period (month)	*cis*-metconazole		*trans*-metconazole	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
0	94	94	96	101
1	89	92	92	93
2	90	96	91	98
3	91	90	93	87
4	85	100	85	102
5	83	93	86	95
7.5	90	102	91	102

The storage stability of *cis*- and *trans*-metconazole under frozen conditions in dried pea fortified at 0.2 mg/kg was determined over a period up to 419 days (approx. 14 month) (Corley, 2013, METCON_103). Samples were stored deep frozen at -20 °C and analysed in triplicates according to method RM–41C–1.

Table 129 Storage stability of *cis*- and *trans*-metconazole in dried peas fortified at 0.2 mg/kg.

Storage period (month)	*cis*-metconazole		*trans*-metconazole	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
14	88	83	79	92

The storage stability of *cis*- and *trans*-metconazole and metabolites M21, M11, M30, triazole, triazolyl alanine and triazolyl acetic acid under frozen conditions in wheat (grain, straw, hay), soya bean (seed), radish or sugar beet (tops and roots) was determined over a period up to 26 month (Gooding & Saha, 2008, METCON_099).

Each analyte was added to homogenized samples at a rate of 0.1 mg/kg, stored deep frozen at about -20 °C and analysed after 0, 1, 3, 6, 12 and 26 months. All samples were analysed in duplicate or quadruplicate according to method D0508.

Table 130 Storage stability of *cis*-metconazole in wheat hay, soya bean seed and radish roots

Storage period (month)	Wheat hay		Soya bean seed		Radish roots	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
0	95	93	98	106	89	91
1	87		n/a	n/a	91	
3	78	86	86	106	81	77

Storage period (month)	Wheat hay		Soya bean seed		Radish roots	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
6	89	94	83	98	82	99
12	78	87	86	88	92	88
26	71	76	76	68	68	87

Table 131 Storage stability of *trans*-metconazole in wheat hay, soya bean seed and radish roots

Storage period (month)	Wheat hay		Soya bean seed		Radish roots	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
0	87	94	103	105	90	87
1	85		n/a	n/a	96	
3	89	83	85	105	99	84
6	95	100	91	100	94	96
12	89	81	95	86	106	83
26	78	83	83	70	75	91

Table 132 Storage stability of M11 in wheat grain, wheat hay, wheat straw, soya bean seed, sugar beet roots and radish tops

Storage time (months)	Wheat grain		Wheat hay		Wheat straw		Soya bean seed		Sugar beet roots		Radish tops	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
0	91	93	102	96	96	98	101	100	95	92	92	100
1	96		86		85		n/a	n/a	91		89	
3	96	104	96	91	108	102	83	100	106	98	96	111
6	113	131	103	95	106	94	108	92	133	121	100	90
12	103	97	96	83	93	88	90	85	89	92	86	90
26	82	94	78	82	68	72	67	69	110	120	90	85

Table 133 Storage stability of M21 in wheat grain, wheat hay, wheat straw, soya bean seed, sugar beet roots and radish tops

Storage time (months)	Wheat grain		Wheat hay		Wheat straw		Soya bean seed		Sugar beet roots		Radish tops	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
0	96	92	88	90	96	89	111	105	82	89	90	85
1	96		86		87		n/a	n/a	90		94	
3	104	92	101	81	114	98	104	105	103	109	98	102
6	108	112	98	92	100	103	109	98	109	112	91	104
12	180	103	157	87	157	100	167	95	166	98	148	100
26	111	91	98	76	96	76	88	71	108	102	123	101

Table 134 Storage stability of M30 in wheat grain, wheat hay, wheat straw, soya bean seed, sugar beet roots and radish tops.

Storage time (months)	Wheat grain		Wheat hay		Wheat straw		Soya bean seed		Sugar beet roots		Radish tops	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
0	97	101	92	94	94	99	101	110	91	92	91	99
1	86		89		92		N/A	N/A	83		91	
3	117	113	104	96	81	96	93	110	103	100	78	88
6	128	115	95	97	100	93	94	105	108	115	112	98
12	114	92	87	91	91	91	88	83	93	87	111	84
26	70	89	61	71	55	72	61	76	68	81	63	74

Table 135 Storage stability of triazole in soya bean seed, radish roots and tops

Storage period (month)	Soya bean seed		Radish roots		Radish tops	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
0	68	69	98	115	122	122
1	n/a	n/a	101	n/a	116	
3	61	69	78	79	72	81
6	91	115	81	77	90	85
12	78	97	73	87	93	90
26	59	85	58	97	73	104

Table 136 Storage stability of triazolyl alanine in wheat grain, soya bean seed, radish roots and tops

Storage period (month)	Wheat grain		Soya bean seed		Radish roots		Radish tops	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
0	117	121	74 68[1]	71 67 [a]	104	96	110	122
1	125		n/a	n/a	80		106	
3	88	81	76 80[1]	71 67 [a]	101	86	81	69
6	64	91	101	85	111	104	102	111
12	114	113	87	86	115	102	106	104
26	78	67	83	71	100	93	91	91

[a] Recovery determined after hydrolysis

Table 137 Storage stability of triazolyl acetic acid in wheat grain, soya bean seed, radish roots and tops

Storage period (month)	Wheat grain		Soya bean seed		Radish roots		Radish tops	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
0	90	92	95	101	110	119	108	99
1	89		n/a	n/a	108		104	
3	83	75	87	101	93	96	95	101
6	56	80	92	102	106	106	90	103
12	88	101	75	92	101	92	88	98
26	93	104	73	78	101	87	67	83

Animal matrices

The storage stability of *cis*- and *trans*-metconazole under frozen conditions in muscle, fat and liver fortified at 0.1 mg/kg was determined over a period of 108–112 days (approx. 3 month) (Green, 2006, METCON_104). Samples were stored deep frozen at -20 °C and analysed in duplicate according to methods RM–41M–2 and RM–41M–3.

Table 138 Storage stability of *cis*- and *trans*-metconazole in animal matrices fortified at 0.1 mg/kg.

Storage period (month)	*cis*-metconazole		*trans*-metconazole	
	Mean remaining (%)	Mean concurrent recovery (%)	Mean remaining (%)	Mean concurrent recovery (%)
Muscle				
0	86	n/a	86	n/a
112	60	79	64	83
Fat				
0	83	n/a	83	n/a
111	80	83	82	82
Liver				
0	86	n/a	87	n/a
108	65	82	67	85

The storage stability of metconazole metabolite M1 in liver, kidney, muscle, and fat, and M12 in liver and kidney under frozen conditions fortified at 0.1 mg/kg was determined over a period of 241–267 days (approx. 8–9 month) (Bitter & Kowalsky, 2019, METCON_175). Samples were stored deep frozen at -20 °C and analysed in duplicate according to method RM–41M–3a.

Table 139 Storage stability of metabolite M1 in liver, kidney, muscle, and fat

Storage time (months)	Liver		Kidney		Muscle		Fat	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
0	94	93	95	89	93	93	96	90
2	102	98	81	92	94	97	97	96
4	97	94	65	92	88	94	88	92
7	-	-	94	99	94	91	88	93
8	95	78	79	87	104	96	85	85
9	100	95	-	-	-	-	-	-

Table 140 Storage stability of metabolite M12 in liver and kidney

Storage time (months)	Liver		Kidney	
	Percent remaining	Mean concurrent recovery (%)	Percent remaining	Mean concurrent recovery (%)
0	93	91	100	97
2	97	98	95	94
4	98	94	89	96
7	106	84	96	101
8	-	-	103	92
9	100	100	-	-

USE PATTERN

Metconazole is a systemic triazole fungicide and plant growth regulator for the control of a broad range of important pathogens. In the following table, GAP information taken from the submitted labels, for all crops supported with residue data is summarized in Table 141.

Table 141 List of uses of metconazole

Crop/ Commodity	Country	Formulation		Application				PHI (days)
		Active substance content	Type	Method	Rate	Water volume	No or Seasonal max. (interval)	
Stone Fruits (Crop Group 12–12) [a]	USA	425 g/kg	SC	Foliar spray	140 g ai/ha	935–3700 L/ha Aerial: >94 L/ha	3 (at full bloom, petal fall and pre-harvest)	14
		500 g/kg	WDG					
Bushberries [b]	USA	480 g/L	SC	Foliar spray	87 g ai/ha	>187 L/ha Aerial: >94 L/ha	3 (applied at flowering and pre-harvest with no more than two sequential applications)	7
		500 g/kg	WDG					
Blueberries	Canada	500 g/kg	WDG	Foliar spray	90 g ai/ha	>200 L/ha	3 (7 days)	7
Banana	Mexico	90 g/L	EC	Foliar spray	72–90 g ai/ha	125 L/ha	3 (14 days)	0
Onion	Brazil	90 g/L	SL	Foliar spray	45–90 g ai/ha		3 (7 days)	14
Onion	Mexico	90 g/L	EC	Foliar spray	68–113 g ai/ha		5 (7 days)	30
Garlic	Brazil	90 g/L	SL	Foliar spray	45–90 g ai/ha		3 (7 days)	14
Garlic	Chile	90 g/L	SL	Foliar spray	90 g ai/ha	200–400 L/ha	2 (30 days)	30
Green beans	Brazil	90 g/L	SL	Foliar spray	6.8–14 g ai/ha	150 L/ha	3 (7 days)	15
Dried Shelled Pea and Bean except Soya bean (Crop Subgroup 6C) [c]	USA	480 g/L	SC	Foliar spray	90–140 g ai/ha	>187 L/ha Aerial: >47 L/ha	2 (7 days)	21
		500 g/kg	WDG					
Dry bean, field pea, chickpea, lentil (Crop Subgroup 6C)	Canada	500 g/kg	WDG	Foliar spray	140 g ai/ha	200 L/ha Aerial: 50 L/ha	2 (min. 7 days)	21
Beans	Brazil	90 g/L	SL	Foliar spray	45–90 g ai/ha		3 (10 days)	15
Soya beans	Brazil	90 g/L	SL	Foliar spray	45–54 g ai/ha		3 (20 days)	14
Soya beans	Canada	90 g/L	EC	Foliar spray	63 g ai/ha	>100 L/ha Aerial: >50 L/ha	2 (10 days)	30
Soya beans	Columbia	80 g/L	EC	Foliar spray	40–60 g ai/ha		2 (10 days)	14
Soya beans	USA	90 g/L	EC	Foliar spray	54–63 g ai/ha		2 (10 days)	30 (no livestock feeding restrictions for soya bean forage and hay)

Crop/ Commodity	Country	Formulation		Application				PHI (days)
		Active substance content	Type	Method	Rate	Water volume	No or Seasonal max. (interval)	
Tuberous and Corm Vegetables (Crop Subgroup 1C)[Potato] [d]	USA	480 g/L 500 g/kg	SC WDG	Foliar spray	87–140 g ai/ha	94 L/ha Aerial: >47 L/ha	4 (7 days)	1
Potato	Brazil	90 g/L	SL	Foliar spray	90 g ai/ha		3 (7 days)	14
Potato	Chile	90 g/L	SL	Foliar spray	90 g ai/ha	200–400 L/ha	2 (15 days)	30
Potato	Canada	500 g/kg	WDG	Foliar spray	140 g ai/ha	200 L/ha Aerial: 50 L/ha	3 (7 days)	1
Potato	Mexico	90 g/L	EC	Foliar spray	68–113 g ai/ha		5 (7 days)	30
Sugar beet	Canada	90 g/L	EC	Foliar spray	90–113 g ai/ha	100 L/ha Aerial: 50 L/ha	2 (14 days)	14 (no livestock feeding restrictions)
Sugar beet	Chile	90 g/L	SL	Foliar spray	90 g ai/ha	200–400 L/ha	2 (15 days)	42
Sugar beet	USA	90 g/L	EC	Foliar spray	59–112 g ai/ha	Not stated	2 (14 days	14
Cereals (barley, wheat, triticale, rye)	Canada	80 g/L	EC	Foliar spray	91 g ai/ha	100 L/ha Aerial: 50 L/ha	2 (10 days)	Apply no later than the end of flowering
Cereals (barley, oat, wheat, rye)	Mexico	90 g/L	EC	Foliar spray	68–90 g ai/ha	200–300 L/ha	1	30
Cereals (barley, wheat, triticale, rye)	United Kingdom	90 g/L	EC	Foliar spray	90 g ai/ha	200–300 L/ha	2 (21 days)	Up and including GS71
Cereals (barley, oat, wheat, triticale, rye)	USA	90 g/L	EC	Foliar spray	89–112 g ai/ha		2 (6 days)	30 (no livestock feeding restrictions for hay and straw)
Wheat	Brazil	80 g/L	EC	Foliar spray	40–60 g ai/ha		2 (not stated)	30
Wheat	Chile	90 g/L	SL	Foliar spray	90 g ai/ha	200 L/ha	2 (30–35 days)	42
Barley	Brazil	80 g/L	EC	Foliar spray	40–80 g ai/ha		2 (20–28 days)	30
Oat	Brazil	80 g/L	EC	Foliar spray	40–80 g ai/ha		2 (21–28 days)	30
Maize	Brazil	80 g/L	EC	Foliar spray	40–60 g ai/ha		2 (not stated)	45
Maize	Canada	90 g/L	EC	Foliar spray	90 g ai/ha	100 L/ha Aerial: 50 L/ha	1	20

Crop/ Commodity	Country	Formulation		Application				PHI (days)
		Active substance content	Type	Method	Rate	Water volume	No or Seasonal max. (interval)	
Maize	Columbia	80 g/L	EC	Foliar spray	60 g ai/ha		2 (not stated)	14
Maize	Mexico	80 g/L	EC	Foliar spray	40–68 g ai/ha		2 (14 days)	45
Maize	USA	90 g/L	EC	Foliar spray	92 g ai/ha		4 (7 days)	7 (forage, sweet corn) 20 (field corn grain, stover)
Sweet corn	Canada	90 g/L	EC	Foliar spray	90 g ai/ha	100 L/ha Aerial: 50 L/ha	1	7 (mechan. harvesting) 18 (hand harvesting)
Sweet corn	USA	90 g/L	EC	Foliar spray	92 g ai/ha		4 (7 days)	7
Sugar cane	USA	80 g/L	EC	Foliar spray	70–91 g ai/ha		4 (14 days)	14
Tree Nuts except Filbert, Pecan and Pistachio (Crop Group 14–12) [e]	USA	500 g/kg	WDG	Foliar spray	87–123 g ai/ha	933–3735 L/ha Aerial: >93 L/ha	4 (7 days)	25
Pecans, filberts	USA	500 g/kg	WDG	Foliar spray	87–123 g ai/ha	933–3735 L/ha Aerial: >93 L/ha	4 (7 days pecans; 14 days filberts)	25
Pistachios	USA	500 g/kg	WDG	Foliar spray	140 g ai/ha	933–3735 L/ha Aerial: >93 L/ha	4 (14 days)	25
Rapeseed (Crop Subgroup 20A)[Canola] [f]	USA	480 g/L	SC	Foliar spray	70–140 g ai/ha	93–187 L/ha Aerial: >47 L/ha	1	35
		500 g/kg	WDG					
Oilseed rape	Canada	500 g/kg	WDG	Foliar spray	70–140 g ai/ha	200 L/ha Aerial: 50 L/ha	1	45
Oilseed rape	Chile	90 g/L	SL	Foliar spray	90 g ai/ha	100–200 L/ha Aerial: 40–60 L/ha	2 (not stated)	42
Oilseed rape	United Kingdom	90 g/L	EC	Foliar spray	72 g ai/ha	200–400 L/ha	2 (14 days)	10% of pods at final size
Crop Subgroup 20B, including sunflower [g]	Canada	500 g/kg	WDG	Foliar spray	140 g ai/ha	100–200 L/ha Aerial: 50 L/ha	2 (7 days)	21
Sunflower	USA	480 g/L	SC	Foliar	87–140 g	187	2 (7 days)	21

Crop/ Commodity (Crop Subgroup 20B)[g]	Country	Formulation		Application				PHI (days)
		Active substance content	Type	Method	Rate	Water volume	No or Seasonal max. (interval)	
		500 g/kg	WDG	spray	ai/ha	L/ha Aerial: >47 L/ha		
Cotton	Brazil	90 g/L	SL	Foliar spray	54–63 g ai/ha		3 (14 days)	14
Cotton	USA	90 g/L	EC	Foliar spray	53–92 g ai/ha		3 (7 days)	30
Peanut	Brazil	90 g/L	SL	Foliar spray	45–68 g ai/ha		3 (14 days)	7
Peanut	USA	480 g/L	SC	Foliar spray	87–140 g ai/ha	93–187 L/ha Aerial: >47 L/ha	4 (14 days)	14
		500 g/kg	WDG					

[a] Black cherry; capulin; Chinese Jujube; Nanking cherry; sweet cherry; tart cherry, apricot; Japanese apricot; nectarine and peach, American plum; beach plum; Canada plum; cherry plum; Chickasaw plum; Damson plum; Japanese plum; Klamath plum; plum; plumcot; prune plum; sloe, cultivars varieties and/or hybrids of these.

[b] Aronia berry; blueberry, highbush; blueberry, lowbush; buffalo currant; Chilean guava; cranberry, highbush; currant, black; currant, red; elderberry; European barberry; gooseberry; honeysuckle, edible; huckleberry; jostaberry; Juneberry (Saskatoon berry); lingonberry; native currant; salal; sea buckthorn; cultivars, varieties and/or hybrids of these.

[c] Dried cultivars of bean (Lupinus); bean (Phaseolus) (includes field bean, kidney bean, lima bean (dry), navy bean, pinto bean, tepary bean); bean (Vigna) (includes adzuki bean, blackeyed pea, catjang, cowpea, crowder pea, moth bean, mung bean, rice bean, southern pea, urd bean); broad bean (dry); chickpea; guar; lablab bean; lentil; pea (Pisum) (includes field pea); pigeon pea

[d] Arracacha; arrowroot; artichoke, Chinese; artichoke, Jerusalem; canna, edible; cassava, (bitter and sweet); chayote (root); chufa; dasheen (taro); ginger; leren; potato; sweet potato; tanier; turmeric; yam bean; yam, true

[e] African nut-tree; almond; beechnut; black walnut; Brazil nut; Brazilian pine; bunya; bur oak; butternut; Cajou nut; candlenut; cashew; chestnut; chinquapin; coconut; coquito nut; dika nut; English walnut; ginkgo; Guiana chestnut; heartnut; hickory nut; Japanese horse-chestnut; macadamia nut;

mongongo nut; monkey-pot; monkey puzzle nut; Okari nut; Pachira nut; peach palm nut; pequi; Pili nut; pine nut; Sapucaia nut; tropical almond; yellowhorn; cultivars varieties and/or hybrids of these.

[f] Borage; crambe; cuphea; echium; flax seed; gold of pleasure; hare's ear mustard; lesquerella; lunaria; meadowfoam; milkweed; mustard seed; oil radish; poppy seed; rapeseed; sesame; sweet rocket; cultivars, varieties and/or hybrids of these

[g] Calendula; castor oil plant; euphorbia; evening primrose; Niger seed; rose hip; safflower; stokes aster; sunflower; cultivars, varieties and/or hybrids of these

RESULTS OF SUPERVISED RESIDUE TRIALS ON CROPS

Residue levels were reported as measured. Application rates were always reported as metconazole equivalents. When residues were not detected they are shown as below the LOQ, e.g., < 0.01 mg/kg. Application rates, spray concentrations and mean residue results have generally been rounded to two significant figures. Values from the trials conducted according to maximum GAP have been used for the estimation of maximum residue levels. These results are underlined.

Laboratory reports included method validation including batch recoveries with spiking at residue levels similar to those occurring in samples from the supervised trials. Dates of analyses or duration of residue sample storage were also provided. Field reports provided data on the sprayers used and their calibration, plot size, residue sample size and sampling date. Although trials included control plots, no control data are recorded in the tables except where residues in control samples exceeded the LOQ. Residue data are recorded unadjusted for % recovery.

The isomeric ratio of *cis*- and *trans*-metconazole is at about 85:15. During soil degradation studies and in animal metabolism studies a preferred metabolism of the *cis*-isomer was observed, shifting the ratio towards the *trans*-isomer. Therefore, in order to cover this shift in the isomeric ratio, the sum of both isomers was used for the calculation of metconazole residues.

Table 142 Metconazole – supervised residue trials

Commodity	Indoor/Outdoor	Treatment	Countries	Table no
Stone fruit (peach, plum, cherry)	Outdoor	Foliar spray	USA	143-145
Blueberries	Outdoor	Foliar spray	Canada, USA	146
Banana	Outdoor	Foliar spray	Costa Rica, Ecuador, Honduras, Mexico	147
Onion	Outdoor	Foliar spray	Brazil	148
Garlic	Outdoor	Foliar spray	Brazil	149
Green beans	Outdoor	Foliar spray	Brazil	150
Dry beans	Outdoor	Foliar spray	Canada, USA	151-153
Dry pea	Outdoor	Foliar spray	Canada, USA	154-156
Soya bean	Outdoor	Foliar spray	Brazil, USA	157-160
Potato	Outdoor	Foliar spray	USA	161, 162
Sugar beet	Outdoor	Foliar spray	USA	163
Wheat	Outdoor	Foliar spray	Canada, USA	164-166
Rye	Outdoor	Foliar spray	Canada, USA	167-169
Barley	Outdoor	Foliar spray		170-172
Oat	Outdoor	Foliar spray		173-175
Maize	Outdoor	Foliar spray	USA	176
Sweet corn	Outdoor	Foliar spray	USA	178, 179
Sugar cane	Outdoor	Foliar spray	USA	180
Pecan	Outdoor	Foliar spray	USA	181
Almonds	Outdoor	Foliar spray	USA	182
Oilseed rape	Outdoor	Foliar spray	France, USA	183-185
Sunflower	Outdoor	Foliar spray	Canada, USA	186, 187
Cotton seed	Outdoor	Foliar spray	USA	188, 189
Peanut	Outdoor	Foliar spray	USA	190

Stone fruit

Peach

A total of 12 field trials were conducted with peaches in the USA in the 2003–2005 growing seasons (Green, 2006, METCON_105). Four trials from 2003 received 4 spray applications and had a PHI of

7 days. These trials were considered as supplemental and are not reported here. The remaining 8 trials conducted in 2004 and 2005 received three applications (at full bloom, petal fall and 14 ± 1 day before harvest). Application rates ranged between 150–160 g ai/ha. Among these trials was also one decline trial where samples were also collected at 10, 18 and 22 days after the last application. Residues of *cis*- and *trans*-metconazole were determined using method RM–41C–1 with a limit of quantification of 0.02 mg/kg. Overall mean procedural recoveries for *cis*- and *trans*-metconazole in peaches spiked at 0.02–0.2 mg/kg were 96 ± 6.0% (n = 18) and 97 ± 9.8% (n = 18), respectively.

Table 143 Residues of *cis*- and *trans*-metconazole in peaches following foliar treatment (cGAP USA: 3×140 g ai/ha; 14 day PHI).

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
USA, 2004, Ottawa, MI, (Bellaire)	150 150 150	- 10 81	1103 1150 1159	BBCH 75–79	Fruit	14	0.020 0.030 (0.025)	< 0.02 < 0.02 (< 0.02)	0.040 0.050 (0.045)	2006/1052077 V–25662-04-F METCON_105 Max. frozen storage: 2 month
USA, 2004, Athens, GA, (Redskin)	150 150 150	- 8 117	1197 1291 1001	BBCH 81	Fruit	14	< 0.02 0.030 (0.025)	< 0.02 < 0.02 (< 0.02)	< 0.04 0.050 (0.045)	2006/1052077 V–25662-04-G METCON_105 Max. frozen storage: 2 month
	300 300 300	- 8 117	1206 1272 1001	BBCH 81	Fruit	14	0.13 0.090 (0.110)	0.020 0.020 (0.020)	0.15 0.11 (0.13)	
USA, 2004, Porterville, CA, (Brittany Lane)	160 150 150	- 13 61	1038 1030 1319	BBCH 81–85	Fruit	14	0.070 0.060 (0.065)	0.020 < 0.02 (0.020)	0.090 0.080 (0.085)	2006/1052077 V–25662-04-H METCON_105 Max. frozen storage: 2 month
USA, 2004, Live Oak, CA, (Loadel)	150 150 150	- 8 91	1029 1029 1320	BBCH 85	Fruit	14	0.020 0.020 (0.020)	< 0.02 < 0.02 (< 0.02)	0.040 0.040 (0.040)	2006/1052077 V–25662-04-I METCON_105 Max. frozen storage: 1 month
USA, 2004, Marysville, CA, (Stanislaus)	150 150 150	- 7 87	1038 1038 1029	Not reported	Fruit	14	0.030 0.030 (0.030)	< 0.02 < 0.02 (< 0.02)	0.050 0.050 (0.050)	2006/1052077 V–25662-04-J METCON_105 Max. frozen storage: 1 month
USA, 2004, Chula, CA, (June Gold)	150 150 150	- 9 50	1282 1020 973	BBCH 75	Fruit	10 14 18 22	0.080 0.080 (0.080) 0.050 0.030 (0.040) 0.030 0.020 (0.025) 0.020 0.020 (0.020)	0.020 0.020 (0.020) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02)	0.10 0.10 (0.10) 0.070 0.050 (0.060) 0.050 0.040 (0.045) 0.040 0.040 (0.040)	2006/1052077 V–25662-04-K METCON_105 Max. frozen storage: 3 month
USA, 2004, Waller, TX, (Texas Royal)	150 150 160	- 15 55	1020 1010 1001	BBCH 81	Fruit	14	0.020 0.030 (0.025)	< 0.02 < 0.02 (< 0.02)	0.040 0.050 (0.045)	2006/1052077 V–25662-04-L METCON_105 Max. frozen storage: 2 month

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
USA, 2005, Orefield, PA, (Garnet Beauty)	160 160 150 (1.81 FL)	- 3 80	1141 1141 1029	BBCH 89	Fruit	13	0.020 0.020 (0.020)	< 0.02 < 0.02 (< 0.02)	0.040 0.040 (0.040)	2006/1052077 V–25662-05-M METCON_105 Max. frozen storage: 3 month
	160 150 150 (50 WDG)	- 3 80	1188 1131 1038	BBCH 89	Fruit	13	0.020 0.020 (0.020)	< 0.02 < 0.02 (< 0.02)	0.040 0.040 (0.040)	

[a] Results from two replicate field samples are presented and values in parentheses represent mean values

Plum

A total of eight field trials were conducted with plums in the USA in the 2003–2005 growing seasons (Green, 2006, METCON_106). Four trials from 2003 received 4 spray applications and had a PHI of 7 days. These trials were considered as supplemental and are not reported here. The remaining 5 trials conducted in 2004 and 2005 received three applications (at full bloom, petal fall and 14 ± 1 day before harvest). Application rates ranged between 150–160 g ai/ha. Residues of *cis*- and *trans*-metconazole were determined using method RM–41C–1with a limit of quantification of 0.02 mg/kg. Overall mean procedural recoveries for *cis*- and *trans*-metconazole in plums spiked at 0.02–0.25 mg/kg were 95 ± 5.1% (n = 18) and 96 ± 7.5% (n = 18), respectively.

Table 144 Residues of *cis*- and *trans*-metconazole in plums following foliar treatment (cGAP USA: 3×140 g ai/ha; 14 day PHI).

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
USA, 2004, Selma, CA, (Howard Sun)	150 150 150	- 7 129	1225 1244 1234	BBCH 81	Fruit	14	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2006/1052075 V–25671-04-E METCON_106 Max. frozen storage: 2 month
USA, 2004, Kerman, CA, (French Prune)	150 150 150	- 7 119	1225 1207 1225	BBCH 87	Fruit	14	0.02 0.03 (0.025)	< 0.02 < 0.02 (< 0.02)	0.04 0.05 (0.045)	2006/1052075 V–25671-04-F METCON_106 Max. frozen storage: 2 month
	764 759 766	- 7 119	1225 1216 1225	BBCH 87	Fruit	14	0.12 0.12 (0.12)	0.03 0.03 (0.030)	0.15 0.15 (0.15)	
USA, 2004, Hickman, CA, (Grand Rosa)	160 160 150	- 6 133	1188 1132 1113	BBCH 87	Fruit	14	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2006/1052075 V–25671-04-G METCON_106 Max. frozen storage: 1 month
USA, 2004, Live Oak, CA, (French)	150 150 150	- 5 109	966 978 973	BBCH 85	Fruit	14	0.02 0.02 (0.02)	< 0.02 < 0.02 (< 0.02)	0.04 0.04 (0.04)	2006/1052075 V–25671-04-H METCON_106 Max. frozen storage: 1 month
USA, 2005,	150	-	1123	BBCH	Fruit	14	0.02	< 0.02	0.04	2006/1052075

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
Dallas, OR, (Moyer)	150 150 (1.81 FL)	17 126	1104 1104	85			< 0.02 (0.02)	< 0.02 (< 0.02)	< 0.04 (0.04)	V–25671-05-J METCON_106 Max. frozen storage: 2 month
	150 150 150 (50 WDG)	- 17 126	1123 1123 1113	BBCH 85	Fruit	14	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	

[a] Results from two replicate field samples are presented and values in parentheses represent mean values

Cherry

A total of 10 field trials were conducted with cherries in the USA in the 2003–2005 growing seasons (Green, 2006, METCON_107). Two trials from 2003 received 4 spray applications and had a PHI of 7 days. These trials were considered as supplemental and are not reported here. Of the remaining 8 trials were 7 conducted in 2004 and 2005 and received three applications (at full bloom, petal fall and 14 ± 1 day before harvest). Application rates ranged between 150–160 g ai/ha with a PHI of 13–14 days. Additionally, one decline trial from 2003 receiving 4 applications is provided where samples were taken at 3, 6, 10 and 13 DALA. Residues of *cis*- and *trans*-metconazole were determined using method RM–41C–1with a limit of quantification of 0.02 mg/kg. Overall mean procedural recoveries for *cis*- and *trans*-metconazole in cherries spiked at 0.02–0.75 mg/kg were 97 ± 5.8% (n = 20) and 98 ± 7.8% (n = 20), respectively.

Table 145 Residues of *cis*- and *trans*-metconazole in cherries following foliar treatment (cGAP USA: 3×140 g ai/ha; 14 day PHI).

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
USA, 2003, Conklin, MI, (Montmorency)	150 150 150 150	- 7 44 7	1093 1051 1109 1088	90% red colour	Fruit	3 6 10 13	0.27 0.25 (0.26) 0.17 0.15 (0.16) 0.07 0.07 (0.07) 0.03 0.03 (0.03)	0.07 0.06 (0.07) 0.04 0.04 (0.04) 0.02 0.02 (0.02) < 0.02 < 0.02 (< 0.02)	0.33 0.31 (0.32) 0.21 0.19 (0.20) 0.09 0.09 (0.09) 0.05 0.05 (0.05)	2006/1052076 V–25654-03-B METCON_107 Max. frozen storage: 5 month
USA, 2004, Conklin, MI, (Montmorency)	150 150 150	- 10 44	1107 1169 1163	80% red colour	Fruit	14	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2006/1052076 V–25654-04-D METCON_107 Max. frozen storage: 2 month
USA, 2004, Parkdale, OR, (Bing)	160 150 160	- 9 69	1217 1235 1228	Advanced fruit colouring	Fruit	10 14 18	0.05 0.06 (0.06) 0.05 0.04 (0.05) 0.03	< 0.02 0.02 (0.02) < 0.02 < 0.02 (< 0.02) < 0.02	0.07 0.08 (0.08) 0.07 0.06 (0.07) 0.05	2006/1052076 V–25654-04-E METCON_107 Max. frozen storage: 2 month

Location, Year (variety)	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Residues (mg/kg) [a] Sample	DALA	Metconazole *cis*-	Metconazole *trans*-	Metconazole Total	Report/Trial No., Reference, Storage period
							0.02	< 0.02	0.04	
							(0.03)	(< 0.02)	(0.05)	
						22	0.02	< 0.02	0.04	
							0.02	< 0.02	0.04	
							(0.02)	(< 0.02)	(0.04)	
USA, 2004, The Dalles, OR, (Bing)	150 150 160	- 9 50	994 972 973	Red fruit	Fruit	14	0.05 0.04 (0.05)	0.02 < 0.02 (0.02)	0.07 0.05 (0.06)	2006/1052076 V–25654-04-F METCON_107 Max. frozen storage: 3 month
USA, 2004, Denair, CA, (Bing)	150 150 150	- 10 29	1232 1267 1264	Beginning of fruit colouring	Fruit	10	0.05 0.05 0.06 0.06 (0.06)	< 0.02 < 0.02 < 0.02 < 0.02 (< 0.02)	0.07 0.07 0.08 0.08 (0.08)	2006/1052076 V–25654-04-G METCON_107 Max. frozen storage: 5 month
						14	0.06 0.05 0.07 0.07 (0.07)	< 0.02 < 0.02 0.02 < 0.02 (0.02)	0.08 0.08 0.09 0.09 (0.09)	
						18	0.05 0.05 (0.05)	< 0.02 < 0.02 (< 0.02)	0.07 0.07 (0.07)	
						22	0.04 0.04 (0.04)	< 0.02 < 0.02 (< 0.02)	0.06 0.06 (0.06)	
USA, 2004, Kerman, CA, (Tulare)	150 150 150	- 10 22	1202 1210 1202	Advanced fruit colouring	Fruit	14	0.13 0.10 (0.12)	0.03 0.02 (0.03)	0.16 0.12 (0.14)	2006/1052076 V–25654-04-H METCON_107 Max. frozen storage: 3 month
USA, 2005, Williamson, NY, (Heartland)	150 160 160	- 13 30	1171 1175 1171	Advanced fruit colouring	Fruit	14	0.04 0.05 (0.05)	0.02 0.02 (0.02)	0.06 0.07 (0.07)	2006/1052076 V–25654-05-I METCON_107
	150 150 160	- 13 30	1166 1122 1175	Advanced fruit colouring	Fruit	14	0.05 0.06 (0.06)	< 0.02 0.02 (0.02)	0.07 0.08 (0.08)	Max. frozen storage: 4 month
USA, 2005, Conklin, MI, (Montmorency)	150 150 150 (1.81 FL)	- 13 40	1181 1199 1163	75% red fruit	Fruit	14	0.02 < 0.02 (0.02)	< 0.02 < 0.02 (< 0.02)	0.04 < 0.04 (0.04)	2006/1052076 V–25654-05-J METCON_107 Max. frozen storage: 4 month
	150 150 150 (50 WDG)	- 13 40	1182 1201 1165	75% red fruit	Fruit	14	0.03 0.03 (0.03)	< 0.02 < 0.02 (< 0.02)	0.04 0.04 (0.04)	

[a] Results from 2–4 replicate field samples are presented and values in parentheses represent mean values

Berries & other small fruits

Blueberries

A total of 11 field trials were conducted with high bush blueberries in the USA and low bush blueberries in Canada during the 2006 growing season (Thompson, 2010, METCON_100). Plants received 3 foliar applications of metconazole at nominal rates of 90 g ai/ha at bloom to late bloom, 14 days and 7 days prior to harvest. Mature blueberries were collected at 6–7 days after the last application. Additional samples from decline trials were collected at 0, 1, 3 and 10/11 days. Residues of *cis*- and *trans*-metconazole were determined using method RM–41C–1with a limit of quantification

of 0.05 mg/kg. Overall mean procedural recoveries for *cis*- and *trans*-metconazole in blueberries spiked at 0.05–2.0 mg/kg were 98 ± 7% (n = 32) and 102 ± 7% (n = 32), respectively. Triazole metabolites (1,2,4-triazole, triazolyl alanine, and triazolyl acetic acid) were determined using method Meth–160 with a limit of quantification of 0.02 mg/kg. Overall mean procedural recoveries for 1,2,4-triazole, triazolyl alanine, and triazolyl acetic acid in blueberries spiked at 0.02–2 mg/kg were 118 ± 21% (n = 17), 117 ± 8% (n = 17) and 141 ± 24% (n = 19), respectively. It should be noted that recoveries for triazolyl acetic acid were >120% and for 1,2,4-triazole and triazolyl acetic acid the precision was >20%.

Residues of 1,2,4-triazole, triazolyl alanine, and triazolyl acetic acid were each below the LOQ of 0.02 mg/kg in all trials.

Table 146 Residues of *cis*- and *trans*-metconazole in blueberries following foliar treatment (cGAP Canada: 3×90 g ai/ha; 7 day PHI).

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
High bush varieties										
USA, 2006, Castle Hayne, NC, (Croatan)	89 92 90	- 37 7	380 394 386	Fruiting	Fruit	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.10 < 0.10 (< 0.10)	2010/1232553 09501.06-NC24 METCON_100 Max. frozen storage: 9 month
USA, 2006, Bridgeton, NJ, (Duke)	94 93 91	- 50 6	225 232 216	Fruiting	Fruit	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.10 < 0.10 (< 0.10)	2010/1232553 09501.06-NJ30 METCON_100 Max. frozen storage: 9 month
USA, 2006, Bridgeton, NJ, (Blueray)	94 92 94	- 49 7	226 231 224	Fruiting	Fruit	7	0.074 0.087 (0.081)	< 0.05 < 0.05 (< 0.05)	0.12 0.14 (0.13)	2010/1232553 09501.06-NJ31 METCON_100 Max. frozen storage: 9 month
USA, 2006, Fennville, MI, (Rubel)	91 90 91	- 56 14	539 583 666	Fruiting	Fruit	0 1 3 7 10	0.24 0.25 (0.25) 0.23 0.24 (0.24) 0.18 0.17 (0.18) 0.15 0.13 (0.14) 0.13 0.14 (0.14)	< 0.05 0.054 (0.054) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05)	0.29 0.30 (0.30) 0.28 0.29 (0.29) 0.23 0.22 (0.23) 0.20 0.18 (0.19) 0.18 0.19 (0.19)	2010/1232553 09501.06-MI32 METCON_100 Max. frozen storage: 9 month
USA, 2006, Aurora, OR, (Bluecrop)	91 92 93	- 49 7	567 572 582	Green fruit, some blue and red	Fruit	7	0.11 0.19 (0.15)	< 0.05 < 0.05 (< 0.05)	0.16 0.24 (0.20)	2010/1232553 09501.06-OR25 METCON_100 Max. frozen storage: 9 month
Low bush varieties										
Canada, 2006, Peters Mills, NB,	92 89 89	- 27 7	393 382 380	Fruiting	Fruit	8	0.091 0.093 (0.092)	< 0.05 < 0.05 (< 0.05)	0.14 0.14 (0.14)	2010/1232553 09501.06-NB01 METCON_100 Max. frozen

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
(Native)										storage: 9 month
Canada, 2006, Sheffield Mills, NS, (Wild clone)	99 98 100	- 55 7	439 438 447	Fruiting	Fruit	0 1 3 6 11	0.25 0.25 (0.25) 0.26 0.23 (0.25) 0.12 0.099 (0.11) 0.090 0.090 (0.090) 0.071 0.058 (0.065)	< 0.05 0.057 (0.054) 0.051 < 0.05 (0.050) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05)	0.30 0.31 (0.31) 0.31 0.28 (0.30) 0.17 0.15 (0.16) 0.14 0.14 (0.14) 0.12 0.11 (0.12)	2010/1232553 09501.06-NS01 METCON_100 Max. frozen storage: 9month
Canada, 2006, Debert, NS, (Wild clone)	99 102 96	- 56 7	439 455 429	Fruiting	Fruit	7	0.26 0.23 (0.25)	0.063 < 0.05 (0.056)	0.33 0.28 (0.31)	2010/1232553 09501.06-NS02 METCON_100 Max. frozen storage: 9 month
Canada, 2006, Earltown, NS, (Wild clone)	98 100 100	- 63 7	438 444 445	Fruiting	Fruit	8	0.12 0.092 (0.11)	< 0.05 < 0.05 (< 0.05)	0.17 0.14 (0.16)	2010/1232553 09501.06-NS03 METCON_100 Max. frozen storage: 9 month
Canada, 2006, Falardeau, QC, (Wild)	91 89 90	- 47 8	306 297 302	70–80% typical-size berries	Fruit	7	0.12 0.14 (0.13)	< 0.05 < 0.05 (< 0.05)	0.17 0.19 (0.18)	2010/1232553 09501.06-QC09 METCON_100 Max. frozen storage: 9 month
Canada, 2006, Labrecque, QC, (Wild)	92 91 86	- 47 8	308 305 296	70–80% marketable berries	Fruit	7	0.076 0.065 (0.071)	< 0.05 < 0.05 (< 0.05)	0.13 0.11 (0.12)	2010/1232553 09501.06-QC10 METCON_100 Max. frozen storage: 9 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Assorted tropical and sub-tropical fruits – inedible peel

Banana

A total of 12 field trials were conducted with banana in Costa Rica (3), Ecuador (3), Honduras (3), and Mexico (3) during the 1997 growing season (METCON_108 to METCON_119). Plants received 7 spray applications of metconazole at nominal rates of 150–151 g ai/ha. In each trial, the first application was made at flowering and the retreatment intervals were 11–15 days. Bananas were collected immediately after the last application (0 DALA). Residues of *cis*- and *trans*-metconazole were determined using method M2722 with a limit of quantification of 0.05 mg/kg. Overall mean procedural recoveries for *cis*- and *trans*-metconazole spiked at 0.05–0.1 mg/kg in banana pulp were at 86 ± 9% (n = 24) and 86 ± 9% (n = 24) and in whole fruit at 87 ± 8% (n = 24) and 86 ± 9% (n = 24), respectively.

Table 147 Residues of *cis*- and *trans*-metconazole in banana following foliar treatment (cGAP Mexico: 3×90 g ai/ha; 0 day PHI).

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
Mexico, 1997, Pichucalco, (Grand Nain)	7x150 (0.5% surfactant Citowet plus)	12–15	22–24	Mature green banana	Whole fruit	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	RES 98-050 MK–714-001 METCON_108 Max. frozen storage: 3 month
					Pulp	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	
Mexico, 1997, Teapa, (Grand Nain)	7x150 (0.5% surfactant Citowet plus)	12–15	22–24	Mature green banana	Whole fruit	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	RES 98-048 MK–714-002 METCON_109 Max. frozen storage: 3 month
					Pulp	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	
Mexico, 1997, Ejido Quintana Roo, (Grand Nain)	7x150 (0.5% surfactant Citowet plus)	12–15	22–24	Mature green banana	Whole fruit	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	RES 98-049 MK–714-003 METCON_110 Max. frozen storage: 3 month
					Pulp	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	
Ecuador, 1997, El Cuatro, (Giant)	131 164 160 174 141 132 175	14–15	17–25	Mature green banana	Whole fruit	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	RES 98-075 MK–714-004 METCON_111 Max. frozen storage: 3 month
					Pulp	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	
Honduras, 1997, Sava, (Ecuadorian Dwarf)	142 139 154 151 156 144 211	14	18–29	Mature green banana	Whole fruit	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	RES 98-096 MK–714-005 METCON_112 Max. frozen storage: 2 month
					Pulp	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	
Ecuador, 1997, El Triunfo, (Giant)	180 155 151 137 156 146 167	13–15	18–24	Mature green banana	Whole fruit	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	RES 98-074 MK–714-006 METCON_113 Max. frozen storage: 3 month
					Pulp	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	
Honduras, 1997, Sava, (Ecuadorian Dwarf)	244 136 158 156 146 148 151	14	17–34	Mature green banana	Whole fruit	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	RES 98-097 MK–714-007 METCON_114 Max. frozen storage: 2 month
					Pulp	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	
Honduras, 1997, Isleta Central,	201 143 161	14	18–28	Mature green banana	Whole fruit	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	RES 98-095 MK–714-008 METCON_11

Location, Year (variety)	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Residues (mg/kg) [a] Sample	DALA	Metconazole *cis*-	*trans*-	Total	Report/Trial No., Reference, Storage period
(Valery)	146 149 151 149				Pulp	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	5 Max. frozen storage: 2 month
Ecuador, 1997, Milagro, (Valery)	134 144 141 164 182 143 177	13–15	18–25	Mature green banana	Whole fruit	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (≤ 0.10)	RES 98-076 MK–714-009 METCON_116 Max. frozen storage: 3 month
					Pulp	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	
Costa Rica, 1997, Rio Jimenez, (Enano Gigante)	7x150	11–14	19–23	Mature green banana	Whole fruit	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (≤ 0.10)	RES 98-085 MK–714-010 METCON_117 Max. frozen storage: 3 month
					Pulp	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	
Costa Rica, 1997, Bataan, (Grand Nain)	7x150	11–14	19–23	Mature green banana	Whole fruit	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (≤ 0.10)	RES 98-086 MK–714-011 METCON_118 Max. frozen storage: 4 month
					Pulp	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	
Costa Rica, 1997, Limon, (Valerie)	7x150	11–14	19–23	Mature green banana	Whole fruit	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (≤ 0.10)	RES 98-087 MK–714-012 METCON_119 Max. frozen storage: 4 month
					Pulp	0	4×< 0.05 (< 0.05)	4×< 0.05 (< 0.05)	4×< 0.10 (< 0.10)	

[a] Results from 4 replicate field samples are presented and values in parentheses represent mean values

Bulb vegetables

Bulb onion

A total of four field trials were conducted with onion in Brazil in the 1998–2003 growing seasons (METCON_120 to METCON_127). Plants received 3 spray applications of metconazole at nominal rates of either 90 g ai/ha or 180 g ai/ha with a 7 day interval between applications, except one trial having a 30 day interval between the first and second treatment. Onion bulbs were collected at 14 days after the last application. In decline trials onion bulbs were also collected at 1, 3 and 7 DALA or at 0, 7, 14, 21 and 21 DALA. Residues of metconazole were either determined using method MK–240-001 (equivalent to method FAMS 050 01) with a limit of quantification of 0.02 mg/kg, or method SOP-PA.0206 with a limit of quantification of 0.01 mg/kg or 0.05 mg/kg. Procedural recoveries for all trials were within 70–120% with an RSD of < 20%.

Table 148 Residues of metconazole in onion following foliar treatment (cGAP Brazil: 3×90 g ai/ha; 14 day PHI).

Location, Year (variety)	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Residues (mg/kg) Sample	DALA	Metconazole	Report/Trial No., Reference, Storage period

Location, Year (variety)	Application				Residues (mg/kg)			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole	
Brazil, 1998, Engenheiro Coelho-SP, (Baia Periforme)	3×90	7	500	Development of bulbs	Bulbs	14	<u>≤ 0.02</u>	RES-CARAMBA–20 1998/3000726 METCON_120 1998/1010995 METCON_121 Max. frozen storage: not stated
	3×180	7	500	Development of bulbs	Bulbs	14	< 0.02	
Brazil, 1999, Ibiúna, SP, (Hybrid Baia Dura)	3×90	7	800	Bulb growth	Bulbs	14	<u>≤ 0.05</u>	RES-CARAMBA–22 2000/3000660 METCON_122 2000/1024653 METCON_123 Max. frozen storage: 5 month
	3×180	7	800	Bulb growth	Bulbs	14	0.14	
Brazil, 1999, Engenheiro Coelho, SP, (Piriform Bay)	3×90	7	800	Bulb growth	Bulbs	1 3 7	< 0.05 < 0.05 <u>≤ 0.05</u>	RES-CARAMBA–21 2000/3000737 METCON_124 2000/1024654 METCON_125 Max. frozen storage: 4 month
Brazil, 2003, Ponta Grossa, PR, (Crioula Mercosul)	90 90 90	- 30 7	Not stated	Mature	Bulbs	0 7 14 21 28	< 0.01 < 0.01 < 0.01 < 0.01 < 0.01	RES-CARAMBA–90 2006/3000666 METCON_126 2006/1053713 METCON_127 Max. frozen storage: 23 month (stability not demonstrated)
	180 180 180	- 30 7	Not stated	Mature	Bulbs	14	0.04	

Garlic

A total of 4 field trials were conducted with garlic in Brazil in the 1998–2003 growing seasons (METCON_128 to METCON_135). Plants received 3 spray applications of metconazole at nominal rates of either 90 g ai/ha or 180 g ai/ha with a 7 day interval between applications. Garlic bulbs were collected at 14 days after the last application. In decline trials, garlic bulbs were also collected at 1, 3, 7, 14 and 21 DALA. Residues of metconazole were either determined using method MK–240-001 (equivalent to method FAMS 050 01) with a limit of quantification of 0.02 mg/kg, or method SOP-PA.0206 with a limit of quantification of 0.01 mg/kg or 0.05 mg/kg. Procedural recoveries for all trials were within 70–120% with an RSD of <20%.

Table 149 Residues of metconazole in garlic following foliar treatment (cGAP Brazil: 3×90 g ai/ha; 14 day PHI).

Location, Year (variety)	Application				Residues (mg/kg)			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole	
Brazil, 1998, Engenheiro Coelho-SP, (Gigante)	3×90	7	500	Development of heads (bulbs)	Bulbs	14	<u>≤ 0.02</u>	RES-CARAMBA–13 1999/3000525 METCON_128 1999/1015377 METCON_129 Max. frozen storage:
	3×180	7	500	Development of heads (bulbs)	Bulbs	14	< 0.02	

Location, Year (variety)	Application				Residues (mg/kg)			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole	3 month
Brazil, 1999, Piedade, SP, (Chonam)	3×90	7	800	Mature	Bulbs	1 3 7 14 21	< 0.05 < 0.05 < 0.05 < 0.05 < 0.05	RES-CARAMBA–12 2000/3000672 METCON_130 2000/1024649 METCON_131 Max. frozen Max. frozen storage: 9 month
Brazil, 1999, Pilar do Sul, SP, (Hunter)	3×90	7	800	Bulb growth	Bulbs	14	< 0.05	BR 301 00 163 J2 2000/3000683 METCON_132 2000/1024650 METCON_133 Max. frozen Max. frozen storage: 8 month
	3×180	7	800	Bulb growth	Bulbs	14	0.11	
Brazil, 2003, Ponta Grossa, PR, (Roxo Pérola)	3×90	7	Not stated	Mature	Bulbs	14	< 0.01	RES-CARAMBA–90 2005/3000331 METCON_134 2005/1046040 METCON_135 Max. frozen Max. frozen storage: 21 month (stability not demonstrated)
	3×180	7	Not stated	Mature	Bulbs	14	< 0.01	

Legume vegetables

Green bean

A total of five field trials were conducted with green bean in Brazil in the 1998 and 2003 growing seasons (METCON_136 to METCON_138). Plants received 3 spray applications of metconazole at nominal rates of either 45 g ai/ha, 90 g ai/ha or 180 g ai/ha with a 7 day interval between applications. Green beans were collected at 14–15 days after the last application. In one decline trial, green beans were also collected at 0, 7, 15, 21 and 28 DALA. Residues of metconazole were either determined using method MK–240-001 (equivalent to method FAMS 050 01) with a limit of quantification of 0.02 mg/kg, or method POP PA 0223 with a limit of quantification of 0.05 mg/kg. Overall mean procedural recoveries for metconazole spiked at 0.05–0.5 mg/kg in green beans were at 92 ± 3% (n = 6).

Table 150 Residues of metconazole in green beans following foliar treatment (cGAP Brazil: 3×14 g ai/ha; 15 day PHI).

Location, Year (variety)	Application				Residues (mg/kg)			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole	
Brazil, 1998, Engenheiro Coelho-SP, (Macarrão Favorito AG–480)	3×90	7	400	Formation of green beans (pods) and inflorescence	Pods with seeds	14	< 0.02	RES-CARAMBA–17 1999/3000524 METCON_136 2018/3003649 METCON_137 Max. frozen storage: 3 month
	3×180	7	400	Formation of green beans (pods) and inflorescence	Pods with seeds	14	< 0.02	

Location, Year (variety)	Application				Residues (mg/kg)			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole	
Brazil, 2003, Ponta Grossa, PR, (Macarrão Trepador)[a]	3×45	7	500	81	Pods with seeds	0 7 15 21 28	0.15 < 0.05 < 0.05 < 0.05 < 0.05	RES-CARAMBA–90 CD/F/2003/045/BRT 2004/3000236 METCON_138 Max. frozen storage: 6 month
Brazil, 2003, Ponta Grossa, PR, (Macarrão Trepador) [a]	3×45	7	500	81	Pods with seeds	15	< 0.05	RES-CARAMBA–90 CD/F/2003/044/BRT 2004/3000236 METCON_138 Max. frozen storage: 6 month
	3×90	7	500	81	Pods with seeds	15	< 0.05	
Brazil, 2003, Monte Mor, SP, (Carioca)	3×45	7	500	75	Pods with seeds	15	< 0.05	RES-CARAMBA–90 R/F/2003/047/BRU 2004/3000236 METCON_138 Max. frozen storage: 6 month
	3×90	7	500	75	Pods with seeds	15	< 0.05	
Brazil, 2003, Uberlandia, MG, (Braganca)	3×45	7	1000	75	Pods with seeds	15	< 0.05	RES-CARAMBA–90 R/F/2003/048/BRV 2004/3000236 METCON_138 Max. frozen storage: 6 month
	3×90	7	1000	75	Pods with seeds	15	< 0.05	

[1] It was noted that trial CD/F/2003/044/BRT and CD/F/2003/045/BRT were performed at the same location and year and therefore could not be considered as independent.

Pulses

Dry beans

A total of six field trials were conducted on dry beans in Canada in the 2007–2008 growing seasons (Green, 2010, METCON_139). Plants received 2 foliar applications of metconazole at nominal rates of 138–141 g ai/ha with 0.125% non-ionic surfactant. Beans were harvested at 20–22 days after the last application. Additional samples from a decline trial were collected at 8, 14, 21 and 26 days. Due to the variability in the moisture level of the samples, the analytical results were adjusted for 19% moisture content. Residues of *cis*- and *trans*-metconazole were determined using method RM–41C–2–1 with a limit of quantification of 0.02 mg/kg. Overall mean procedural recoveries for *cis*- and *trans*-metconazole in dry beans spiked at 0.02 and 0.1 mg/kg were 106 ± 10% (n = 6) and 107 ± 9% (n = 6), respectively.

Table 151 Residues of *cis*- and *trans*-metconazole in dry beans following foliar treatment (cGAP USA, Canada: 2×140 g ai/ha; 21 days PHI) in Canada.

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
Canada, 2007, Portage La Prairie, Manitoba, (Pintoba) [b]	140 140	- 9	349 349	BBCH 78–86	Bean seed	8 14 21	< 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 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 (< 0.04) < 0.04 < 0.04	V–31583 2010/1232554 V–31583-07-A METCON_139 Max. frozen storage: 9 month

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
						26	(< 0.02) < 0.02 < 0.02 (< 0.02)	(< 0.02) < 0.02 < 0.02 (< 0.02)	(< 0.04) < 0.04 < 0.04 (< 0.04)	
Canada, 2007, Oakville, Manitoba, (Pintoba)	139 139	- 7	348 347	BBCH 79–81	Bean seed	22	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	V–31583 2010/1232554 V–31583-07-B METCON_139 Max. frozen storage: 9 month
Canada, 2007, Portage La Prairie, Manitoba, (Pintoba)[b]	140 140	- 7	349 350	BBCH 79–81	Bean seed	22	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	V–31583 2010/1232554 V–31583-07-C METCON_139 Max. frozen storage: 9 month
Canada, 2007, Elm Creek, Manitoba, (Pintoba)	140 139	- 7	350 348	BBCH 79–81	Bean seed	22	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	V–31583 2010/1232554 V–31583-07-D METCON_139 Max. frozen storage: 9 month
Canada, 2007, Taber, Alberta, (Great Northern White)	138 141	- 7	369 378	BBCH 81	Bean seed	21	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	V–31583 2010/1232554 V–31583-07-E METCON_139 Max. frozen storage: 9 month
Canada, 2008, Vanscoy, Saskatchewan, (White Mountain Pinto)	140 140	- 7	401 401	BBCH 79–82	Bean seed	20	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	V–31583 2010/1232554 V–31583-07-F METCON_139 Max. frozen storage: 2 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] It was noted that trial V–31583-07-A and V–31583-07-C were performed at the same location and year and therefore could not be considered as independent.

Additionally, a total of 13 field trials were conducted on dry beans in the USA in the 2010 growing season (Corley, 2013, METCON_140). Plants received 2 foliar applications of metconazole at nominal rates of 133–149 g ai/ha. Beans were harvested at 19–23 days after the last application. Residues of *cis*- and *trans*-metconazole were determined using method RM–41C–1with a limit of quantification of 0.02 mg/kg. Overall mean procedural recoveries for *cis*- and *trans*-metconazole in dry beans spiked at 0.02 and 0.2 mg/kg were 84 ± 13% (n = 18) and 86 ± 16% (n = 18), respectively. Triazole metabolite triazolyl alanine was determined using method Meth–160 with a limit of quantification of 0.02 mg/kg. Overall mean procedural recoveries for triazolyl alanine in dry bean spiked at 0.02–0.5 mg/kg were 83 ± 16% (n = 17).

Table 152 Residues of *cis*- and *trans*-metconazole in dry beans following foliar treatment (cGAP USA, Canada: 2×140 g ai/ha; 21 days PHI) in the USA.

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
USA, 2010, Parlier, CA, (Ford Hook 242)	145 141	- 7	385 374	Fruiting/ blooming	Bean seed	19	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	10388 2013/1418322 10388.10-CA118 METCON_140 Max. frozen storage: 5 month
USA, 2010, Kimberley, ID, (Othello pinto)	139 137	- 7	187 177	Pod fill	Bean seed	22	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	10388 2013/1418322 10388.10-ID13 METCON_140 Max. frozen storage: 7 month
USA, 2010, Larned, KS, (Chase pinto)	137 138	- 8	187 187	Pods	Bean seed	20	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	10388 2013/1418322 10388.10-KS02 METCON_140 Max. frozen storage: 6 month
USA, 2010, Holt, MI, (Mayflower navy)	140 144	- 6	187 196	Fruiting	Bean seed	21	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	10388 2013/1418322 10388.10-MI37 METCON_140 Max. frozen storage: 8 month
USA, 2010, Velva, ND, (Lariat pinto)	141 140	- 7	140 140	Pod filling	Bean seed	20	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	10388 2013/1418322 10388.10-ND16 METCON_140 Max. frozen storage: 8 month
USA, 2010, Grand Island, NE, (Marquis northern)	140 140	- 7	187 178	Ripening	Bean seed	23	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	10388 2013/1418322 10388.10-NE01 METCON_140 Max. frozen storage: 8 month
USA, 2010, Las Cruces, NM (UI–196 pinto)	141 140	- 6	150 168	Fruiting	Bean seed	20	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	10388 2013/1418322 10388.10-NM10 METCON_140 Max. frozen storage: 9 month
USA, 2010, Freeville, NY, (Hystyle)	140 140	- 7	421 421	Fruiting	Bean seed	21	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	10388 2013/1418322 10388.10-NY26 METCON_140 Max. frozen storage: 8 month
USA, 2010, Fremont, OH, (French Horticultural)	149 136	- 6	262 234	Fruiting	Bean seed	21	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	10388 2013/1418322 10388.10-OH*15 METCON_140 Max. frozen storage: 7 month
USA, 2010, Fremont, OH, (Great northern)	133 141	- 6	430 439	Fruiting	Bean seed	21	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	10388 2013/1418322 10388.10-OH*16 METCON_140

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
										Max. frozen storage: 7 month
USA, 2010, Moxee, WA, (Othelo)	140 144	- 6	168 168	Boom/ podded	Bean seed	21	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	10388 2013/1418322 10388.10-WA*33 METCON_140 Max. frozen storage: 8 month
USA, 2010, Arlington, WI, (California early kidney)	145 144	- 8	178 178	Pods/beans	Bean seed	20	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	10388 2013/1418322 10388.10-WI115 METCON_140 Max. frozen storage: 8 month
USA, 2010, Arlington, WI, (Montcalm dard red kidney)	146 145	- 6	468 477	Pods/beans	Bean seed	19	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	10388 2013/1418322 10388.10-WI116 METCON_140 Max. frozen storage: 8 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 153 Residues of triazolyl alanine in dry beans following foliar treatment (cGAP USA, Canada: 2×140 g ai/ha; 21 days PHI) in the USA.

Location, Year (variety)	Application				Residues (mg/kg) [a]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Triazolyl alanine	
USA, 2010, Parlier, CA, (Ford Hook 242)	145 141	- 7	385 374	Fruiting/ blooming	Bean seed	19	< 0.02 < 0.02 (< 0.02)	10388 2013/1418322 10388.10-CA118 METCON_140 Max. frozen storage: 3 month
USA, 2010, Kimberley, ID, (Othello pinto)	139 137	- 7	187 177	Pod fill	Bean seed	22	< 0.02 < 0.02 (< 0.02)	10388 2013/1418322 10388.10-ID13 METCON_140 Max. frozen storage: 5 month
USA, 2010, Larned, KS, (Chase pinto)	137 138	- 8	187 187	Pods	Bean seed	20	0.023 0.021 (0.022)	10388 2013/1418322 10388.10-KS02 METCON_140 Max. frozen storage: 4 month
USA, 2010, Holt, MI, (Mayflower navy)	140 144	- 6	187 196	Fruiting	Bean seed	21	0.35 0.35 (0.35) Control: 0.25	10388 2013/1418322 10388.10-MI37 METCON_140 Max. frozen storage: 6 month
USA, 2010, Velva, ND, (Lariat pinto)	141 140	- 7	140 140	Pod filling	Bean seed	20	0.024 0.031 (0.028) Control: 0.022	10388 2013/1418322 10388.10-ND16 METCON_140 Max. frozen storage: 5 month

Location, Year (variety)	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Residues (mg/kg) [a] Sample	DALA	Triazolyl alanine	Report/Trial No., Reference, Storage period
USA, 2010, Grand Island, NE, (Marquis northern)	140 140	- 7	187 178	Ripening	Bean seed	23	0.022 0.020 (0.021)	10388 2013/1418322 10388.10-NE01 METCON_140 Max. frozen storage: 6 month
USA, 2010, Las Cruces, NM (UI–196 pinto)	141 140	- 6	150 168	Fruiting	Bean seed	20	0.023 0.024 (0.024)	10388 2013/1418322 10388.10-NM10 METCON_140 Max. frozen storage: 7 month
USA, 2010, Freeville, NY, (Hystyle)	140 140	- 7	421 421	Fruiting	Bean seed	21	< 0.02 < 0.02 (< 0.02)	10388 2013/1418322 10388.10-NY26 METCON_140 Max. frozen storage: 5 month
USA, 2010, Fremont, OH, (French Horticultural)	149 136	- 6	262 234	Fruiting	Bean seed	21	< 0.02 < 0.02 (< 0.02)	10388 2013/1418322 10388.10-OH*15 METCON_140 Max. frozen storage: 5month
USA, 2010, Fremont, OH, (Great northern)	133 141	- 6	430 439	Fruiting	Bean seed	21	< 0.02 < 0.02 (< 0.02)	10388 2013/1418322 10388.10-OH*16 METCON_140 Max. frozen storage: 5 month
USA, 2010, Moxee, WA, (Othelo)	140 144	- 6	168 168	Boom/ podded	Bean seed	21	< 0.02 < 0.02 (< 0.02)	10388 2013/1418322 10388.10-WA*33 METCON_140 Max. frozen storage: 6 month
USA, 2010, Arlington, WI, (California early kidney)	145 144	- 8	178 178	Pods/beans	Bean seed	20	0.023 0.026 (0.025)	10388 2013/1418322 10388.10-WI115 METCON_140 Max. frozen storage: 6 month
USA, 2010, Arlington, WI, (Montcalm dard red kidney)	146 145	- 6	468 477	Pods/beans	Bean seed	19	0.038 0.036 (0.037) Control: 0.027	10388 2013/1418322 10388.10-WI116 METCON_140 Max. frozen storage: 5 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Dry peas

A total of nine field trials were conducted on dry peas in Canada in the 2007–2008 growing seasons (Green, 2010, METCON_141). Plants received 2 foliar applications of metconazole at nominal rates of 136–142 g ai/ha with 0.125% non-ionic surfactant. Peas were harvested at 21 days after the last application. Additional samples from a decline trial were collected at 6, 13, 20 and 26 days. Due to the variability in the moisture level of the samples, the analytical results were adjusted for 18% moisture content. Residues of *cis*- and *trans*-metconazole were determined using method RM–41C–2–1 with a limit of quantification of 0.02 mg/kg. Overall mean procedural recoveries for *cis*- and *trans*-

metconazole in dry beans spiked at 0.02 and 0.2 mg/kg were 96 ± 13% (n = 10) and 94 ± 8% (n = 10), respectively.

Table 154 Residues of *cis*- and *trans*-metconazole in dry peas following foliar treatment (cGAP USA, Canada: 2×140 g ai/ha; 21 days PHI) in Canada.

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
Canada, 2007, Portage La Prairie, Manitoba, (DS Admiral)	138 140	- 6	349 350	BBCH 87–89	Pea seed	6 13 20 27	< 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 0.022 (0.021)	< 0.02 < 0.02 (< 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 (< 0.04) < 0.04 < 0.04 (< 0.04) < 0.04 < 0.04 (0.041)	V–31579 201000149 V–31579-07-A METCON_141 Max. frozen storage: 9 month
Canada, 2007, Oakville, Manitoba, (DS Admiral)	141 141	- 10	353 351	BBCH 79	Pea seed	21	0.022 0.021 (0.022)	< 0.02 < 0.02 (< 0.02)	0.042 0.041 (0.042)	V–31579 201000149 V–31579-07-B METCON_141 Max. frozen storage: 9 month
Canada, 2007, Wakaw, Saskatchewan, (DS Admiral)	141 141	- 7	378 378	BBCH 77	Pea seed	21	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	V–31579 201000149 V–31579-07-C METCON_141 Max. frozen storage: 10 month
Canada, 2007, Alvena, Saskatchewan, (DS Admiral)	140 141	- 7	376 377	BBCH 77	Pea seed	21	0.046 0.035 (0.041)	< 0.02 < 0.02 (< 0.02)	0.066 0.055 (0.061)	V–31579 201000149 V–31579-07-D METCON_141 Max. frozen storage: 9 month
Canada, 2007, Waldheim, Saskatchewan (Cutlass)	141 140	- 7	378 374	BBCH 79	Pea seed	21	0.027 0.035 (0.031)	< 0.02 < 0.02 (< 0.02)	0.047 0.055 (0.051)	V–31579 201000149 V–31579-07-E METCON_141 Max. frozen storage: 9 month
Canada, 2007, Fort Saskatchewan, Alberta (Cooper)	139 141	- 7	374 377	BBCH 83–84	Pea seed	21	0.045 0.061 (0.053)	< 0.02 < 0.02 (< 0.02)	0.065 0.081 (0.073)	V–31579 201000149 V–31579-07-F METCON_141 Max. frozen storage: 9 month
Canada, 2007, Josephburg, Alberta (Cooper)	141 142	- 7	376 380	BBCH 81	Pea seed	22	0.027 0.028 (0.028)	< 0.02 < 0.02 (< 0.02)	0.047 0.048 (0.048)	V–31579 201000149 V–31579-07-G METCON_141 Max. frozen storage: 9 month

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
Canada, 2007, Mundare, Alberta (Cooper)	136 138	- 7	364 368	BBCH 82	Pea seed	20	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (<u>< 0.04</u>)	V–31579 201000149 V–31579-07-H METCON_141 Max. frozen storage: 9 month
Canada, 2008, Elm Creek, Manitoba, (Tudor)	183 137	- 7	342 342	BBCH 79	Pea seed	21	0.072 0.050 (0.061)	0.023 < 0.02 (0.022)	0.096 0.072 (<u>0.084</u>)	V–31579 201000149 V–31579-07-I METCON_141 Max. frozen storage: 2 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Additionally, a total of six field trials were conducted on dry peas in the USA in the 2010 growing season (Corley, 2013, METCON_142). Plants received 2 foliar applications of metconazole at nominal rates of 139–147 g ai/ha. Peas were harvested at 20–22 days after the last application. Additional samples from a decline trial were collected at 9, 14, 21 and 28 days. Residues of *cis*- and *trans*-metconazole were determined using method RM–41C–1with a limit of quantification of 0.02 mg/kg. Overall mean procedural recoveries for *cis*- and *trans*-metconazole in dry beans spiked at 0.02 and 0.2 mg/kg were 99 ± 13% (n = 15) and 98 ± 16% (n = 15), respectively. Triazole metabolite triazolyl alanine was determined using method Meth–160 with a limit of quantification of 0.02 mg/kg. Overall mean procedural recoveries for triazolyl alanine in dry bean spiked at 0.02–10 mg/kg were 88 ± 9% (n = 18).

Table 155 Residues of *cis*- and *trans*-metconazole in dry peas following foliar treatment (cGAP USA, Canada: 2×140 g ai/ha; 21 days PHI) in the USA.

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
USA, 2010, Maricopa, AZ, (Knight)	147 142	- 7	290 281	Fruiting	Pea seed	21	0.042 0.030 (0.036)	< 0.02 < 0.02 (< 0.02)	0.062 0.050 (<u>0.056</u>)	10389 2013/1418321 10389.10-AZ*12 METCON_142 Max. frozen storage: 13 month
USA, 2010, Kimberley, ID, (Joel)	139 142	- 7	140 140	Maturing	Pea seed	9 14 21 28	< 0.02 < 0.02 (< 0.02) 0.035 0.035 (0.035) < 0.02 < 0.02 (< 0.02) 0.026 < 0.02 (0.023)	< 0.02 < 0.02 (< 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) 0.055 0.055 (0.055) < 0.04 < 0.04 (< 0.04) 0.046 < 0.04 (<u>0.043</u>)	10389 2013/1418321 10389.10-ID14 METCON_142 Max. frozen storage: 11 month
USA, 2010, Velva, ND, (Golden) [b]	142 140	- 8	140 140	Blooming	Pea seed	22	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (<u>< 0.04</u>)	10389 2013/1418321 10389.10-ND17

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
										METCON_142 Max. frozen storage: 13 month
USA, 2010, Velva, ND, (Golden) [b]	141 141	- 8	140 140	Blooming	Pea seed	22	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	10389 2013/1418321 10389.10-ND18 METCON_142 Max. frozen storage: 13 month
USA, 2010, Grand Island, NE, (Austrian Winter)	140 141	- 7	187 187	Ripening	Pea seed	22	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	10389 2013/1418321 10389.10-NE02 METCON_142 Max. frozen storage: 11 month
USA, 2010, Moxee, WA, (Columbian)	141 139	- 7	206 206	Bloom/seed	Pea seed	20	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	10389 2013/1418321 10389.10-WA*34 METCON_142 Max. frozen storage: 11 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] It was noted that trial ND17 and ND18 were performed at the same location and year and therefore could not be considered as independent.

Table 156 Residues of triazolyl alanine in dry peas following foliar treatment (cGAP USA, Canada: 2×140 g ai/ha; 21 days PHI) in the USA.

Location, Year (variety)	Application				Residues (mg/kg) [a]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Triazolyl alanine	
USA, 2010, Maricopa, AZ, (Knight)	147 142	- 7	290 281	Fruiting	Pea seed	21	0.064 0.076 (0.070) Control: 0.037	10389 2013/1418321 10389.10-AZ*12 METCON_142 Max. frozen storage: 14 month
USA, 2010, Kimberley, ID, (Joel)	139 142	- 7	140 140	Maturing	Pea seed	9 14 21 28	0.17 0.18 (0.17) 0.18 0.23 (0.20) 0.16 0.22 (0.19) Control: 0.026 0.17 0.18 (0.17)	10389 2013/1418321 10389.10-ID14 METCON_142 Max. frozen storage: 13 month
USA, 2010, Velva, ND, (Golden)	142 140	- 8	140 140	Blooming	Pea seed	22	1.8 1.5 (1.6)	10389 2013/1418321 10389.10-ND17

Location, Year (variety)	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Residues (mg/kg) [a] Sample	DALA	Triazolyl alanine	Report/Trial No., Reference, Storage period
							Control. 0.044, 0.041	METCON_142 Max. frozen storage: 13 month
USA, 2010, Velva, ND, (Golden)	141 141	- 8	140 140	Blooming	Pea seed	22	3.2 3.1 (3.1) Control: 1.4, 1.2	10389 2013/1418321 10389.10-ND18 METCON_142 Max. frozen storage: 13 month
USA, 2010, Grand Island, NE, (Austrian Winter)	140 141	- 7	187 187	Ripening	Pea seed	22	0.60 0.58 (0.59) Control: 0.19	10389 2013/1418321 10389.10-NE02 METCON_142 Max. frozen storage: 13 month
USA, 2010, Moxee, WA, (Columbian)	141 139	- 7	206 206	Bloom/seed	Pea seed	20	0.45 0.46 (0.46) Control: 0.16	10389 2013/1418321 10389.10-WA*34 METCON_142 Max. frozen storage: 11 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Soya bean

A total of six field trials were conducted on soya beans in the USA during the 2004 growing season (Leonard, 2005, METCON_143). Plants received 2 foliar applications of metconazole at nominal rates of 80 g ai/ha with 0.25% adjuvant. Soya bean seeds were harvested 30 or 31 days after the last application. Residues of *cis*- and *trans*-metconazole were determined using method 550/0 with a limit of quantification of 0.005 mg/kg per isomer. Method validation and procedural recoveries for all trials were within 70–120% with an RSD of <20%.

Table 157 Residues of *cis*- and *trans*-metconazole in soya bean seeds following foliar treatment (cGAP Brazil: 3×54 g ai/ha; 14 day PHI) in the USA.

Location, Year (variety)	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Residues (mg/kg) [a] Sample	DALA	Metconazole *cis*-	*trans*-	Total	Report/Trial No., Reference, Storage period
USA, 2004, Chula, GA, (Dekalb H7242RR)	80 80	- 10	207 206	BBCH 79	Soya bean seed	30	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.010 < 0.010 (<u>≤ 0.010</u>)	204640 2004/5000755 RCN 2004192 METCON_143 Max. frozen storage: 1 month
USA, 2004, Newport, AR, (Genesis C444NRR)	80 80	- 10	189 188	BBCH 79	Soya bean seed	30	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.010 < 0.010 (<u>≤ 0.010</u>)	204640 2004/5000755 RCN 2004193 METCON_143 Max. frozen storage: 2 month
USA, 2004, Proctor, AR, (DP5634RR)	80 80	- 10	189 190	BBCH 79	Soya bean seed	30	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.010 < 0.010 (<u>≤ 0.010</u>)	204640 2004/5000755 RCN 2004194 METCON_143 Max. frozen storage: 1 month
USA, 2004,	80	-	188	BBCH 79	Soya	30	< 0.005	< 0.005	< 0.010	204640

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
Stoneville, MS, (Pioneer 95B96)	80	10	189		bean seed		< 0.005 (< 0.005)	< 0.005 (< 0.005)	< 0.010 (<u>≤ 0.010</u>)	2004/5000755 RCN 2004195 METCON_143 Max. frozen storage: 2 month
USA, 2004, Arkansaw, WI, (NK S20-G4)	80 80	- 10	188 189	BBCH 79	Soya bean seed	30	0.035 0.036 (0.036)	0.009 0.011 (0.010)	0.044 0.047 (<u>0.046</u>)	204640 2004/5000755 RCN 2004196 METCON_143 Max. frozen storage: 3 month
USA, 2004, Carlyle, IL, (BT–383CR)	80 80	- 10	100 95	BBCH 79	Soya bean seed	31	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.010 < 0.010 (<u>≤ 0.010</u>)	204640 2004/5000755 RCN 2004197 METCON_143 Max. frozen storage: 1 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

A total of 15 field trials were conducted on soya bean in Canada and the USA during the 2005 growing season (White & Saha, 2006, METCON_144). Plants received 2 foliar applications of metconazole at nominal rates of 80 g ai/ha. Soya beans were harvested at 28–32 days after the last application. Additional samples from decline trials were collected at 23, 29–30, 36–37, and 43 44 days. Residues of *cis*- and *trans*-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0508. The limit of quantification for the sum of *cis*- and *trans*-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of <20%.

Residues of metabolites M11, M21 and M30 were each below the LOQ of 0.01 mg/kg in all trials.

Table 158 Residues of *cis*- and *trans*-metconazole in soya bean seeds following foliar treatment (cGAP Brazil: 3×54 g ai/ha; 14 day PHI) in Canada and the USA.

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
USA, 2005, Chula, GA, (Dekalb H7242RR)	80 80	- 10	176 180	BBCH 79	Soya bean seed	30	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.010 < 0.010 (<u>≤ 0.010</u>)	137726 2006/7006995 R05111 METCON_144 Max. frozen storage: 4.4 month
USA, 2005, Theilman, MN, (Asgrow AG1603)	80 80	- 10	189 187	BBCH 77	Soya bean seed	30	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.010 < 0.010 (<u>≤ 0.010</u>)	137726 2006/7006995 R05112 METCON_144 Max. frozen storage: 5.2 month
USA, 2005, Dumfries, MN,	80 80	- 10	188 185	BBCH 77	Soya bean seed	30	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.010 < 0.010 (<u>≤ 0.010</u>)	137726 2006/7006995 R05113

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
(Asgrow AG1603)										METCON_144 Max. frozen storage: 5.2 month
USA, 2004, Grandfork, IL, (DKB38–52)	80 80	- 10	149 151	BBCH 79	Soya bean seed	30	0.007 0.005 (0.006)	< 0.005 < 0.005 (< 0.005)	0.012 0.010 (0.011)	137726 2006/7006995 R05114 METCON_144 Max. frozen storage: 4.8 month
USA, 2005, Carlyle, IL, (NK 43-B1)	80 80	- 11	175 184	BBCH 79	Soya bean seed	30	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.010 < 0.010 (< 0.010)	137726 2006/7006995 R05115 METCON_144 Max. frozen storage: 3.9 month
USA, 2005, Wyoming, IL, (Asgrow 3202)	80 80	- 11	176 175	BBCH 89	Soya bean seed	31	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.010 < 0.010 (< 0.010)	137726 2006/7006995 R05116 METCON_144 Max. frozen storage: 4.7 month
USA, 2005, Osceola, NB, (Pioneer 92M80)	80 80	- 10	184 189	BBCH 77	Soya bean seed	30	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.010 < 0.010 (< 0.010)	137726 2006/7006995 R05117 METCON_144 Max. frozen storage: 4.8 month
USA, 2005, York, NB, (Pioneer 92M80)	80 80	- 9	187 187	BBCH 77	Soya bean seed	23 30 36 43	< 0.005 0.006 (0.01) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) 0.005 < 0.005 (0.005)	< 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005)	< 0.010 0.011 (0.01) < 0.010 < 0.010 (< 0.010) < 0.010 < 0.010 (< 0.010) 0.010 < 0.010 (0.010)	137726 2006/7006995 R05118 METCON_144 Max. frozen storage: 5.0 month
USA, 2005, Grand Island, NB, (Dyna-Gro 37B28RR)	80 80	- 10	184 187	BBCH 77	Soya bean seed	30	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.010 < 0.010 (< 0.010)	137726 2006/7006995 R05119 METCON_144 Max. frozen storage: 4.6 month
Canada, 2005, Branchton, ON (Mycogen 5140RR)	80 80	- 9	262 299	BBCH 77	Soya bean seed	32	0.023 0.025 (0.024)	0.006 0.006 (0.006)	0.029 0.031 (0.030)	137726 2006/7006995 R05120 METCON_144 Max. frozen storage: 4.7 month
USA, 2005, Wapello,	80 80	- 10	135 137	BBCH 75	Soya bean	31	0.006 0.007	< 0.005 < 0.005	0.011 0.012	137726 2006/7006995

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
IA, (Pioneer 93M11)					seed		(0.007)	(< 0.005)	(0.012)	R05121 METCON_144 Max. frozen storage: 4.0 month
USA, 2005, Jefferson, IA, (Pioneer 93B87)	80 80	- 9	138 131	BBCH 75	Soya bean seed	23 30 37 44	< 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005)	< 0.010 < 0.010 (< 0.010) < 0.010 < 0.010 (< 0.010) < 0.010 < 0.010 (< 0.010) < 0.010 < 0.010 (< 0.010)	137726 2006/7006995 R05122 METCON_144 Max. frozen storage: 5.3 month
USA, 2005, Keokuk, IA, (DeKalb 3451)	80 80	- 10	138 142	BBCH 75	Soya bean seed	30	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.010 < 0.010 (< 0.010)	137726 2006/7006995 R05123 METCON_144 Max. frozen storage: 4.1 month
USA, 2005, Conklin, MI, (Asgrow: AG1903)	80 80	- 10	192 191	BBCH 81	Soya bean seed	28	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.010 < 0.010 (< 0.010)	137726 2006/7006995 R05124 METCON_144 Max. frozen storage: 4.0 month
Canada, 2005, St-Pie-de-Bagot, QC, (26-02RRR)	80 80	- 11	228 215	BBCH 79	Soya bean seed	30	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.010 < 0.010 (< 0.010)	137726 2006/7006995 R05125 METCON_144 Max. frozen storage: 4.2 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 159 Residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), and triazolyl acetic acid (TAA) in soya bean seeds following foliar treatment (cGAP Brazil: 3×54 g ai/ha; 14 day PHI) in the Canada and the USA.

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolite			
							T	TA	TAA	
USA, 2005, Chula, GA, (Dekalb H7242RR)	80 80	- 10	176 180	BBCH 79	Soya bean seed	30	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05) Control: 0.91	0.69 0.64 (0.67)	137726 2006/7006995 R05111 METCON_144 Max. frozen storage: 4.4 month
USA, 2005, Theilman,	80 80	- 10	189 187	BBCH 77	Soya bean	30	< 0.05 < 0.05	< 0.05 < 0.05	< 0.05 < 0.05	137726 2006/7006995

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolite			
							T	TA	TAA	
MN, (Asgrow AG1603)					seed		(< 0.05)	(< 0.05)	(< 0.05)	R05112 METCON_144 Max. frozen storage: 5.2 month
USA, 2005, Dumfries, MN, (Asgrow AG1603)	80 80	- 10	188 185	BBCH 77	Soya bean seed	30	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	0.08 0.06 (0.07)	137726 2006/7006995 R05113 METCON_144 Max. frozen storage: 5.2 month
USA, 2004, Grandfork, IL, (DKB38–52)	80 80	- 10	149 151	BBCH 79	Soya bean seed	30	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05) Control: 0.09	0.08 0.07 (0.08)	137726 2006/7006995 R05114 METCON_144 Max. frozen storage: 4.8 month
USA, 2005, Carlyle, IL, (NK 43-B1)	80 80	- 11	175 184	BBCH 79	Soya bean seed	30	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	0.08 0.08 (0.08)	137726 2006/7006995 R05115 METCON_144 Max. frozen storage: 3.9 month
USA, 2005, Wyoming, IL, (Asgrow 3202)	80 80	- 11	176 175	BBCH 89	Soya bean seed	31	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05) Control: 0.06	0.06 0.07 (0.07)	137726 2006/7006995 R05116 METCON_144 Max. frozen storage: 4.7 month
USA, 2005, Osceola, NB, (Pioneer 92M80)	80 80	- 10	184 189	BBCH 77	Soya bean seed	30	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	0.05 0.06 (0.06)	137726 2006/7006995 R05117 METCON_144 Max. frozen storage: 4.8 month
USA, 2005, York, NB, (Pioneer 92M80)	80 80	- 9	187 187	BBCH 77	Soya bean seed	23 30 36 43	< 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05)	0.15 0.11 (0.13) 0.07 0.09 (0.08) 0.09 < 0.05 (0.07) 0.06 0.06 (0.06)	137726 2006/7006995 R05118 METCON_144 Max. frozen storage: 5.0 month
USA, 2005, Grand Island, NB, (Dyna-Gro 37B28RR)	80 80	- 10	184 187	BBCH 77	Soya bean seed	30	0.07 0.05 (0.07) Control: 0.06	< 0.05 < 0.05 (< 0.05) Control: 0.10	0.06 0.10 (0.07)	137726 2006/7006995 R05119 METCON_144 Max. frozen storage: 4.6 month
Canada,	80	-	262	BBCH	Soya	32	0.07	< 0.05	0.08	137726

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolite			
							T	TA	TAA	
2005, Branchton, ON (Mycogen 5140RR)	80	9	299	77	bean seed		0.10 (0.07)	< 0.05 (< 0.05)	0.07 (0.07)	2006/7006995 R05120 METCON_144 Max. frozen storage: 4.7 month
USA, 2005, Wapello, IA, (Pioneer 93M11)	80 80	- 10	135 137	BBCH 75	Soya bean seed	31	0.08 0.09 (0.07) Control: 0.10	< 0.05 < 0.05 (< 0.05) Control: 0.07	0.06 0.08 (0.07)	137726 2006/7006995 R05121 METCON_144 Max. frozen storage: 4.0 month
USA, 2005, Jefferson, IA, (Pioneer 93B87)	80 80	- 9	138 131	BBCH 75	Soya bean seed	23 30 37 44	< 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) Control: 0.06	0.11 0.12 (0.12) 0.10 0.10 (0.10) 0.09 0.07 (0.08) 0.09 0.09 (0.09)	137726 2006/7006995 R05122 METCON_144 Max. frozen storage: 5.3 month
USA, 2005, Keokuk, IA, (DeKalb 3451)	80 80	- 10	138 142	BBCH 75	Soya bean seed	30	0.07 0.08 (0.08)	< 0.05 < 0.05 (< 0.05) Control: 0.08	0.21 0.13 (0.17)	137726 2006/7006995 R05123 METCON_144 Max. frozen storage: 4.1 month
USA, 2005, Conklin, MI, (Asgrow: AG1903)	80 80	- 10	192 191	BBCH 81	Soya bean seed	28	0.08 0.07 (0.08) Control: 0.08	< 0.05 < 0.05 (< 0.05) Control: 0.06	< 0.05 0.05 (0.05)	137726 2006/7006995 R05124 METCON_144 Max. frozen storage: 4.0 month
Canada, 2005, St-Pie-de-Bagot, QC, (26-02RRR)	80 80	- 11	228 215	BBCH 79	Soya bean seed	30	0.08 0.10 (0.09) Control: 0.08	< 0.05 < 0.05 (< 0.05) Control: 0.07	0.12 0.12 (0.12)	137726 2006/7006995 R05125 METCON_144 Max. frozen storage: 4.2 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Additionally, total of five field trials were conducted on soya bean in Brazil during the 2005 growing season (Dantas, 2006, METCON_145). Plants received 3 foliar applications of metconazole at nominal rates of 54 g ai/ha or 108 g ai/ha. Soya beans were harvested at 14 days after the last application. Additional samples from a decline trial were collected at 0, 7, 14, 21 and 28 days. Residues of metconazole were determined using method SOP-PA.0223 with a limit of quantification of 0.01 mg/kg. Overall mean procedural recoveries for metconazole in soya beans spiked at 0.01 and 1.0 mg/kg were 100 ± 15% (n = 6).

Table 160 Residues of metconazole in soya beans following foliar treatment (cGAP Brazil: 3×54 g ai/ha; 14 day PHI).

Location, Year (variety)	Application				Residues (mg/kg)			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole	
Brazil, 2005, Uberlandia, MG, (Monsoy 8329)	3×54	Not stated	Not stated	BBCH 89 BBCH 79 BBCH 77 BBCH 77 BBCH 74	Soya bean seed	0 7 14 21 28	0.02 < 0.01 < 0.01 < 0.013 < 0.013	Rf–1005-05 2006/1008232 EC/CD/F/2005/022/BRV/A1 METCON_145 Max. frozen storage: not stated
Brazil, 2005, Uberlandia, MG, (Monsoy 8329)	3×54	Not stated	Not stated	BBCH 77	Soya bean seed	14	< 0.01	Rf–1005-05 2006/1008232 EC/R/F/2005/022/BRV/A1 METCON_145 Max. frozen storage: not stated
	3×108	Not stated	Not stated	BBCH 77	Soya bean seed	14	< 0.01	
Brazil, 2005, Ponta Grossa, PR, (BR–16)	3×54	Not stated	Not stated	BBCH 87	Soya bean seed	14	0.02	Rf–1005-05 2006/1008232 EC/R/F/2005/022/BRT/A1 METCON_145 Max. frozen storage: not stated
	3×108	Not stated	Not stated	BBCH 87	Soya bean seed	14	0.04	
Brazil, 2005, Guarapuava, PR, (Monsoy 8329)	3×54	Not stated	Not stated	BBCH 87	Soya bean seed	14	0.01	Rf–1005-05 2006/1008232 EC/R/F/2005/022/BRT/B1 METCON_145 Max. frozen storage: not stated
	3×108	Not stated	Not stated	BBCH 87	Soya bean seed	14	0.01	
Brazil, 2005, Campo Alegre, Goias, (Lideranca)	3×54	Not stated	Not stated	BBCH 77	Soya bean seed	14	< 0.01	Rf–1005-05 2006/1008232 EC/R/F/2005/022/BRV/B1 METCON_145 Max. frozen storage: not stated
	3×108	Not stated	Not stated	BBCH 77	Soya bean seed	14	< 0.01	

Root and tuber vegetables

Potato

A total of 17 field trials were conducted on potato in the USA during the 2007 growing season (Corley, 2010, METCON_146). Plants received 4 foliar applications of metconazole at nominal rates of approximately 140 g ai/ha. Two trials also received additionally an exaggerated rate used for a processing study. Tubers were harvested at 1–2 days after the last application. Additional samples from decline trials were collected at 3, 7 and 14 days. Residues of *cis*- and *trans*-metconazole were determined using method RM–41C–1with a limit of quantification of 0.02 mg/kg. Overall mean procedural recoveries for *cis*- and *trans*-metconazole in dry beans spiked at 0.02–2.0 mg/kg were within 70–120% with an RSD of <20%. Triazole metabolites (1,2,4-triazole, triazolyl alanine, and triazolyl acetic acid) were determined using method Meth–160 with a limit of quantification of 0.02 mg/kg. Overall mean procedural recoveries for all metabolites spiked at 0.02–2.0 mg/kg were within 70–120% with an RSD of <20%.

Table 161 Residues of *cis*- and *trans*-metconazole in potato tubers following foliar treatment (cGAP USA: 4×140 g ai/ha; 1 days PHI)

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
USA, 2007, Freeville, NY, (Yukon Gold)	144 140 142 141	- 7 8 6	269 263 265 264	Natural senescence	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2010/1232552 07-NY10 METCON_146 Max. frozen storage: 3 months
USA, 2007, Wooster, OH, (Norland Red) [b]	139 138 140 141	- 7 7 7	201 195 197 202	Vegetative	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2010/1232552 07-OH*11 METCON_146 Max. frozen storage: 2.3 months
USA, 2007, Wooster, OH, (Superior) [b]	139 140 139 141	- 7 7 7	201 195 197 202	Vegetative	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2010/1232552 07-OH*12 METCON_146 Max. frozen storage: 2.1 months
USA, 2007, Bridgeton, NJ, (Superior)	141 141 140 138	- 7 7 7	238 239 251 251	Senescing	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2010/1232552 07-NJ26 METCON_146 Max. frozen storage: 1.7 months
USA, 2007, Salisbury, MD, (Kennebec)	142 142 141 141	- 7 7 7	180 180 179 179	Fully mature	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2010/1232552 07-MD14 METCON_146 Max. frozen storage: 2.1 months
USA, 2007, Citra, FL, (Fabula)	147 149 149 149	- 7 7 7	196 197 198 198	Mature tubers	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2010/1232552 07-FL18 METCON_146 Max. frozen storage: 4.2 months
USA, 2007, Arlington, WI, (Superior)	143 143 146 148	- 8 6 7	194 198 205 215	Tuber bulking	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2010/1232552 07-WI21 METCON_146 Max. frozen storage: 2.3 months
USA, 2007, Fargo, ND, (Red Norland)	140 140 140 140	- 6 7 8	166 166 167 166	Early senescence	Tuber	1 3 7 14	< 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 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 (< 0.04) < 0.04 < 0.04 (< 0.04) < 0.04 < 0.04 (< 0.04)	2010/1232552 07-ND10 METCON_146 Max. frozen storage: 2.6 months
USA, 2007, Weslaco, TX, (Atlantic)	141 140 141 140	- 7 7 7	205 200 202 199	Vegetative	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2010/1232552 07-TX28 METCON_146 Max. frozen

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
	704 704 706 700 703	- 7 7 7 5	205 201 202 200 203	Vegetative	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	storage: 1.2 months
USA, 2007, La Salle, CO, (Russet Norkotah)	152 146 150 149	- 7 7 7	204 195 200 193	Vegetative, senescing	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2010/1232552 07-CO13 METCON_146 Max. frozen storage: 2.5 months
USA, 2007, Riverside, CA, (Cal While)	141 141 144 146	- 7 7 7	235 235 240 241	Post-flowering	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2010/1232552 07-CA63 METCON_146 Max. frozen storage: 1.8 months
USA, 2007, Moxee, WA, (Russet Burbank)	139 139 139 139	- 7 8 6	239 239 237 239	Vegetative	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2010/1232552 07-WA*18 METCON_146 Max. frozen storage: 2.5 months
USA, 2007, Moxee, WA, (Pontiac)	137 140 142 140	- 7 7 7	154 158 160 157	Vegetative	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2010/1232552 07-WA*19 METCON_146 Max. frozen storage: 2.8 months
USA, 2007, Prosser, WA, (Russet Burbank) [b]	145 144 142 141	- 7 7 6	277 275 273 275	Vegetative	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2010/1232552 07-WA*20 METCON_146 Max. frozen storage: 2.8 months
USA, 2007, Prosser, WA, (Yukon Gold) [b]	139 141 141 141	- 7 7 6	272 270 269 274	Vegetative	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2010/1232552 07-WA*33 METCON_146 Max. frozen storage: 2.5 months
	688 706 703 702	- 7 7 6	272 270 269 274	Vegetative	Tuber	1	< 0.02	< 0.02	< 0.04	
USA, 2007, Kimberly, ID, (Red Norland) [b]	137 142 144 140	- 7 6 6	183 189 192 187	Maturing	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	2010/1232552 07-ID11 METCON_146 Max. frozen storage: 2.6 months
USA, 2007, Kimberly, ID, (Red Norland) [b]	137 142 143 142	- 7 6 6	228 236 238 237	Maturing	Tuber	1 4 8 15	< 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 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 (< 0.04) < 0.04 < 0.04 (< 0.04) < 0.04 < 0.04 (< 0.04)	2010/1232552 07-ID10 METCON_146 Max. frozen storage: 2.2 months

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] It was noted that trials OH*11 and OH*12, ID10 and ID11 and WA*20 and WA*33 were performed at the same location and year and therefore could not be considered as independent.

Table 162 Residues of 1,2,4-triazole, triazolyl alanine, and triazolyl acetic acid in potato tubers following foliar treatment (cGAP USA: 4×140 g ai/ha; 1 days PHI).

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	T	TA	TAA	
USA, 2007, Freeville, NY, (Yukon Gold)	144 140 142 141	- 7 8 6	269 263 265 264	Natural senescence	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	2010/1232552 07-NY10 METCON_146 Max. frozen storage: 17 months
USA, 2007, Wooster, OH, (Norland Red)	139 138 140 141	- 7 7 7	201 195 197 202	Vegetative	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	2010/1232552 07-OH*11 METCON_146 Max. frozen storage: 17 months
USA, 2007, Wooster, OH, (Superior)	139 140 139 141	- 7 7 7	201 195 197 202	Vegetative	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	2010/1232552 07-OH*12 METCON_146 Max. frozen storage: 17 months
USA, 2007, Bridgeton, NJ, (Superior)	141 141 140 138	- 7 7 7	238 239 251 251	Senescing	Tuber	1	< 0.02 < 0.02 (< 0.02)	0.031 0.031 (0.031)	< 0.02 < 0.02 (< 0.02) Control: 0.013	2010/1232552 07-NJ26 METCON_146 Max. frozen storage: 17 months
USA, 2007, Salisbury, MD, (Kennebec)	142 142 141 141	- 7 7 7	180 180 179 179	Fully mature	Tuber	1	< 0.02 < 0.02 (< 0.02)	0.074 0.075 (0.075)	< 0.02 < 0.02 (< 0.02) Control: 0.038	2010/1232552 07-MD14 METCON_146 Max. frozen storage: 18 months
USA, 2007, Citra, FL, (Fabula)	147 149 149 149	- 7 7 7	196 197 198 198	Mature tubers	Tuber	1	< 0.02 < 0.02 (< 0.02)	0.029 0.022 (0.026)	< 0.02 < 0.02 (< 0.02) Control: 0.006	2010/1232552 07-FL18 METCON_146 Max. frozen storage: 18 months
USA, 2007, Arlington, WI, (Superior)	143 143 146 148	- 8 6 7	194 198 205 215	Tuber bulking	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	2010/1232552 07-WI21 METCON_146 Max. frozen storage: 17 months

Location, Year (variety)	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Residues (mg/kg) [a] Sample	DALA	T	TA	TAA	Report/Trial No., Reference, Storage period
USA, 2007, Fargo, ND, (Red Norland)	140 140 140 140	- 6 7 8	166 166 167 166	Early senescence	Tuber	1 3 7 14	< 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02)	0.022 0.022 (0.022) 0.025 0.027 (0.026) 0.028 0.026 (0.027) 0.024 0.028 (0.026)	< 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) Control: 0.013	2010/1232552 07-ND10 METCON_146 Max. frozen storage: 16 months
USA, 2007, Weslaco, TX, (Atlantic)	141 140 141 140	- 7 7 7	205 200 202 199	Vegetative	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	2010/1232552 07-TX28 METCON_146 Max. frozen storage: 21 months
	704 704 706 700 703	- 7 7 7 5	205 201 202 200 203	Vegetative	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	
USA, 2007, La Salle, CO, (Russet Norkotah)	152 146 150 149	- 7 7 7	204 195 200 193	Vegetative, senescing	Tuber	1	< 0.02 < 0.02 (< 0.02)	0.049 0.043 (0.046)	< 0.02 < 0.02 (< 0.02) Control: 0.014	2010/1232552 07-CO13 METCON_146 Max. frozen storage: 18 months
USA, 2007, Riverside, CA, (Cal While)	141 141 144 146	- 7 7 7	235 235 240 241	Post-flowering	Tuber	1	< 0.02 < 0.02 (< 0.02)	0.048 0.050 (0.049)	< 0.02 < 0.02 (< 0.02) Control: 0.025	2010/1232552 07-CA63 METCON_146 Max. frozen storage: 14 month
USA, 2007, Moxee, WA, (Russet Burbank)	139 139 139 139	- 7 8 6	239 239 237 239	Vegetative	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	2010/1232552 07-WA*18 METCON_146 Max. frozen storage: 16 months
USA, 2007, Moxee, WA, (Pontiac)	137 140 142 140	- 7 7 7	154 158 160 157	Vegetative	Tuber	1	< 0.02 < 0.02 (< 0.02)	0.020 0.022 (0.021)	< 0.02 < 0.02 (< 0.02) Control: 0.022	2010/1232552 07-WA*19 METCON_146 Max. frozen storage: 17 months
USA, 2007, Prosser, WA, (Russet Burbank)	145 144 142 141	- 7 7 6	277 275 273 275	Vegetative	Tuber	1	< 0.02 < 0.02 (< 0.02)	0.050 0.028 (0.039)	< 0.02 < 0.02 (< 0.02) Control: 0.069	2010/1232552 07-WA*20 METCON_146 Max. frozen storage: 16 months
USA, 2007, Prosser, WA, (Yukon	139 141 141 141	- 7 7 6	272 270 269 274	Vegetative	Tuber	1	< 0.02 < 0.02 (< 0.02)	0.054 0.055 (0.055)	< 0.02 < 0.02 (< 0.02) Control: 0.042	2010/1232552 07-WA*33 METCON_146 Max. frozen storage: 16

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	T	TA	TAA	
Gold)	688 706 703 702	- 7 7 6	272 270 269 274	Vegetative	Tuber	1	< 0.02	0.066	< 0.02 Control: 0.039	months
USA, 2007, Kimberly, ID, (Red Norland)	137 142 144 140	- 7 6 6	183 189 192 187	Maturing	Tuber	1	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	2010/1232552 07-ID11 METCON_146 Max. frozen storage: 17 months
USA, 2007, Kimberly, ID, (Red Norland)	137 142 143 142	- 7 6 6	228 236 238 237	Maturing	Tuber	1 4 8 15	< 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02)	2010/1232552 07-ID10 METCON_146 Max. frozen storage: 16 months

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Sugar beet

A total of 12 field trials were conducted on sugar beet in the USA during the 2005 growing season (Jordan & Saha, 2006, METCON_147). Plants received 2 foliar applications of metconazole at nominal rates of 110–120 g ai/ha or 160–170 g ai/ha. Sugar beet roots were harvested at 13–15 days after the last application. Additional samples from decline trials were collected at 1, 7, 14–15, 21, and 27–28days. Residues of cis- and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0508. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of <20%.

Residues of metabolites M11, M21, M30, 1,2,4-triazole, triazolyl alanine and triazolyl acetic acid were each below their respective LOQs of 0.01 or 0.05 mg/kg mg/kg in all trials.

Table 163 Residues of *cis*- and *trans*-metconazole in sugar beet roots following foliar treatment (cGAP Canada: 2×113 g ai/ha; 14 days PHI).

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
USA, 2005, Dumfries, MN, (VDH66556 8232 Medium)	114 113	- 14	189 190	Crop cover complete	Root	14	< 0.005 0.006 (0.005)	< 0.005 < 0.005 (< 0.005)	< 0.010 0.011 (<u>0.010</u>)	137714 2006/7006726 RCN R05085 METCON_147 Max. frozen storage: 5.7 month
	170 168	- 14	188 189	Crop cover complete	Root	14	< 0.005 0.006 (0.005)	< 0.005 < 0.005 (< 0.005)	0.011 < 0.010 (0.010)	
USA, 2005, Theilman, MN, (VDH66556 8232	113 111	- 14	188 188	Crop cover complete	Root	14	< 0.005 0.005 (0.005)	< 0.005 < 0.005 (< 0.005)	(< 0.010 0.010 (<u>0.010</u>)	137714 2006/7006726 RCN R05086

Location, Year (variety) Medium)	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Residues (mg/kg) [a] Sample	DALA	Metconazole *cis*-	*trans*-	Total	Report/Trial No., Reference, Storage period
	170 168	- 14	188 189	Crop cover complete	Root	14	0.011 0.008 (0.010)	< 0.005 < 0.005 (< 0.005)	0.016 0.013 (0.015)	METCON_147 Max. frozen storage: 5.7 month
USA, 2005, Arkansaw, WI, (VDH66556 8232 Medium)	110 112	- 15	187 187	Crop cover complete	Root	1 7 14 21 28 	< 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005)	< 0.010 < 0.010 (< 0.010) < 0.010 < 0.010 (< 0.010) < 0.010 < 0.010 (< 0.010) < 0.010 < 0.010 (< 0.010) < 0.010 < 0.010 (< 0.010)	137714 2006/7006726 RCN R05087 METCON_147 Max. frozen storage: 6.3 month
	168 169	- 15	189 188	Crop cover complete	Root	1 7 14 21 28 	< 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005)	< 0.010 < 0.010 (< 0.010) < 0.010 < 0.010 (< 0.010) < 0.010 < 0.010 (< 0.010) < 0.010 < 0.010 (< 0.010) < 0.010 < 0.010 (< 0.010)	
USA, 2005, Fitchburg, WI, (Vanderhave VDH 66556) [b]	113 112	- 15	209 226	Crop cover complete	Root	13	0.031 0.018 (0.025)	0.008 < 0.005 (0.006)	0.039 0.023 (0.031)	137714 2006/7006726 RCN R05088 METCON_147 Max. frozen storage: 5.3 month
	167 164	- 15	207 220	Crop cover complete	Root	13	0.026 0.024 (0.025)	0.005 0.006 (0.006)	0.031 0.029 (0.030)	
USA, 2005, Fitchburg, WI, (VanderhaveVDH 66556) [b]	113 114	- 13	220 217	Crop cover complete	Root	14	0.032 0.039 (0.036)	0.007 0.009 (0.008)	0.040 0.048 (0.044)	137714 2006/7006726 RCN R05089 METCON_147 Max. frozen storage: 5.3 month
	166 163	- 13	217 204	Crop cover complete	Root	14	0.067 0.070 (0.069)	0.015 0.015 (0.015)	0.082 0.084 (0.083)	
USA, 2005, Eldridge, ND, (66453)	114 113	- 13	186 183	Root harvestable size	Root	14	0.019 0.010 (0.015)	< 0.005 (0.005)	0.024 0.015 (0.020)	137714 2006/7006726 RCN R05090 METCON_147 Max. frozen storage: 6.0 month
	175 172	- 13	190 185	Root harvest-able size	Root	14	0.012 0.016 (0.014)	< 0.005 (0.005)	0.017 0.021 (0.019)	
USA, 2005, Levelland, TX, (Eagle R)	112 113	- 13	190 188	Canopy 80% closed	Root	14	< 0.005 (< 0.005)	< 0.005 0.006 (0.005)	< 0.010 0.011 (0.010)	137714 2006/7006726 RCN R05091 METCON_147 Max. frozen storage: 5.3 month
	168 170	- 13	188 189	Canopy 80% closed	Root	14	0.005 0.009 (0.007)	< 0.005 0.007 (0.006)	0.014 0.013 (0.014)	
USA, 2005, Pavillion, MT, (Treasure)	171 168	- 14	171 168	Fully mature	Root	14	0.009 0.006 (0.01)	0.014 0.008 (0.01)	0.023 0.014 (0.02)	137714 2006/7006726 RCN R05092

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
	158 172	- 14	156 172	Fully mature	Root	14	0.018 0.035 (0.03)	0.005 0.007 (0.01)	0.024 0.043 (0.03)	METCON_147 Max. frozen storage: 5.8 month
USA, 2005, Hughson, CA, (Unknown)	113 114	- 14	236 238	Crop cover complete	Root	14	0.01 < 0.005 (0.01)	0.016 0.007 (0.01)	0.026 0.012 (0.02)	137714 2006/7006726 RCN R05093
	169 169	- 14	235 235	Crop cover complete	Root	14	0.006 < 0.005 (0.01)	0.008 0.007 (0.01)	0.013 0.012 (0.01)	METCON_147 Max. frozen storage: 5.8 month
USA, 2005, Hickamn, CA, (Unknown)	112 109	- 14	234 228	Crop cover complete	Root	14	0.013 0.013 (0.01)	0.021 < 0.005 (0.02)	0.034 0.018 (0.03)	137714 2006/7006726 RCN R05094
	171 165	- 14	238 230	Crop cover complete	Root	14	0.01 0.015 (0.01)	0.016 < 0.005 (0.02)	0.025 0.02 (0.02)	METCON_147 Max. frozen storage: 5.8 month
USA, 2005, Payette, ID, (HM WS91)	114 111	- 14	286 278	Root harvest-able size	Root	1 7 15 21 27 	0.008 0.007 (0.01) 0.025 0.013 (0.02) 0.014 0.009 (0.01) 0.006 < 0.005 (0.01) 0.006 0.007 (0.01)	< 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005)	0.013 0.012 (0.01) 0.03 0.018 (0.02) 0.019 0.014 (0.02) 0.011 < 0.01 (0.01) 0.011 0.012 (0.01)	137714 2006/7006726 RCN R05095 METCON_147 Max. frozen storage: 6.0 month
	166 164	- 14	278 274	Root harvestable size	Root	1 7 15 21 27 	0.011 0.006 (0.01) 0.023 0.017 (0.02) 0.015 0.023 (0.02) 0.013 0.009 (0.01) 0.009 0.008 (0.01)	< 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005)	0.016 0.011 (0.01) 0.028 0.022 (0.03) 0.02 0.028 (0.02) 0.018 0.014 (0.02) 0.014 0.013 (0.01)	
USA, 2005, Jerome, ID, (Beta 8422)	113 111	- 14	177 180	Root harvestable size	Root	14	0.018 0.015 (0.02)	< 0.005 < 0.005 (< 0.005)	0.023 0.020 (0.022)	137714 2006/7006726 RCN R05096
	171 169	- 14	178 196	Root harvestable size	Root	14	0.032 0.034 (0.03)	0.007 0.007 (0.01)	0.039 0.041 (0.04)	METCON_147 Max. frozen storage: 6.0 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] It was noted that trial RCN R05088 and RCN R05089 were performed at the same location and year and therefore could not be considered as independent.

Cereal grains

Wheat

A total of 15 field trials were conducted on wheat in the Canada and the USA during the 2004-05 growing seasons (White & Saha, 2006, METCON_152). Plants received 2 foliar applications of metconazole at nominal rates of 110 g ai/ha. Wheat grain was harvested at 20–22 days after the last application. Additional samples from a decline trial were collected at 14, 21–22, 28 and 35–36 days. Residues of cis- and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0508. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of <20%.

Table 164 Residues of *cis*- and *trans*-metconazole in wheat grain following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2005, Sunsweet, GA (Pioneer 26R24)	2 × 110	8	134 140	85	21	Grain	0.030 0.027 (0.029)	0.007 0.007 (0.007)	0.037 0.035 (0.036)	137711 2006/7006723 RCN R05044 METCON_152 Max. frozen storage: 7.9 month
USA, 2005, Newport, AK (Genesis R033)	2 × 0.11	6	187 189	75	21	Grain	0.076 0.083 (0.080)	0.011 0.017 (0.014)	0.087 0.10 (0.094)	137711 2006/7006723 RCN R05045 METCON_152 Max. frozen storage: 7.6 month
USA, 2005, York, NE, (Millenium)	2 × 0.11	7	186 188	83	20	Grain	0.012 0.016 (0.014)	0.005 < 0.005 (0.005)	0.017 0.021 (0.019)	137711 2006/7006723 RCN R05046 METCON_152 Max. frozen storage: 6.5 month
USA, 2005, Carlyle, IL, (Excel 201)	2 × 0.11	7	115 158	83	14 21 28 35	Grain Grain Grain Grain	0.028 0.040 (0.034) 0.065 0.051 (0.058) 0.042 0.046 (0.044) 0.031 0.039 (0.035)	0.007 < 0.005 (0.006) 0.011 0.010 (0.011) 0.008 < 0.005 (0.007) < 0.005 0.009 (0.007)	0.034 0.045 (0.040) 0.077 0.062 (0.070) 0.051 0.051 (0.051) 0.036 0.048 (0.042)	137711 2006/7006723 RCN R05047 METCON_152 Max. frozen storage: 7.2 month
USA, 2005, Grand Island, NE (Jagalene HRW)	2 × 0.11	7	188 189	77	22	Grain	0.012 0.008 (0.010)	< 0.005 < 0.005 (< 0.005)	0.017 0.013 (0.015)	137711 2006/7006723 RCN R05048 METCON_152

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
										Max. frozen storage: 6.5 month
USA, 2005, Velva, ND (Dapps)	2 × 0.11	7	113 113	75	20	Grain	0.031 0.032 (0.032)	0.009 0.009 (0.009)	0.039 0.040 (0.040)	137711 2006/7006723 RCN R05049 METCON_152 Max. frozen storage: 5.7 month
USA, 2005, Gardner, ND (Knudson)	2 × 0.12	6	152 147	77	14 22 28 36	Grain Grain Grain Grain	0.013 0.017 (0.015) 0.009 0.011 (0.010) 0.008 0.008 (0.008) 0.007 0.008 (0.008)	< 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005) < 0.005 < 0.005 (< 0.005)	0.018 0.022 (0.020) 0.014 0.016 (0.015) 0.013 0.013 (0.013) 0.012 0.013 (0.013)	137711 2006/7006723 RCN R05050 METCON_152 Max. frozen storage: 5.5 month
USA, 2005, Hinton, OK (Jagalene)	2 × 0.11	7	122 126	85	22	Grain	0.006 0.006 (0.006)	< 0.005 < 0.005 (< 0.005)	0.011 0.011 (0.011)	137711 2006/7006723 RCN R05051 METCON_152 Max. frozen storage: 7.5 month
USA, 2005, Colony, OK (Jagger)	1 × 0.11 1 × 0.09	7	128 105	85	21	Grain	0.097 0.063 (0.080)	0.019 0.013 (0.016)	0.12 0.075 (0.096)	137711 2006/7006723 RCN R05052 METCON_152 Max. frozen storage: 7.5 month
USA, 2005, Lubbock, TX (TAM 200)	2 × 0.11	8	141 138	87	21	Grain	0.026 0.031 (0.029)	0.005 0.006 (0.006)	0.032 0.037 (0.035)	137711 2006/7006723 RCN R05053 METCON_152 Max. frozen storage: 7.2 month
USA, 2005, Payette, ID (Penawawa)	2 × 0.11	6	278 283	87	21	Grain	0.043 0.038 (0.041)	0.008 0.007 (0.008)	0.051 0.045 (0.048)	137711 2006/7006723 RCN R05054 METCON_152 Max. frozen storage: 5.3 month
Canada, 2005, Laird, SK (Bounty)	2 × 0.11	6	135 149	85	21	Grain	0.019 0.017 (0.018)	< 0.005 < 0.005 (< 0.005)	0.024 0.022 (0.023)	137711 2006/7006723 RCN R05055

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
										METCON_152 Max. frozen storage: 4.7 month
Canada, 2005, Minto, MB (AC Barrie)	2 × 0.11	6	218 197	85	21	Grain	0.020 0.023 (0.022)	< 0.005 < 0.005 (< 0.005)	0.025 0.028 (0.027)	137711 2006/7006723 RCN R05056 METCON_152 Max. frozen storage: 4.9 month
Canada, 2005, Innisfail, AB (AC Intrepid)	2 × 0.11	7	226 233	85	21	Grain	0.022 0.022 (0.022)	0.005 0.005 (0.005)	0.028 0.027 (0.028)	137711 2006/7006723 RCN R05057 METCON_152 Max. frozen storage: 4.1 month
Canada, 2005, Innisfail, AB (5700PR)	2 × 0.11	7	202 225	85	21	Grain	0.044 0.044 (0.044)	0.010 0.010 (0.010)	0.054 0.054 (0.054)	137711 2006/7006723 RCN R05058 METCON_152 Max. frozen storage: 4.2 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 165 Residues of metabolites M11, M21 and M30 in wheat grain following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
USA, 2005, Sunsweet, GA (Pioneer 26R24)	2 × 0.11	8	134 140	85	21	Grain	0.02 0.02 (0.02)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137711 2006/7006723 RCN R05044 METCON_152 Max. frozen storage: 7.9 month
USA, 2005, Newport, AK (Genesis R033)	2 × 0.11	6	187 189	75	21	Grain	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137711 2006/7006723 RCN R05045 METCON_152 Max. frozen storage: 7.6 month
USA, 2005, York, NE, (Millenium)	2 × 0.11	7	186 188	83	20	Grain	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137711 2006/7006723 RCN R05046 METCON_152 Max. frozen storage: 6.5 month
USA, 2005, Carlyle,	2 × 0.11	7	115 158	83	14	Grain	0.01 0.02	< 0.01 < 0.01	< 0.01 < 0.01	137711 2006/7006723

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				M11	M21	M30	
IL, (Excel 201)					21 28 35	Grain Grain Grain	(0.02) 0.03 0.03 (0.03) 0.02 0.02 (0.02) 0.04 0.04 (0.04)	(< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01)	(< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01)	RCN R05047 METCON_152 Max. frozen storage: 7.2 month
USA, 2005, Grand Island, NE (Jagalene HRW)	2 × 0.11	7	188 189	77	22	Grain	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137711 2006/7006723 RCN R05048 METCON_152 Max. frozen storage: 6.5 month
USA, 2005, Velva, ND (Dapps)	2 × 0.11	7	113 113	75	20	Grain	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137711 2006/7006723 RCN R05049 METCON_152 Max. frozen storage: 5.7 month
USA, 2005, Gardner, ND (Knudson)	2 × 0.12	6	152 147	77	14 22 28 36	Grain Grain Grain Grain	< 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 0.010 (0.01) 0.01 0.01 (0.01)	< 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01)	137711 2006/7006723 RCN R05050 METCON_152 Max. frozen storage: 5.5 month
USA, 2005, Hinton, OK (Jagalene)	2 × 0.11	7	122 126	85	22	Grain	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137711 2006/7006723 RCN R05051 METCON_152 Max. frozen storage: 7.5 month
USA, 2005, Colony, OK (Jagger)	1 × 0.11 1 × 0.09	7	128 105	85	21	Grain	0.020 0.010 (0.025)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137711 2006/7006723 RCN R05052 METCON_152 Max. frozen storage: 7.5 month
USA, 2005, Lubbock, TX (TAM 200)	2 × 0.11	8	141 138	87	21	Grain	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137711 2006/7006723 RCN R05053 METCON_152 Max. frozen storage: 7.2 month
USA, 2005, Payette, ID	2 × 0.11	6	278 283	87	21	Grain	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137711 2006/7006723 RCN R05054

Location, Year (variety (Penawawa)	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
										METCON_152 Max. frozen storage: 5.3 month
Canada, 2005, Laird, SK (Bounty)	2 × 0.11	6	135 149	85	21	Grain	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137711 2006/7006723 RCN R05055 METCON_152 Max. frozen storage: 4.7 month
Canada, 2005, Minto, MB (AC Barrie)	2 × 0.11	6	218 197	85	21	Grain	0.020 0.020 (0.020)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137711 2006/7006723 RCN R05056 METCON_152 Max. frozen storage: 4.9 month
Canada, 2005, Innisfail, AB (AC Intrepid)	2 × 0.11	7	226 233	85	21	Grain	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137711 2006/7006723 RCN R05057 METCON_152 Max. frozen storage: 4.1 month
Canada, 2005, Innisfail, AB (5700PR)	2 × 0.11	7	202 225	85	21	Grain	0.020 0.020 (0.020)	0.010 < 0.01 (0.010)	< 0.01 < 0.01 (< 0.01)	137711 2006/7006723 RCN R05058 METCON_152 Max. frozen storage: 4.2 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] Residues of metabolites M11, M21 and M30 are expressed as parent equivalent (conversion factors 0.95, 0.95 and 0.96, respectively). For calculations, 0.01 mg/kg was used for residues below or at the LOQ for metabolites M11, M21 and M30.

Table 166 Residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), and triazolyl acetic acid (TAA) in wheat grain following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] T	TA	TAA	Residues found [mg/kg] [1, 2]
USA, 2005, Sunsweet, GA (Pioneer 26R24)	2 × 0.11	8	134 140	85	21	Grain	< 0.05 < 0.05 (< 0.05)	0.69 0.61 (0.65)	0.36 0.32 (0.34)	137711 2006/7006723 RCN R05044 METCON_152 Max. frozen storage: 7.9 month
USA, 2005, Newport, AK (Genesis R033)	2 × 0.11	6	187 189	75	21	Grain	< 0.05 < 0.05 (< 0.05)	0.091 0.086 (0.089)	< 0.05 < 0.05 (< 0.05)	137711 2006/7006723 RCN R05045 METCON_152 Max. frozen storage: 7.6 month
USA, 2005, York,	2 × 0.11	7	186 188	83	20	Grain	< 0.05 < 0.05	0.13 0.14	0.081 0.11	137711 2006/7006723

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a]			Residues found [mg/kg] [1, 2]
	g ai/ha	Interval (days)	L/ha				T	TA	TAA	
NE, (Millenium)							(< 0.05)	(0.14) Control: 0.079	(0.09) Control: 0.061	RCN R05046 METCON_152 Max. frozen storage: 6.5 month
USA, 2005, Carlyle, IL, (Excel 201)	2 × 0.11	7	115 158	83	14 21 28 35	Grain Grain Grain Grain	< 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05)	< 0.05 0.059 (0.055) 0.060 < 0.05 (0.055) 0.060 < 0.05 (0.055) < 0.05 0.053 (0.050)	< 0.05 < 0.05 (< 0.05) < 0.05 0.054 (0.052) 0.051 < 0.05 (0.051) < 0.05 < 0.05 (< 0.05)	137711 2006/7006723 RCN R05047 METCON_152 Max. frozen storage: 7.2 month
USA, 2005, Grand Island, NE (Jagalene HRW)	2 × 0.11	7	188 189	77	22	Grain	< 0.05 < 0.05 (< 0.05)	0.11 0.068 (0.091) Control: 0.076	0.088 0.056 (0.072)	137711 2006/7006723 RCN R05048 METCON_152 Max. frozen storage: 6.5 month
USA, 2005, Velva, ND (Dapps)	2 × 0.11	7	113 113	75	20	Grain	< 0.05 < 0.05 (< 0.05)	0.11 0.14 (0.13) Control: 0.058	< 0.05 < 0.05 (< 0.05)	137711 2006/7006723 RCN R05049 METCON_152 Max. frozen storage: 5.7 month
USA, 2005, Gardner, ND (Knudson)	2 × 0.12	6	152 147	77	14 22 28 36	Grain Grain Grain Grain	< 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05)	0.15 0.15 (0.15) 0.15 0.14 (0.15) 0.13 0.14 (0.13) 0.15 0.13 (0.14) Control: 0.12	0.093 0.080 (0.087) 0.076 0.076 (0.076) 0.068 0.070 (0.069) 0.063 0.071 (0.070) Control: 0.073	137711 2006/7006723 RCN R05050 METCON_152 Max. frozen storage: 5.5 month
USA, 2005, Hinton, OK (Jagalene)	2 × 0.11	7	122 126	85	22	Grain	< 0.05 < 0.05 (< 0.05)	0.053 < 0.05 (0.052)	< 0.05 < 0.05 (< 0.05)	137711 2006/7006723 RCN R05051 METCON_152 Max. frozen storage: 7.5 month
USA, 2005, Colony, OK (Jagger)	1 × 0.11 1 × 0.09	7	128 105	85	21	Grain	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137711 2006/7006723 RCN R05052 METCON_152 Max. frozen storage: 7.5 month
USA, 2005, Lubbock,	2 × 0.11	8	141 138	87	21	Grain	< 0.05 < 0.05	< 0.05 < 0.05	< 0.05 < 0.05	137711 2006/7006723

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] T	TA	TAA	Residues found [mg/kg][1, 2]
TX (TAM 200)							(< 0.05)	(< 0.05)	(< 0.05)	RCN R05053 METCON_152 Max. frozen storage: 7.2 month
USA, 2005, Payette, ID (Penawawa)	2 × 0.11	6	278 283	87	21	Grain	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137711 2006/7006723 RCN R05054 METCON_152 Max. frozen storage: 5.3 month
Canada, 2005, Laird, SK (Bounty)	2 × 0.11	6	135 149	85	21	Grain	< 0.05 < 0.05 (< 0.05)	0.097 0.095 (0.096) Control: 0.057	< 0.05 < 0.05 (< 0.05)	137711 2006/7006723 RCN R05055 METCON_152 Max. frozen storage: 4.7 month
Canada, 2005, Minto, MB (AC Barrie)	2 × 0.11	6	218 197	85	21	Grain	< 0.05 < 0.05 (< 0.05)	0.61 0.66 (0.64) Control: 0.30	0.27 0.29 (0.28) Control: 0.12	137711 2006/7006723 RCN R05056 METCON_152 Max. frozen storage: 4.9 month
Canada, 2005, Innisfail, AB (AC Intrepid)	2 × 0.11	7	226 233	85	21	Grain	< 0.05 < 0.05 (< 0.05)	0.068 0.078 (0.073)	< 0.05 < 0.05 (< 0.05)	137711 2006/7006723 RCN R05057 METCON_152 Max. frozen storage: 4.1 month
Canada, 2005, Innisfail, AB (5700PR)	2 × 0.11	7	202 225	85	21	Grain	< 0.05 < 0.05 (< 0.05)	0.25 0.23 (0.24) Control: 0.16	0.18 0.18 (0.18) Control: 0.12	137711 2006/7006723 RCN R05058 METCON_152 Max. frozen storage: 4.2 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Rye

A total of five field trials were conducted on rye in the Canada and the USA during the 2004-05 growing seasons (Jordan & Saha, 2006, METCON_151). Plants received 2 foliar applications of metconazole at nominal rates of 112 g ai/ha. Rye grain was harvested at 20–22 days after the last application. Additional samples from a decline trial were collected at 14, 21, 28 and 34 days. Residues of cis- and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0508. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120%.

Table 167 Residues of *cis*- and *trans*-metconazole in rye grain following foliar treatment (cGAP USA: 2 × 112 g ai/ha; 30 days PHI).

Location,	Application	Growth	DALA	Sample	Residues found [mg/kg] [a]	Report/Trial No.,

Year (variety	g ai/ha	Interval (days)	L/ha	stage at final appl.			Metconazole *cis*	Metconazole *trans*	Total	Reference, Storage period
USA, 2005, Chula, GA (Wrens Abruzzi)	2 × 110	7	136 127	Soft dough	21	Grain	0.044 0.032 (0.038)	0.011 0.008 (0.010)	0.055 0.040 (0.048)	137720 2006/7006725 R05145 METCON_151 Max. frozen storage: 12 month
USA, 2005, York, NE, (VNS Winter Rye)	2 × 110	7	188 188	Late milk	22	Grain	0.048 0.066 (0.057)	0.009 0.013 (0.011)	0.057 0.079 (0.068)	137720 2006/7006725 R05146 METCON_151 Max. frozen storage: 10 month
USA, 2005, Eldridge, ND, (Dahcold)	1× 110 1× 120	6	143 149	Late milk	14 21 28 34	Grain Grain Grain Grain	0.051 0.067 (0.059) 0.053 0.057 (0.055) 0.052 0.045 (0.049) 0.057 0.064 (0.061)	0.011 0.015 (0.013) 0.012 0.013 (0.013) 0.012 0.010 (0.011) 0.013 0.014 (0.014)	0.062 0.082 (0.072) 0.064 0.070 (0.067) 0.064 0.055 (0.060) 0.070 0.078 (0.074)	137720 2006/7006725 R05147 METCON_151 Max. frozen storage: 9.6 month
Canada, 2005, Rosthern, SK (Gazelle)	2 × 110	8	204 200	Soft dough	20	Grain	0.074 0.074 (0.074)	0.019 0.018 (0.019)	0.093 0.092 (0.093)	137720 2006/7006725 R05148 METCON_151 Max. frozen storage: 7.7 month
Canada, 2005, Minto, MB (Common Rye Seed)	2 × 110	7	207 206	Hard dough	22	Grain	0.13 0.12 (0.13)	0.026 0.023 (0.025)	0.16 0.14 (0.15)	137720 2006/7006725 R05149 METCON_151 Max. frozen storage: 8.9 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 168 Residues of metabolites M11, M21 and M30 in rye grain following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
USA, 2005, Chula, GA (Wrens Abruzzi)	2 × 110	7	136 127	Soft dough	21	Grain	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137720 2006/7006725 R05145 METCON_151 Max. frozen storage: 12 month
USA, 2005, York, NE, (VNS Winter Rye)	2 × 110	7	188 188	Late milk	22	Grain	0.02 0.03 (0.025)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137720 2006/7006725 R05146 METCON_151 Max. frozen

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
USA, 2005, Eldridge, ND, (Dahcold)	1× 110 1× 120	6	143 149	Late milk	14	Grain	0.01 0.02 (0.015)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137720 2006/7006725 R05147 METCON_151 Max. frozen storage: 9.6 month
					21	Grain	0.04 0.04 (0.04)	< 0.01 < 0.01 (< 0.01)	< 0.01 0.01 (0.01)	
					28	Grain	0.04 0.04 (0.04)	< 0.01 < 0.01 (< 0.01)	0.01 0.01 (0.01)	
					34	Grain	0.06 0.06 (0.06)	0.01 0.01 (0.01)	0.01 0.01 (0.01)	
Canada, 2005, Rosthern, SK (Gazelle)	2 × 110	8	204 200	Soft dough	20	Grain	0.01 0.01 (0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137720 2006/7006725 R05148 METCON_151 Max. frozen storage: 7.7 month
Canada, 2005, Minto, MB (Common Rye Seed)	2 × 110	7	207 206	Hard dough	22	Grain	0.04 0.04 (0.04)	0.01 0.01 (0.01)	< 0.01 < 0.01 (< 0.01)	137720 2006/7006725 R05149 METCON_151 Max. frozen storage: 8.9 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] Residues of metabolites M11, M21 and M30 are expressed as parent equivalent (conversion factors 0.95, 0.95 and 0.96, respectively). For calculations, 0.01 mg/kg was used for residues below or at the LOQ for metabolites M11, M21 and M30.

Table 169 Residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), and triazolyl acetic acid (TAA) in rye grain following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] T	TA	TAA	Report/Trial No., Reference, Storage period
USA, 2005, Chula, GA (Wrens Abruzzi)	2 × 110	7	136 127	Soft dough	21	Grain	< 0.05 < 0.05 (< 0.05)	1.7 1.6 (1.7) Control: 1.8	1.3 1.1 (1.2) Control: 1.3	137720 2006/7006725 R05145 METCON_151 Max. frozen storage: 12 month
USA, 2005, York, NE, (VNS Winter Rye)	2 × 110	7	188 188	Late milk	22	Grain	< 0.05 < 0.05 (< 0.05)	0.15 0.12 (0.14) Control: 0.08	0.08 0.06 (0.07) Control: 0.06	137720 2006/7006725 R05146 METCON_151 Max. frozen storage: 10 month
USA, 2005, Eldridge, ND, (Dahcold)	1× 110 1× 120	6	143 149	Late milk	14	Grain	< 0.05 < 0.05 (< 0.05)	0.06 0.06 (0.06)	< 0.05 < 0.05 (< 0.05)	137720 2006/7006725 R05147 METCON_151 Max. frozen storage: 9.6
					21	Grain	< 0.05 < 0.05 (< 0.05)	0.07 0.07 (0.07)	< 0.05 < 0.05 (< 0.05)	

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] T	TA	TAA	Report/Trial No., Reference, Storage period
					28	Grain	< 0.05 < 0.05 (< 0.05)	0.07 0.07 (0.07)	< 0.05 < 0.05 (< 0.05)	month
					34	Grain	< 0.05 < 0.05 (< 0.05)	0.07 0.07 (0.07)	< 0.05 < 0.05 (< 0.05)	
Canada, 2005, Rosthern, SK (Gazelle)	2 × 110	8	204 200	Soft dough	20	Grain	< 0.05 < 0.05 (< 0.05)	0.08 0.08 (0.08)	< 0.05 < 0.05 (< 0.05)	137720 2006/7006725 R05148 METCON_151 Max. frozen storage: 7.7 month
Canada, 2005, Minto, MB (Common Rye Seed)	2 × 110	7	207 206	Hard dough	22	Grain	< 0.05 < 0.05 (< 0.05)	0.06 0.06 (0.06)	< 0.05 < 0.05 (< 0.05)	137720 2006/7006725 R05149 METCON_151 Max. frozen storage: 8.9 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Barley

A total of 12 field trials were conducted on barley in the Canada and the USA during the 2004-05 growing seasons (White & Saha, 2006, METCON_148). Plants received 2 foliar applications of metconazole at nominal rates of 112–123 g ai/ha. Barley grain was harvested at 20–21 days after the last application. Additional samples from a decline trial were collected at 14, 21, 28 and 35 days. Residues of cis- and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0508. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of <20%, except for triazole in grain spiked at 0.05 mg/kg which had a mean recovery of 125%.

Table 170 Residues of cis- and trans-metconazole in barley grain following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2005, North Rose, NY (Chapais)	2 × 120	8	231 230	71	20	Grain	0.19 0.17 (0.18)	0.03 0.03 (0.03)	0.23 0.20 (0.21)	137714 2006/7006917 RCN R05155 METCON_148 Max. frozen storage: 6.2 month
USA, 2005, Belleville, IL (Not stated)	1× 0.11 1× 0.12	7	117 157	69	14	Grain	1.5 1.1 (1.3)	0.362 0.164 (0.26)	2.0 1.2 (1.5)	137714 2006/7006917 RCN R05156 METCON_148 Max. frozen storage: 7.6 month
					21		1.2 0.8 (1.0)	0.18 0.13 (0.15)	1.4 0.9 (1.2)	
					28		0.8	0.136	0.94	

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
					35		0.62 (0.72) 0.56 0.61 (0.59)	0.091 (0.11) 0.086 0.095 (0.09)	0.72 (0.83) 0.65 0.70 (0.68)	
USA, 2005, York, NE, (Robust Barley)	2 × 0.11	7	185 186	58	21	Grain	0.17 0.14 (0.16)	0.04 0.03 (0.03)	0.21 0.17 (0.19)	137714 2006/7006917 RCN R05157 METCON_148 Max. frozen storage: 6.5 month
USA, 2005, Velva, ND (Excel)	2 × 0.11	7	113 111	69	20	Grain	0.14 0.15 (0.14)	0.03 0.03 (0.03)	0.16 0.17 (0.17)	137714 2006/7006917 RCN R05158 METCON_148 Max. frozen storage: 6.1 month
USA, 2005, Grand Island, NE (Robust Barley)	2 × 0.11	7	187 188	58	21	Grain	0.43 0.40 (0.42)	0.07 0.06 (0.06)	0.50 0.46 (0.48)	137714 2006/7006917 RCN R05159 METCON_148 Max. frozen storage: 6.5 month
USA, 2005, Young Ward, UT (Baroness)	2 × 0.12	8	161 160	87	20	Grain	0.49 0.47 (0.48)	0.09 0.10 (0.10)	0.58 0.57 (0.57)	137714 2006/7006917 RCN R05160 METCON_148 Max. frozen storage: 5.4 month
USA, 2005, Madera, CA, UT (Farmers Best)	2 × 0.11	7	280 279	87	21	Grain	0.88 1.3 (1.1)	0.20 0.27 (0.23)	1.1 1.6 (1.3)	137714 2006/7006917 RCN R05161 METCON_148 Max. frozen storage: 7.3 month
USA, 2005, Payette, ID (Baronesse)	1× 0.11 1×0.12	7	282 280	58	21	Grain	0.58 0.52 (0.55)	0.11 0.11 (0.11)	0.69 0.63 (0.66)	137714 2006/7006917 RCN R05162 METCON_148 Max. frozen storage: 5.8 month
Canada, 2005, Rosthern, SK (AC Metcalfe)	2 × 0.11	6	205 204	73	21	Grain	0.09 0.10 (0.10)	0.02 0.02 (0.02)	0.11 0.12 (0.12)	137714 2006/7006917 RCN R05163 METCON_148 Max. frozen storage: 4.9 month
Canada, 2005, Minto, MB (AC	2 × 0.11	8	207 195	75	20	Grain	0.27 0.19 (0.23)	0.04 0.03 (0.04)	0.31 0.23 (0.27)	137714 2006/7006917 RCN R05164

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
Metcalfe)										METCON_148 Max. frozen storage: 6.0 month
Canada, 2005, Innisfail, AB (CDC Bold)	2 × 0.11	7	226 233	61	21	Grain	0.48 0.46 (0.47)	0.10 0.10 (0.10)	0.58 0.56 (0.57)	137714 2006/7006917 RCN R05165 METCON_148 Max. frozen storage: 4.4 month
Canada, 2005, Innisfail, AB (CDC Bold)	2 × 0.11	7	202 226	57	21	Grain	0.40 0.40 (0.40)	0.08 0.07 (0.07)	0.48 0.47 (0.48)	137714 2006/7006917 RCN R05166 METCON_148 Max. frozen storage: 4.5 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 171 Residues of metabolites M11, M21 and M30 in barley grain following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
USA, 2005, North Rose, NY (Chapais)	2 × 0.12	8	231 230	71	20	Grain	0.120 0.120 (0.12)	0.010 0.010 (0.01)	0.040 0.030 (0.04)	137714 2006/7006917 RCN R05155 METCON_148 Max. frozen storage: 6.2 month
USA, 2005, Belleville, IL (Not stated)	1× 0.11 1× 0.12	7	117 157	69	14 21 28 35	Grain	0.40 0.29 (0.35) 0.30 0.33 (0.32) 0.25 0.19 (0.22) 0.18 0.28 (0.23)	0.10 0.07 (0.09) 0.08 0.06 (0.07) 0.06 0.05 (0.06) 0.04 0.05 (0.05)	0.060 0.05 (0.06) 0.05 0.04 (0.05) 0.04 0.04 (0.04) 0.03 0.04 (0.04)	137714 2006/7006917 RCN R05156 METCON_148 Max. frozen storage: 7.6 month
USA, 2005, York, NB, (Robust Barley)	2 × 0.11	7	185 186	58	21	Grain	0.03 0.03 (0.03)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006917 RCN R05157 METCON_148 Max. frozen storage: 6.5 month
USA, 2005, Velva,	2 × 0.11	7	113	69	20	Grain	0.02	< 0.01	< 0.01	137714 2006/7006917

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				M11	M21	M30	
ND (Excel)			111				0.02 (0.02)	< 0.01 (< 0.01)	< 0.01 (< 0.01)	RCN R05158 METCON_148 Max. frozen storage: 6.1 month
USA, 2005, Grand Island, NB (Robust Barley)	2 × 0.11	7	187 188	58	21	Grain	0.05 0.05 (0.05)	0.01 0.01 (0.01)	0.01 0.01 (0.01)	137714 2006/7006917 RCN R05159 METCON_148 Max. frozen storage: 6.5 month
USA, 2005, Young Ward, UT (Baroness)	2 × 0.12	8	161 160	87	20	Grain	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006917 RCN R05160 METCON_148 Max. frozen storage: 5.4 month
USA, 2005, Madera, CA, UT (Farmers Best)	2 × 0.11	7	280 279	87	21	Grain	0.01 0.01 (0.01)	0.01 0.02 (0.02)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006917 RCN R05161 METCON_148 Max. frozen storage: 7.3 month
USA, 2005, Payette, ID (Baronesse)	1× 0.11 1×0.12	7	282 280	58	21	Grain	< 0.01 < 0.01 <(0.01)	0.01 0.01 (0.01)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006917 RCN R05162 METCON_148 Max. frozen storage: 5.8 month
Canada, 2005, Rosthern, SK (AC Metcalfe)	2 × 0.11	6	205 204	73	21	Grain	0.01 0.02 (0.02)	0.01 < 0.01 (0.01)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006917 RCN R05163 METCON_148 Max. frozen storage: 4.9 month
Canada, 2005, Minto, MB (AC Metcalfe)	2 × 0.11	8	207 195	75	20	Grain	0.04 0.03 (0.04)	0.01 0.01 (0.01)	0.01 0.01 (0.01)	137714 2006/7006917 RCN R05164 METCON_148 Max. frozen storage: 6.0 month
Canada, 2005, Innisfail, AB (CDC Bold)	2 × 0.11	7	226 233	61	21	Grain	0.07 0.07 (0.07)	0.05 0.04 (0.05)	0.01 0.01 (0.01)	137714 2006/7006917 RCN R05165 METCON_148 Max. frozen storage: 4.4 month
Canada, 2005,	2 × 0.11	7	202	57	21	Grain	0.06	0.04	< 0.01	137714

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
Innisfail, AB (CDC Bold)			226				0.07 (0.07)	0.04 (0.04)	< 0.01 (< 0.01)	2006/7006917 RCN R05166 METCON_148 Max. frozen storage: 4.5 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] Residues of metabolites M11, M21 and M30 are expressed as parent equivalent (conversion factors 0.95, 0.95 and 0.96, respectively). For calculations, 0.01 mg/kg was used for residues below or at the LOQ for metabolites M11, M21 and M30.

Table 172 Residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), and triazolyl acetic acid (TAA) in barley grain following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] T	TA	TAA	Report/Trial No., Reference, Storage period
USA, 2005, North Rose, NY (Chapais)	2 × 0.12	8	231	71	20	Grain	< 0.05	0.090	0.180	137714
			230				< 0.05 (< 0.05)	0.080 (0.085) Control: 0.34	0.180 (0.180) Control: 0.14	2006/7006917 RCN R05155 METCON_148 Max. frozen storage: 6.2 month
USA, 2005, Belleville, IL (Not stated)	1× 0.11 1× 0.12	7	117	69	14	Grain	< 0.05	0.060	0.070	137714 2006/7006917 RCN R05156 METCON_148 Max. frozen storage: 7.6 month
			157				< 0.05	0.050	0.070	
							(< 0.05)	(0.055)	(0.070)	
					21		< 0.05	< 0.05	0.060	
							< 0.05	0.060	0.060	
							(< 0.05)	(0.055)	(0.060)	
					28		< 0.05	0.070	0.070	
							< 0.05	< 0.05	0.060	
							(< 0.05)	(0.060)	(0.065)	
					35		< 0.05	< 0.05	0.060	
							< 0.05	0.060	0.070	
							(< 0.05)	(0.055) Control: 0.06	(0.065) Control: 0.07	
USA, 2005, York, NB, (Robust Barley)	2 × 0.11	7	185	58	21	Grain	< 0.05	0.060	0.140	137714 2006/7006917 RCN R05157 METCON_148 Max. frozen storage: 6.5 month
			186				< 0.05 (< 0.50)	< 0.05 (0.055) Control: 0.11	0.120 (0.130)	
USA, 2005, Velva, ND (Excel)	2 × 0.11	7	113	69	20	Grain	< 0.05	< 0.05	0.100	137714 2006/7006917 RCN R05158 METCON_148 Max. frozen storage: 6.1 month
			111				< 0.05 (< 0.50)	< 0.05 (0.050) Control: 0.06	0.100 (0.100)	
USA, 2005, Grand Island, NB (Robust	2 × 0.11	7	187	58	21	Grain	< 0.05	< 0.05	0.090	137714 2006/7006917 RCN R05159 METCON_148
			188				< 0.05 (< 0.50)	< 0.05 (0.050)	0.080 (0.085)	

Location, Year (variety Barley)	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				T	TA	TAA	
								Control: 0.07		Max. frozen storage: 6.5 month
USA, 2005, Young Ward, UT (Baroness)	2 × 0.12	8	161 160	87	20	Grain	< 0.05 < 0.05 (< 0.50)	< 0.05 < 0.05 (0.050)	< 0.05 < 0.05 (0.050)	137714 2006/7006917 RCN R05160 METCON_148 Max. frozen storage: 5.4 month
USA, 2005, Madera, CA, UT (Farmers Best)	2 × 0.11	7	280 279	87	21	Grain	< 0.05 < 0.05 (< 0.50)	< 0.05 < 0.05 (0.050)	< 0.05 < 0.05 (0.050)	137714 2006/7006917 RCN R05161 METCON_148 Max. frozen storage: 7.3 month
USA, 2005, Payette, ID (Baronesse)	1× 0.11 1×0.12	7	282 280	58	21	Grain	< 0.05 < 0.05 (< 0.50)	< 0.05 < 0.05 (0.050)	< 0.05 < 0.05 (0.050)	137714 2006/7006917 RCN R05162 METCON_148 Max. frozen storage: 5.8 month
Canada, 2005, Rosthern, SK (AC Metcalfe)	2 × 0.11	6	205 204	73	21	Grain	< 0.05 < 0.05 (< 0.50)	< 0.05 < 0.05 (0.050)	< 0.05 0.050 (0.050)	137714 2006/7006917 RCN R05163 METCON_148 Max. frozen storage: 4.9 month
Canada, 2005, Minto, MB (AC Metcalfe)	2 × 0.11	8	207 195	75	20	Grain	< 0.05 < 0.05 (< 0.50)	0.180 0.180 (0.180) Control: 0.27	0.450 0.420 (0.435) Control: 0.11	137714 2006/7006917 RCN R05164 METCON_148 Max. frozen storage: 6.0 month
Canada, 2005, Innisfail, AB (CDC Bold)	2 × 0.11	7	226 233	61	21	Grain	< 0.05 < 0.05 (< 0.50)	< 0.05 < 0.05 (0.050) Control: 0.07	0.050 < 0.05 (0.050)	137714 2006/7006917 RCN R05165 METCON_148 Max. frozen storage: 4.4 month
Canada, 2005, Innisfail, AB (CDC Bold)	2 × 0.11	7	202 226	57	21	Grain	< 0.05 < 0.05 (< 0.50)	0.070 0.060 (0.065) Control: 0.43	0.310 0.320 (0.315) Control: 0.08	137714 2006/7006917 RCN R05166 METCON_148 Max. frozen storage: 4.5 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Oat

A total of 12 field trials were conducted on oat in the Canada and the USA during the 2004-05 growing seasons (Jordan & Saha, 2006, METCON_149). Plants received 2 foliar applications of metconazole at nominal rates of 112–123 g ai/ha. Oat grain was harvested at 20–21 days after the last application. Additional samples from a decline trial were collected at 14, 21, 28 and 36 days. Residues of cis- and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0508. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of <20%. However one recovery of the 1 mg/kg fortification level in grain for M11, M21 and M30 was >120% and therefore excluded from the calculation of the mean recovery.

Table 173 Residues of cis- and trans-metconazole in oat grain following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2005, North Rose, NY (AC Alymer)	2 × 0.11	8	227 233	83	20	Grain	0.31 0.30 (0.30)	0.049 0.048 (0.049)	0.36 0.35 (0.35)	137717 2006/7006724 RCN R05126 METCON_149 Max. frozen storage: 9.8 month
USA, 2005, Sunsweet, GA (Horizon 314)	2 × 0.11	7	131 136	85	21	Grain	0.49 0.43 (0.46)	0.069 0.060 (0.065)	0.56 0.49 (0.53)	137717 2006/7006724 RCN R05127 METCON_149 Max. frozen storage: 12 month
USA, 2005, Carlyle, IL, (Seed oats)	1× 0.12 1× 0.11	7	166 167	85	21	Grain	0.48 0.47 (0.48)	0.091 0.068 (0.080)	0.57 0.54 (0.56)	137717 2006/7006724 RCN R05128 METCON_149 Max. frozen storage: 11 month
USA, 2005, Arkansaw, WI, (Vista)	1× 0.12 1× 0.11	7	188 189	75	20	Grain	0.32 0.36 (0.34)	0.044 0.068 (0.056)	0.37 0.43 (0.40)	137717 2006/7006724 RCN R05129 METCON_149 Max. frozen storage: 9.7 month
USA, 2005, Eldridge, ND, (Morton)	2 × 0.11	7	186 142	75	21	Grain	0.10 0.12 (0.11)	0.024 0.027 (0.026)	0.13 0.15 (0.14)	137717 2006/7006724 RCN R05130 METCON_149 Max. frozen storage: 9.4 month
USA, 2004, Grand Island, NE (Jerry)	1× 0.12 1× 0.11	7	189 189	85	21	Grain	0.15 0.16 (0.16)	0.029 0.033 (0.031)	0.18 0.19 (0.19)	137717 2006/7006724 RCN R05131 METCON_149 Max. frozen storage: 10 month

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2005, Gardner, ND (Morton)	1× 0.12	6	149 149	75	14 21 28 36	Grain	0.15 0.17 (0.16) 0.12 0.11 (0.12) 0.18 0.15 (0.17) 0.16 0.11 (0.13)	0.032 0.034 (0.033) 0.027 0.029 (0.028) 0.039 0.034 (0.037) 0.031 0.025 (0.028)	0.18 0.21 (0.19) 0.14 0.14 (0.14) 0.22 0.19 (0.21) 0.19 0.14 (0.16)	137717 2006/7006724 RCN R05132 METCON_149 Max. frozen storage: 9.2 month
USA, 2005, Hinton, OK (Jerry)	2 × 0.11	7	126 132	77	26	Grain	0.28 0.22 (0.25)	0.070 0.050 (0.060)	0.35 0.27 (0.31)	137717 2006/7006724 RCN R05133 METCON_149 Max. frozen storage: 11 month
Canada, 2005, St-Cesaire, SK (Rigodon)	1× 0.12 1× 0.11	7	202 228	87	21	Grain	0.34 0.57 (0.45)	0.092 0.11 (0.10)	0.43 0.68 (0.56)	137717 2006/7006724 RCN R05134 METCON_149 Max. frozen storage: 8.3 month
Canada, 2005, Rosthern, SK (Furlong)	2 × 0.11	8	204 200	83	20	Grain	0.18 0.14 (0.16)	0.036 0.028 (0.032)	0.22 0.17 (0.19)	137717 2006/7006724 RCN R05135 METCON_149 Max. frozen storage: 7.6 month
Canada, 2005, Minto, MB (Triple Crown)	2 × 0.11	7	208 199	87	20	Grain	0.041 0.19 (0.12)	0.22 0.050 (0.13)	0.26 0.24 (0.25)	137717 2006/7006724 RCN R05136 METCON_149 Max. frozen storage: 8.2 month
Canada, 2005, Innisfail, AB (AC Lu)	2 × 0.11	7	226 234	85	21	Grain	0.23 0.20 (0.22)	0.042 0.042 (0.042)	0.28 0.24 (0.26)	137717 2006/7006724 RCN R05137 METCON_149 Max. frozen storage: 7.4 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 174 Residues of metabolites M11, M21 and M30 in oat grain following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
USA, 2005, North Rose, NY (AC Alymer)	2 × 0.11	8	227 233	83	20	Grain	0.15 0.17 (0.16)	0.040 0.040 (0.040)	0.020 0.030 (0.025)	137717 2006/7006724 RCN R05126 METCON_149 Max. frozen storage: 9.8 month
USA, 2005, Sunsweet, GA (Horizon 314)	2 × 0.11	7	131 136	85	21	Grain	0.08 0.07 (0.075)	0.030 0.020 (0.025)	0.010 0.010 (0.010)	137717 2006/7006724 RCN R05127 METCON_149 Max. frozen storage: 12 month
USA, 2005, Carlyle, IL, (Seed oats)	1× 0.12 1× 0.11	7	166 167	85	21	Grain	0.16 0.16 (0.16)	0.040 0.030 (0.035)	0.020 0.020 (0.020)	137717 2006/7006724 RCN R05128 METCON_149 Max. frozen storage: 11 month
USA, 2005, Arkansaw, WI, (Vista)	1× 0.12 1× 0.11	7	188 189	75	20	Grain	0.20 0.24 (0.22)	0.030 0.040 (0.035)	0.040 0.050 (0.045)	137717 2006/7006724 RCN R05129 METCON_149 Max. frozen storage: 9.7 month
USA, 2005, Eldridge, ND, (Morton)	2 × 0.11	7	186 142	75	21	Grain	0.010 0.020 (0.015)	0.020 0.020 (0.020)	< 0.01 < 0.01 (< 0.01)	137717 2006/7006724 RCN R05130 METCON_149 Max. frozen storage: 9.4 month
USA, 2004, Grand Island, NE (Jerry)	1× 0.12 1× 0.11	7	189 189	85	21	Grain	0.030 0.030 (0.030)	0.020 0.020 (0.020)	< 0.01 < 0.01 (< 0.01)	137717 2006/7006724 RCN R05131 METCON_149 Max. frozen storage: 10 month
USA, 2005, Gardner, ND (Morton)	1× 0.12	6	149 149	75	14 21 28 36	Grain	0.010 0.020 (0.015) 0.020 0.020 (0.020) 0.070 0.040 (0.055) 0.080 0.070 (0.075)	0.020 0.020 (0.020) 0.020 0.020 (0.020) 0.030 0.020 (0.025) 0.030 0.030 (0.030)	< 0.01 < 0.01 (< 0.010) < 0.01 < 0.01 (< 0.010) 0.010 < 0.01 (0.010) 0.020 0.020 (0.020)	137717 2006/7006724 RCN R05132 METCON_149 Max. frozen storage: 9.2 month
USA, 2005, Hinton,	2 × 0.11	7	126	77	26	Grain	0.20	0.060	0.040	137717 2006/7006724

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
OK (Jerry)			132				0.16 (0.18)	0.050 (0.055)	0.030 (0.035)	RCN R05133 METCON_149 Max. frozen storage: 11 month
Canada, 2005, St-Cesaire, SK (Rigodon)	1× 0.12 1× 0.11	7	202 228	87	21	Grain	0.19 0.34 (0.27)	0.050 0.060 (0.060)	0.040 0.060 (0.050)	137717 2006/7006724 RCN R05134 METCON_149 Max. frozen storage: 8.3 month
Canada, 2005, Rosthern, SK (Furlong)	2 × 0.11	8	204 200	83	20	Grain	0.020 0.020 (0.020)	0.020 0.020 (0.020)	< 0.01 < 0.01 (< 0.01)	137717 2006/7006724 RCN R05135 METCON_149 Max. frozen storage: 7.6 month
Canada, 2005, Minto, MB (Triple Crown)	2 × 0.11	7	208 199	87	20	Grain	0.090 0.10 (0.095)	0.020 0.030 (0.025)	0.010 0.020 (0.015)	137717 2006/7006724 RCN R05136 METCON_149 Max. frozen storage: 8.2 month
Canada, 2005, Innisfail, AB (AC Lu)	2 × 0.11	7	226 234	85	21	Grain	0.020 0.020 (0.020)	0.020 0.020 (0.020)	< 0.01 < 0.01 (< 0.01)	137717 2006/7006724 RCN R05137 METCON_149 Max. frozen storage: 7.4 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] Residues of metabolites M11, M21 and M30 are expressed as parent equivalent (conversion factors 0.95, 0.95 and 0.96, respectively). For calculations, 0.01 mg/kg was used for residues below or at the LOQ for metabolites M11, M21 and M30.

Table 175 Residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), and triazolyl acetic acid (TAA) in oat grain following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg][a] T	TA	TAA	Report/Trial No., Reference, Storage period
USA, 2005, North Rose, NY (AC Alymer)	2 × 0.11	8	227 233	83	20	Grain	< 0.05 < 0.05 (< 0.05)	0.48 0.51 (0.50) Control: 0.51	0.16 0.18 (0.17) Control: 0.20	137717 2006/7006724 RCN R05126 METCON_149 Max. frozen storage: 9.8 month
USA, 2005, Sunsweet, GA (Horizon 314)	2 × 0.11	7	131 136	85	21	Grain	< 0.05 < 0.05 (< 0.05)	1.1 1.1 (1.1) Control: 0.76	0.38 0.40 (0.39) Control: 0.30	137717 2006/7006724 RCN R05127 METCON_149 Max. frozen storage: 12 month

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg][a] T	TA	TAA	Report/Trial No., Reference, Storage period
USA, 2005, Carlyle, IL, (Seed oats)	1× 0.12 1× 0.11	7	166 167	85	21	Grain	< 0.05 < 0.05 (< 0.05)	0.25 0.26 (0.26) Control: 0.18	0.070 0.080 (0.075) Control: 0.08	137717 2006/7006724 RCN R05128 METCON_149 Max. frozen storage: 11 month
USA, 2005, Arkansaw, WI, (Vista)	1× 0.12 1× 0.11	7	188 189	75	20	Grain	< 0.05 < 0.05 (< 0.05)	0.090 0.080 (0.085) Control: 0.12	< 0.05 < 0.05 (< 0.05) Control: 0.06	137717 2006/7006724 RCN R05129 METCON_149 Max. frozen storage: 9.7 month
USA, 2005, Eldridge, ND, (Morton)	2 × 0.11	7	186 142	75	21	Grain	< 0.05 < 0.05 (< 0.05)	0.14 0.16 (0.15) Control: 0.17	< 0.05 < 0.05 (< 0.05) Control: 0.08	137717 2006/7006724 RCN R05130 METCON_149 Max. frozen storage: 9.4 month
USA, 2004, Grand Island, NE (Jerry)	1× 0.12 1× 0.11	7	189 189	85	21	Grain	< 0.05 < 0.05 (< 0.05)	0.16 0.15 (0.16) Control: 0.09	0.050 < 0.05 (0.05)	137717 2006/7006724 RCN R05131 METCON_149 Max. frozen storage: 10 month
USA, 2005, Gardner, ND (Morton)	1× 0.12	6	149 149	75	14 21 28 36	Grain	< 0.05 < 0.05 (< 0.05) 0.080 0.060 (0.070) 0.050 0.060 (0.055) 0.050 0.070 (0.060) Control: 0.06	0.15 0.17 (0.16) 0.16 0.17 (0.17) 0.15 0.16 (0.16) 0.14 0.13 (0.14) Control: 0.07	< 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05)	137717 2006/7006724 RCN R05132 METCON_149 Max. frozen storage: 9.2 month
USA, 2005, Hinton, OK (Jerry)	2 × 0.11	7	126 132	77	26	Grain	< 0.05 < 0.05 (< 0.05)	1.1 1.2 (1.1) Control: 0.55	0.34 0.36 (0.35) Control: 0.20	137717 2006/7006724 RCN R05133 METCON_149 Max. frozen storage: 11 month
Canada, 2005, St-Cesaire, SK (Rigodon)	1× 0.12 1× 0.11	7	202 228	87	21	Grain	< 0.05 < 0.05 (< 0.05) Control: 0.05	0.12 0.10 (0.11)	< 0.05 < 0.05 (< 0.05)	137717 2006/7006724 RCN R05134 METCON_149 Max. frozen storage: 8.3 month

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg][a] T	TA	TAA	Report/Trial No., Reference, Storage period
Canada, 2005, Rosthern, SK (Furlong)	2 × 0.11	8	204 200	83	20	Grain	< 0.05 < 0.05 (< 0.05)	0.09 0.10 (0.10)	< 0.05 < 0.05 (< 0.05)	137717 2006/7006724 RCN R05135 METCON_149 Max. frozen storage: 7.6 month
Canada, 2005, Minto, MB (Triple Crown)	2 × 0.11	7	208 199	87	20	Grain	< 0.05 < 0.05 (< 0.05)	1.1 0.98 (1.1) Control: 0.58	0.40 0.37 (0.39) Control: 0.26	137717 2006/7006724 RCN R05136 METCON_149 Max. frozen storage: 8.2 month
Canada, 2005, Innisfail, AB (AC Lu)	2 × 0.11	7	226 234	85	21	Grain	< 0.05 < 0.05 (< 0.05)	0.06 0.06 (0.060) Control: 0.07	< 0.05 < 0.05 (< 0.05)	137717 2006/7006724 RCN R05137 METCON_149 Max. frozen storage: 7.4 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Maize

A total of 20 field trials were conducted on maize in the USA during the 2006 growing season (Carringer, 2006, METCON_150). Plants received 4 foliar applications of metconazole at nominal rates of 110 g ai/ha. Maize grain was harvested at 20–22 days after the last application. Residues of cis- and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0604. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.01 mg/kg or 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of <20%.

Residues of metabolites M11, M21 and M30, were each below their LOQ of 0.01 mg/kg in all trials.

Table 176 Residues of *cis*- and *trans*-metconazole in maize grain following foliar treatment (cGAP USA: 4×92 g ai/ha; 7 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2006, Germansville, PA (TA5750)	4× 110	7	290 290 281 290	87	21	Grain	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06426 METCON_150 Max. frozen storage: 2.3 month
USA, 2006, Seven Springs, NC (Garst 8377)	4× 110	7	271 271 271 271	87	21	Grain	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06427 METCON_150 Max. frozen

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
										storage: 3.0 month
USA, 2006, New Holland, OH (Crows 7R154)	4× 110	6–9	196 196 206 196	87	20	Grain	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06429 METCON_150 Max. frozen storage: 1.8 month
USA, 2006, Atlanta, OH (Crows 5151)	4× 110	6–9	150 150 150 150	87	20	Grain	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06430 METCON_150 Max. frozen storage: 1.8 month
USA, 2006, Carlyle, IL, (BT 6516 RR 2YG)	4× 110	7	131 215 224 178	R6	21	Grain	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06431 METCON_150 Max. frozen storage: 2.1 month
USA, 2006, Mason, IL, (Burrus 664 RWR-PX4)	4× 110	6–8	159 140 159 159	87–89	21	Grain	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06432 METCON_150 Max. frozen storage: 2.3 month
USA, 2006, Wyoming, IL, (Burrus 644 RWR)	4× 110	6–7	159 159 159 150	R5	22	Grain	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06433 METCON_150 Max. frozen storage: 2.0 month
USA, 2006, Danville, IN (Wyffels W5531)	4× 110	7	140 140 150 159	87–89	21	Grain	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06434 METCON_150 Max. frozen storage: 2.5 month
USA, 2006, Bellmore, IN (Wyffels W5531)	4× 110	6–8	159 159 159 159	87	21	Grain	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06435 METCON_150 Max. frozen storage: 1.7 month
USA, 2006, Richland, IO (Golden Harvest HX 9323)	4× 110	7	150 150 150 178	R5	21	Grain	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06436 METCON_150 Max. frozen

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
										storage: 2.1 month
USA, 2006, Hedrick, IO (Pioneer 34A16)	4× 110	7–8	159 159 159 140	R5	21	Grain	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06437 METCON_150 Max. frozen storage: 2.5 month
USA, 2006, Ollie, IO (Middlekoop 2212)	4× 110	7	159 150 159 178	R5	21	Grain	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06438 METCON_150 Max. frozen storage: 2.1 month
USA, 2006, Bagley, IO (33P65)	4× 110	7	206 206 224 215	85	21	Grain	0.013 0.006 (0.095)	< 0.005 < 0.005 (< 0.005)	0.018 0.011 (0.015)	254314 2006/7012839 RCN R06439 METCON_150 Max. frozen storage: 2.6 month
USA, 2006 Delavan, WI (DKC52–40 (RR2/YGPL))	4× 110	6–7	159 159 168 159	R5	21	Grain	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06440 METCON_150 Max. frozen storage: 2.3 month
USA, 2006 Ellendale, MN (Pioneer 38H66)	4× 110	6–7	159 150 168 159	R5/R6	21	Grain	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06441 METCON_150 Max. frozen storage: 1.9 month
USA, 2006 Geneva, MN (Pioneer 38H66)	4× 110	6–7	159 159 168 159	R5/R6	21	Grain	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06442 METCON_150 Max. frozen storage: 1.9 month
USA, 2006 York, NE (Pioneer 34N45 RR/YG)	4× 110	6–7	187 187 187 187	87	21	Grain	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06443 METCON_150 Max. frozen storage: 2.7 month
USA, 2006, Grand Island,	4× 110	7	178	87	21	Grain	< 0.005	< 0.005	< 0.01	254314

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
NE (NK N73-F7 RR/LL/YG)			187 187 187				< 0.005 (< 0.005)	< 0.005 (< 0.005)	< 0.01 (< 0.01)	2006/7012839 RCN R06444 METCON_150 Max. frozen storage: 2.7 month
USA, 2006, Osceola, NE (NK N73-F7)	4× 110	6–8	187 187 187 187	87	21	Grain	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06445 METCON_150 Max. frozen storage: 2.6 month
USA, 2006, Dill, OK (DK C48–53 AF2)	4× 110	6–9	196 206 196 196	87	21	Grain	0.005 < 0.005 (0.005)	< 0.005 < 0.005 (< 0.005)	0.01 < 0.01 (0.01)	254314 2006/7012839 RCN R06446 METCON_150 Max. frozen storage: 2.5 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 177 Residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), and triazolyl acetic acid (TAA) in maize grain following foliar treatment (cGAP USA: 4×92 g ai/ha; 7 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] T	TA	TAA	Report/Trial No., Reference, Storage period
USA, 2006, Germansville, PA (TA5750)	4× 110	7	290 290 281 290	87	21	Grain	< 0.01 < 0.01 (< 0.01)	0.11 0.10 (0.11)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06426 METCON_150 Max. frozen storage: 2.3 month
USA, 2006, Seven Springs, NC (Garst 8377)	4× 110	7	271 271 271 271	87	21	Grain	< 0.01 < 0.01 (< 0.01)	0.07 0.07 (0.07) Control: 0.07	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06427 METCON_150 Max. frozen storage: 3.0 month
USA, 2006, New Holland, OH (Crows 7R154)	4× 110	6–9	196 196 206 196	87	20	Grain	< 0.01 < 0.01 (< 0.01)	< 0.05 < 0.05 (< 0.05)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06429 METCON_150 Max. frozen storage: 1.8 month
USA, 2006, Atlanta, OH (Crows 5151)	4× 110	6–9	150 150 150 150	87	20	Grain	< 0.01 < 0.01 (< 0.01)	0.07 0.05 (0.06)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06430 METCON_150 Max. frozen storage: 1.8 month
USA, 2006,	4× 110	7	131	R6	21	Grain	< 0.01	< 0.05	< 0.01	254314

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				T	TA	TAA	
Carlyle, IL, (BT 6516 RR 2YG)			215 224 178				< 0.01 (< 0.01)	< 0.05 (< 0.05) Control: 0.06	< 0.01 (< 0.01)	2006/7012839 RCN R06431 METCON_150 Max. frozen storage: 2.1 month
USA, 2006, Mason, IL, (Burrus 664 RWR-PX4)	4× 110	6–8	159 140 159 159	87–89	21	Grain	< 0.01 < 0.01 (< 0.01)	0.10 0.10 (0.10) Control: 0.05	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06432 METCON_150 Max. frozen storage: 2.3 month
USA, 2006, Wyoming, IL, (Burrus 644 RWR)	4× 110	6–7	159 159 159 150	R5	22	Grain	< 0.01 < 0.01 (< 0.01)	0.08 0.09 (0.09)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06433 METCON_150 Max. frozen storage: 2.0 month
USA, 2006, Danville, IN (Wyffels W5531)	4× 110	7	140 140 150 159	87–89	21	Grain	< 0.01 < 0.01 (< 0.01)	0.10 0.09 (0.10)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06434 METCON_150 Max. frozen storage: 2.5 month
USA, 2006, Bellmore, IN (Wyffels W5531)	4× 110	6–8	159 159 159 159	87	21	Grain	< 0.01 < 0.01 (< 0.01)	0.07 0.12 (0.095)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06435 METCON_150 Max. frozen storage: 1.7 month
USA, 2006, Richland, IO (Golden Harvest HX 9323)	4× 110	7	150 150 150 178	R5	21	Grain	< 0.01 < 0.01 (< 0.01)	0.05 < 0.05 (0.05) Control: 0.06	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06436 METCON_150 Max. frozen storage: 2.1 month
USA, 2006, Hedrick, IO (Pioneer 34A16)	4× 110	7–8	159 159 159 140	R5	21	Grain	< 0.01 < 0.01 (< 0.01)	0.10 0.13 (0.12) Control: 0.10	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06437 METCON_150 Max. frozen storage: 2.5 month
USA, 2006, Ollie, IO (Middlekoop 2212)	4× 110	7	159 150 159 178	R5	21	Grain	< 0.01 < 0.01 (< 0.01)	0.09 0.09 (0.09)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06438 METCON_150 Max. frozen storage: 2.1 month
USA, 2006, Bagley, IO (33P65)	4× 110	7	206 206 224 215	85	21	Grain	< 0.01 < 0.01 (< 0.01)	< 0.05 < 0.05 (< 0.05) Control: 0.06	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06439 METCON_150 Max. frozen

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				T	TA	TAA	
										storage: 2.6 month
USA, 2006 Delavan, WI (DKC52–40 (RR2/YGPL))	4× 110	6–7	159 159 168 159	R5	21	Grain	< 0.01 < 0.01 (< 0.01)	0.06 0.06 (0.06) Control: 0.06	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06440 METCON_150 Max. frozen storage: 2.3 month
USA, 2006 Ellendale, MN (Pioneer 38H66)	4× 110	6–7	159 150 168 159	R5/R6	21	Grain	< 0.01 < 0.01 (< 0.01)	< 0.05 < 0.05 (< 0.05)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06441 METCON_150 Max. frozen storage: 1.9 month
USA, 2006 Geneva, MN (Pioneer 38H66)	4× 110	6–7	159 159 168 159	R5/R6	21	Grain	< 0.01 < 0.01 (< 0.01)	0.09 0.10 (0.10) Control: 0.06	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06442 METCON_150 Max. frozen storage: 1.9 month
USA, 2006 York, NE (Pioneer 34N45 RR/YG)	4× 110	6–7	187 187 187 187	87	21	Grain	< 0.01 < 0.01 (< 0.01)	0.08 0.08 (0.08) Control: 0.07	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06443 METCON_150 Max. frozen storage: 2.7 month
USA, 2006, Grand Island, NE (NK N73-F7 RR/LL/YG)	4× 110	7	178 187 187 187	87	21	Grain	< 0.01 < 0.01 (< 0.01)	0.09 0.09 (0.09) Control: 0.06	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06444 METCON_150 Max. frozen storage: 2.7 month
USA, 2006, Osceola, NE (NK N73-F7)	4× 110	6–8	187 187 187 187	87	21	Grain	< 0.01 < 0.01 (< 0.01)	0.22 0.20 (0.21)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06445 METCON_150 Max. frozen storage: 2.6 month
USA, 2006, Dill, OK (DK C48–53 AF2)	4× 110	6–9	196 206 196 196	87	21	Grain	< 0.01 < 0.01 (< 0.01)	0.06 < 0.05 (0.06) Control: 0.06	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06446 METCON_150 Max. frozen storage: 2.5 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Sweet corn (Corn-on −the-cob)

A total of 12 field trials were conducted on sweet corn in the USA during the 2006 growing season (Carringer, 2006, METCON_150). Plants received 4 foliar applications of metconazole at nominal rates of 110 g ai/ha. Sweet corn was harvested at 6–7 days after the last application. Residues of cis-

and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0604. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.01 mg/kg or 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of <20%.

Residues of metabolites M11, M21 and M30, were each below their LOQ of 0.01 mg/kg in all trials.

Table 178 Residues of *cis*- and *trans*-metconazole in sweet corn following foliar treatment (cGAP USA: 4×92 g ai/ha; 7 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2006, South Sodus, NY (Speedy sweet)	4× 110	6–8	290 281 281 281	59–71	7	Kernels plus cob with husk removed	< 0.005 0.006 (0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 0.011 (0.010)	254314 2006/7012839 RCN R06425 METCON_150 Max. frozen storage: 3.2 month
USA, 2006, Germansville, PA (TA5750)	4× 110	6–7	290 290 281 290	Milk stage	7	Kernels plus cob with husk removed	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06426 METCON_150 Max. frozen storage: 3.7 month
USA, 2006, Seven Springs, NC (Garst 8377)	4× 110	6–8	150 159 196 281	67	7	Kernels plus cob with husk removed	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06427 METCON_150 Max. frozen storage: 5.7 month
USA, 2006, O'Brien, FL (8102 R Bicolor)	4× 110	7	215 224 224 234	75	7	Kernels plus cob with husk removed	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06428 METCON_150 Max. frozen storage: 1.9 month
USA, 2006, New Holland, OH (Crows 7R154)	4× 110	6–7	196 196 196 206	73	7	Kernels plus cob with husk removed	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06429 METCON_150 Max. frozen storage: 4.0 month
USA, 2006, Wyoming, IL, (Burrus 644 RWR)	4× 110	6–8	131 131 131 150	R3	6	Kernels plus cob with husk removed	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06433 METCON_150 Max. frozen storage: 3.8 month
USA, 2006, Bellmore, IN (Wyffels W5531)	4× 110	7	178 159 168 150	71–73	7	Kernels plus cob with husk removed	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06435 METCON_150 Max. frozen storage: 3.7 month
USA, 2006,	4× 110	7–8	159	R4	7	Kernels	< 0.005	< 0.005	< 0.01	254314

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
Ollie, IA (Middlekoop 2212)			122 131 168			plus cob with husk removed	< 0.005 (< 0.005)	< 0.005 (< 0.005)	< 0.01 (< 0.01)	2006/7012839 RCN R06438 METCON_150 Max. frozen storage: 4.0 month
USA, 2006 Delavan, WI (DKC52–40 (RR2/YGPL))	4× 110	5–7	178 168 168 159	R3	7	Kernels plus cob with husk removed	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06440 METCON_150 Max. frozen storage: 3.5 month
USA, 2006, Porterville, CA (Bodacious)	4× 110	7–8	290 290 290 290	78	7	Kernels plus cob with husk removed	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06447 METCON_150 Max. frozen storage: 4.6 month
USA, 2006, Ephrata, WA (Golden Jubilee)	4× 110	7	140 140 140 140	73	7	Kernels plus cob with husk removed	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06448 METCON_150 Max. frozen storage: 4.0 month
USA, 2006, Corvallis, OR (Super Sweet Jubilee Plus)	4× 110	7	122 122 122 122	73	7	Kernels plus cob with husk removed	< 0.005 < 0.005 (< 0.005)	< 0.005 < 0.005 (< 0.005)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06449 METCON_150 Max. frozen storage: 3.5 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 179 Residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), and triazolyl acetic acid (TAA) in sweet corn following foliar treatment (cGAP USA: 4×92 g ai/ha; 7 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] T	TA	TAA	Report/Trial No., Reference, Storage period
USA, 2006, South Sodus, NY (Speedy sweet)	4× 110	6–8	290 281 281 281	59–71	7	Kernels plus cob with husk removed	< 0.01 < 0.01 (< 0.01)	0.15 0.15 (0.15) Control: 0.10, 0.11	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06425 METCON_150 Max. frozen storage: 3.2 month
USA, 2006, Germansville, PA (TA5750)	4× 110	6–7	290 290 281 290	Milk stage	7 7	Kernels plus cob with husk removed	< 0.01 < 0.01 (< 0.01)	0.06 0.06 (0.06)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06426 METCON_150 Max. frozen storage: 3.7 month
USA, 2006, Seven	4× 110	6–8	150 159	67	7	Kernels plus cob	< 0.01 < 0.01	0.05 0.06	< 0.01 < 0.01	254314 2006/7012839

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] T	TA	TAA	Report/Trial No., Reference, Storage period
Springs, NC (Garst 8377)			196 281			with husk removed	(< 0.01)	(0.06)	(< 0.01)	RCN R06427 METCON_150 Max. frozen storage: 5.7 month
USA, 2006, O'Brien, FL (8102 R Bicolor)	4× 110	7	215 224 224 234	75	7	Kernels plus cob with husk removed	< 0.01 < 0.01 (< 0.01)	0.30 0.31 (0.31) Control: 0.19	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06428 METCON_150 Max. frozen storage: 1.9 month
USA, 2006, New Holland, OH (Crows 7R154)	4× 110	6–7	196 196 196 206	73	7	Kernels plus cob with husk removed	< 0.01 < 0.01 (< 0.01)!	0.08 0.08 (0.08)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06429 METCON_150 Max. frozen storage: 4.0 month
USA, 2006, Wyoming, IL, (Burrus 644 RWR)	4× 110	6–8	131 131 131 150	R3	6	Kernels plus cob with husk removed	< 0.01 < 0.01 (< 0.01)	0.10 0.10 (0.10)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06433 METCON_150 Max. frozen storage: 3.8 month
USA, 2006, Bellmore, IN (Wyffels W5531)	4× 110	7	178 159 168 150	71–73	7	Kernels plus cob with husk removed	< 0.01 < 0.01 (< 0.01)	0.16 0.15 (0.16)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06435 METCON_150 Max. frozen storage: 3.7 month
USA, 2006, Ollie, IA (Middlekoop 2212)	4× 110	7–8	159 122 131 168	R4	7	Kernels plus cob with husk removed	< 0.01 < 0.01 (< 0.01)	0.09 0.12 (0.11)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06438 METCON_150 Max. frozen storage: 4.0 month
USA, 2006 Delavan, WI (DKC52–40 (RR2/YGPL))	4× 110	5–7	178 168 168 159	R3	7	Kernels plus cob with husk removed	< 0.01 < 0.01 (< 0.01)	< 0.05 < 0.05 (< 0.05)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06440 METCON_150 Max. frozen storage: 3.5 month
USA, 2006, Porterville, CA (Bodacious)	4× 110	7–8	290 290 290 290	78	7	Kernels plus cob with husk removed	< 0.01 < 0.01 (< 0.01)	0.08 0.07 (0.08)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06447 METCON_150 Max. frozen storage: 4.6 month
USA, 2006, Ephrata, WA (Golden Jubilee)	4× 110	7	140 140 140 140	73	7	Kernels plus cob with husk removed	< 0.01 < 0.01 (< 0.01)	0.06 0.06 (0.06)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06448 METCON_150 Max. frozen storage: 4.0 month

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] T	TA	TAA	Report/Trial No., Reference, Storage period
USA, 2006, Corvallis, OR (Super Sweet Jubilee Plus)	4× 110	7	122 122 122 122	73	7	Kernels plus cob with husk removed	< 0.01 < 0.01 (< 0.01)	0.17 0.21 (0.19) Control: 0.20	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06449 METCON_150 Max. frozen storage: 3.5 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Grasses for sugar or syrup production

Sugar cane

A total of eight field trials were conducted on sugar cane in the USA during the 2008 growing seasons (White, 2013, METCON_153). Plants received 4 foliar applications of metconazole at nominal rates of 92 g ai/ha. Two trial also received an exaggerated rate of 4 times 460 g ai/ha. Sugar cane samples were harvested at 13–14 and 27–28 days after the last application. Residues of cis- and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0604. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30, 1,2,4-triazole and triazolyl acetic acid was at 0.01 mg/kg, and for metabolites triazolyl alanine at 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of < 20.

Residues of metabolites M11, M21, M30, 1,2,4-triazole, triazolyl alanine and triazolyl acetic acid were each below their respective LOQs of 0.01 or 0.05 mg/kg in all trials.

Table 180 Residues of *cis*- and *trans*-metconazole in sugar cane following foliar treatment (cGAP USA: 4 × 91 g ai/ha; 14 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2008, Belle Glade, FL (CP88–1762)	4×100	14	221 213 207 210	Bloom	14 28	Cane Cane	0.017 0.014 (0.015) 0.016	< 0.005 < 0.005 (< 0.005) 0.005	0.022 0.019 (0.020) 0.021	09901 2013/7001632 08-FL30 METCON_153
							0.013 (0.015)	0.005 (< 0.005)	0.018 (0.020)	Max. frozen storage: 26 months
USA, 2008, Belle Glade, FL (CP96–1252)	4×100	14	217 208 208 213	Bloom	14 28	Cane Cane	< 0.005 < 0.005 (< 0.005) < 0.005	< 0.005 < 0.005 (< 0.005) < 0.005	< 0.01 < 0.01 (< 0.01) < 0.01	09901 2013/7001632 08-FL31 METCON_153
							< 0.005 (< 0.005)	< 0.005 (< 0.005)	< 0.01 (< 0.01)	Max. frozen storage: 26 months
USA, 2008, Belle Glade, FL (CP89–2143)	4×100	14	205 206 207 208	Bloom	14 28	Cane Cane	< 0.005 < 0.005 (< 0.005) < 0.005	< 0.005 < 0.005 (< 0.005) < 0.005	< 0.01 < 0.01 (< 0.01) < 0.01	09901 2013/7001632 08-FL32 METCON_153
							< 0.005 (< 0.005)	< 0.005 (< 0.005)	< 0.01 (< 0.01)	Max. frozen storage: 26 months
	4×500	14	205 205 206 207	Bloom	14 28	Cane Cane	0.013 0.012 (0.013) 0.0061	< 0.005 < 0.005 (< 0.005) < 0.005	0.018 0.017 (0.018) 0.011	
							0.0062 (0.0062)	< 0.005 (< 0.005)	0.011 (0.011)	

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2008, St. Gabriel, LA (HoCP96–540)	4×100	14	182	Vegetative	13	Cane	0.030	0.005	0.035	09901
			164				0.030	0.005	0.036	2013/7001632
			157				(0.030)	(0.005)	(0.036)	08-TX20
			156		27	Cane	0.013	< 0.005	0.018	METCON_153
							0.015	< 0.005	0.020	Max. frozen
							(0.014)	(< 0.005)	(0.019)	storage: 18 months
USA, 2008, St. Gabriel, LA (HoCP95–988)	4×100	14	254	Vegetative	13	Cane	0.016	< 0.005	0.021	09901
			175				0.016	< 0.005	0.021	2013/7001632
			171				(0.016)	(< 0.005)	(0.021)	08-TX21
			167		27	Cane	0.0055	< 0.005	0.011	METCON_153
							0.012	< 0.005	0.017	Max. frozen
							(0.0086)	(< 0.005)	(0.014)	storage: 18 months
USA, 2008, St. Gabriel, LA (HoCP00–950)	4×100	14	168	Vegetative	13	Cane	0.012	< 0.005	0.017	09901
			163				0.016	< 0.005	0.021	2013/7001632
			145				(0.014)	(< 0.005)	(0.019)	08-TX22
			160		27	Cane	0.011	< 0.005	0.016	METCON_153
							0.011	< 0.005	0.016	Max. frozen
							(0.011)	(< 0.005)	(0.016)	storage: 18 months
USA, 2008, St. Gabriel, LA (L97–128)	4×100	14	167	Vegetative	13	Cane	0.023	< 0.005	0.028	09901
			162				0.027	< 0.005	0.032	2013/7001632
			168				(0.025)	(0.005)	(0.030)	08-TX23
			177		27	Cane	0.013	< 0.005	0.018	METCON_153
							0.017	< 0.005	0.022	Max. frozen
							(0.015)	(< 0.005)	(0.020)	storage: 18 months
USA, 2008, Weslaco, TX (TCP87–3388)	4×100	14	206	Vegetative	14	Cane	0.023	< 0.005	0.028	09901
			209				0.012	< 0.005	0.017	2013/7001632
			204				(0.018)	(< 0.005)	(0.023)	08-TX24
			205		28	Cane	0.011	< 0.005	0.016	METCON_153
							0.012	< 0.005	0.017	Max. frozen
							(0.011)	(< 0.005)	(0.016)	storage: 18 months
	4×510	13	203	Vegetative	13	Cane	0.12	0.022	0.14	
			208				0.093	0.018	0.11	
			204				(0.10)	(0.020)	(0.12)	
			205		28	Cane	0.11	0.022	0.13	
							0.058	0.011	0.069	
							(0.084)	(0.016)	(0.10)	

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Tree nuts

Pecan

A total of three field trials were conducted on pecans in the USA during the 2004-05 growing seasons (Green, 2006, METCON_154). Plants received 2 foliar applications of metconazole at rates of 268–306 g ai/ha. Pecans were harvested at 25–32 days after the last application. Residues of *cis*- and *trans*-metconazole were determined using method RM–41C–1 with a limit of quantification of 0.02 mg/kg. Overall mean procedural recoveries for *cis*- and *trans*-metconazole in pecans spiked at 0.02 and 0.1 mg/kg were 95 ± 8% (n = 4) and 96 ± 8% (n = 4), respectively.

Table 181 Residues of metconazole in pecan nuts following foliar treatment (cGAP USA: 4×123 g ai/ha; 25 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2004, Chula,	285	178	1094	Beginning shuck split	25	Nut meat	< 0.02	< 0.02	< 0.04	V200600111
	277		1016				< 0.02	< 0.02	< 0.04	2006/7017434

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
GA (TN 0672 Sumners)							(< 0.02)	(< 0.02)	(< 0.04)	V–27211-04-A METCON_154 Max. frozen storage: 4.3 months
USA, 2004, Anton, TX (TN 0672 Western Schley)	273 268	153	1151 1130	Beginning shuck split	25	Nut meat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	V200600111 2006/7017434 V–27211-04-D METCON_154 Max. frozen storage: 4.0 months
USA, 2004, Caldwell, TX (TN 0672 Cheyenne)	287 306	145	1197 1179	Hard dough	25	Nut meat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	V200600111 2006/7017434 V–27211-05-I METCON_154 Max. frozen storage: 3.5 months

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Almonds

A total of seven field trials were conducted on almonds in the USA during the 2003 and 2005 growing seasons (Green, 2006, METCON_155). Plants received 2 foliar applications of metconazole at nominal rates of 304 g ai/ha. Two trial also received an exaggerated rate of 2 application at 608 g ai/ha. Additional samples from a decline trial were collected at 15, 20, 25 and 30 DALA. Almonds were harvested at 25 days after the last application. Residues of *cis*- and *trans*-metconazole were determined using method RM–41C–1 with a limit of quantification of 0.02 mg/kg. Overall mean procedural recoveries for *cis*- and *trans*-metconazole in pecans spiked from 0.02 to 4.0 mg/kg were 93 ± 8% (n = 17) and 94 ± 6% (n = 17), respectively.

Table 182 Residues of metconazole in almonds following foliar treatment (cGAP USA: 4×123 g ai/ha; 25 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2003, Orland, CA (TN 0660 Non-Pareil)	307 306	155	1034 1038	100% hull split	25	Nut meat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	V200600153 2006/7017431 V–25700-03-A
	608 607	155	1031 1038	100% hull split	25	Nut meat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	METCON_155 Max. frozen storage: 7.5 months
USA, 2003, Madera, CA (TN 0660 Non-Pareil)	308 306	138	1313 1307	Formed almond full	15	Nut meat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	V200600153 2006/7017431 V–25700-03-B
					20		< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	METCON_155 Max. frozen storage: 8.7 months
					25		< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	
					30		< 0.02	< 0.02	< 0.04	

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
							< 0.02 (< 0.02)	< 0.02 (< 0.02)	< 0.04 (< 0.04)	
USA, 2003, Yuba City, CA (TN 0660 Non-Pareil)	304 304	138	934 936	Hull split	25	Nut meat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	V200600153 2006/7017431 V–25700-03-C METCON_155 Max. frozen storage: 8.3 months
USA, 2003, Kerman, CA (TN 0660 Non-Pareil)	304 304	144	1209 1208	Hull split 10%	25	Nut meat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	V200600153 2006/7017431 V–25700-03-D METCON_155 Max. frozen storage: 8.0 months
USA, 2003, Terra Bella, CA (TN 0660 Non-Pareil)	308 305	136	1402 1338	Hull split	25	Nut meat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	V200600153 2006/7017431 V–25700-03-E METCON_155 Max. frozen storage: 8.4 months
USA, 2005, Glenn, CA (TN 0660 Non-Pareil)	153 305	149	1032 1309	Hull split	25	Nut meat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	V200600153 2006/7017431 V–25700-03-F METCON_155 Max. frozen storage: 2.5 months
	152 304	149	1031 1310	Hull split	25	Nut meat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	
USA, 2005, Kerman, CA (TN 0660 Non-Pareil)	150 299	133	1109 1102	Hull split	25	Nut meat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	V200600153 2006/7017431 V–25700-03-G METCON_155 Max. frozen storage: 3.1 months
	151 299	133	1114 1106	Hull split	25	Nut meat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Oilseed

Oilseed rape

A total of 18 field trials were conducted on oilseed rape in the France during the 1995, 1996 and 1998 growing seasons (METCON_156 to METCON_161). Plants received 2 foliar applications of metconazole at nominal rates of 90 g ai/ha, one at first petal fall and the second 14 days later. For two trials the application rates were lower at 79 g ai/ha. Seeds were harvested at 28–70 days after the last application. Residues of *cis*- and *trans*-metconazole were determined using method FAMS 059-01 or FAMS 059-02 with a limit of quantification of 0.01 mg/kg. Overall mean procedural recoveries for *cis*- and *trans*-metconazole in oilseed rape seed were between 70–120% with an RDS of <20% for both methods and all analytes.

Table 183 Residues of metconazole in oilseed rape seeds following foliar treatment (cGAP Chile: 2×90 g ai/ha; 42 days PHI).

Location,	Application g ai/ha	Interval	L/ha	Growth stage at	DALA	Sample	Residues found [mg/kg] Metconazole	Total	Report/Trial No., Reference,

Year (variety [a])		(days)		final appl.			*cis*	*trans*		Storage period
France, 1995, Le Plessis Herbert (Gazelle)	2 × 90	14	400 400	Z71 [Zadoks]	62	Seeds	< 0.01	< 0.01	< 0.02	MK-FR–95–122 MK–750-003 95–122–396 METCON_156 Max. frozen storage: 4 months
France, 1995, Le Plessis Herbert (Synergy)	2 × 90	14	400 400	Z71 [Zadoks]	70	Seeds	< 0.01	< 0.01	< 0.02	MK-FR–95–122 MK–750-003 95–122–397 METCON_156 Max. frozen storage: 5 months
France, 1996, Carniac et St. denis (Synergy)	2 × 90	14	400 400	69	57	Seeds	0.040	< 0.01	0.05	MK-FR–96–217 MK–750-004 96–217–297 METCON_157 Max. frozen storage: 5 months
France, 1996, Martres (Groeland)	2 × 90	14	400 400	69	57	Seeds	0.010	< 0.01	0.020	MK-FR–96–217 MK–750-004 96–217–298 METCON_157 Max. frozen storage: 5 months
France, 1996, Martres (Synergy)	2 × 90	14	400 400	69	57	Seeds	0.010	< 0.01	0.020	MK-FR–96–217 MK–750-004 96–217–299 METCON_157 Max. frozen storage: 5 months
France, 1996, Velleron (Capitole)	2 × 90	14	367 367	69	39	Seeds	0.080	0.010	0.090	MK-FR–96–217 MK–750-004 96–217–603 METCON_157 Max. frozen storage: 5 months
France, 1996, Boncourt (Capitole)	2 × 90	14	364 364	69–71	65	Seeds	< 0.01	< 0.01	< 0.02	MK-FR–96–216 MK–750-005 96–216–318 METCON_158 Max. frozen storage: 4 months
France, 1996, Pignicourt (Goeland)	2 × 90	16	300 300	71	56	Seeds	0.050	< 0.01	0.060	MK-FR–96–216 MK–750-005 96–216–420 METCON_158 Max. frozen storage: 4 months
France, 1996, Caillouet (Goeland)	2 × 90	14	364 364	69/71	65	Seeds	< 0.01	< 0.01	< 0.02	MK-FR–96–215 MK–750-006 96–215–316 METCON_159 Max. frozen storage: 4 months
France, 1996, Pacy sur eure Orgeville (Goeland)	2 × 90	14	364 364	69/71	65	Seeds	< 0.01	< 0.01	< 0.02	MK-FR–96–215 MK–750-006 96–215–317 METCON_159 Max. frozen storage: 4 months
France, 1996,	2 × 90	16	300	71	56	Seeds	0.030	< 0.01	0.040	MK-FR–96–215

Location, Year (variety [a])	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				Metconazole *cis*	Metconazole *trans*	Total	
Epoye (Synergy)			300							MK–750-006 96–215–318 METCON_159 Max. frozen storage: 4 months
France, 1996, Pignicourt (Goeland)	2 × 90	16	300 300	69	56	Seeds	0.060	0.010	0.070	MK-FR–96–215 MK–750-006 96–215–319 METCON_159 Max. frozen storage: 4 months
France, 1996, Velleron (Capitole)	2 × 90	14	367 367	69	39	Seeds	0.040	< 0.010	0.050	MK-FR–96–218 MK–750-007 96–218–604 METCON_160 Max. frozen storage: 7 months
France, 1996, Carniac et St. denis (Synergy)	2 × 90	14	400 400	75	57	Seeds	0.030	< 0.010	0.040	MK-FR–96–218 MK–750-007 96–218–294 METCON_160 Max. frozen storage: 7 months
France, 1996, Martres (Groeland)	2 × 90	14	400 400	75	57	Seeds	0.020	< 0.01	0.030	MK-FR–96–218 MK–750-007 96–218–295 METCON_160 Max. frozen storage: 7 months
France, 1996, Martres (Synergy)	2 × 90	14	400 400	75	56	Seeds	0.090	0.002	0.11	MK-FR–96–218 MK–750-007 96–218–296 METCON_160 Max. frozen storage: 7 months
France, 1998, Martres (Synergy)	2×79	15	431 431	69–71	62	Seeds	< 0.01	< 0.01	< 0.02	MK-FR–98–103 MK–750-009 98–103–283
	2×79	13	431 431	75–77	28	Seeds	0.010	< 0.01	0.020	METCON_161 Max. frozen storage: 7 months
France, 1998, St. Brice (Synergy)	2×79	14	431 431	67–69	63	Seeds	0.020	< 0.01	0.020	MK-FR–98–103 MK–750-009 98–103–284
	2×79	14	431 431	75–77	29	Seeds	0.050	< 0.01	0.060	METCON_161 Max. frozen storage: 7 months

[a] It was noted that several trials were performed at the same location and year and therefore could not be considered as independent. Hence, the highest residue value from each of these locations was selected.

Additionally, a total of eight field trials were conducted on oilseed rape in the USA during the 2006 growing season (Green, 2006, METCON_162). Plants received a single foliar application of metconazole at nominal rates of 139–146 g ai/ha. Two trial also received an exaggerated rate of one application at 274–280 g ai/ha (2×) and 1 trial at 708 g ai/ha (5×). Oilseed rape seeds were cut at 35–49 DALA harvested at 49–56 days after the last application. One site (trial D) had samples that were cut 21, 28, 35, and 42 DALA; with sample collection 35, 42, 49, and 56 DALA. Residues of *cis*- and

trans-metconazole were determined using method RM–41C–1 or RM–41C–3 with a limit of quantification of 0.02 mg/kg, while residues of the triazole metabolites (1,2,4-triazole, triazolyl alanine, and triazolyl acetic acid) were determined using method Meth–160 with a limit of quantification of 0.02 mg/kg. It should be noted that for the determination of triazole metabolites, samples from more than one trial were pooled. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of <20%.

Table 184 Residues of metconazole in oilseed rape following foliar treatment (cGAP USA: 1×140 g ai/ha; 35 days PHI).

Location, Year (variety)	Application			Growth stage at final appl.	DALA [b]	Sample	Residues found [mg/kg] [a]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				Metconazole *cis*	Metconazole *trans*	Total	
USA, 2006, Campbell, MN (Marksman)	140	-	375	Bloom	49/49	Seeds	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	29989 2007/00642 V–29989-06-A
	280	-	376	Bloom	49/49	Seeds	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	METCON_162 Max. frozen storage: 3.4 months
USA, 2006, Northwood, ND (Pioneer 45H21)	139	-	370	60	35/39	Seeds	< 0.02 0.02 (0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 0.04 (0.04)	29989 2007/00642 V–29989-06-B METCON_162 Max. frozen storage: 4.0 months
USA, 2006, Velva, ND (Invigor 5630)	143	-	345	10% bloom	35/50	Seeds	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	29989 2007/00642 V–29989-06-C METCON_162 Max. frozen storage: 3.7 months
USA, 2006, Velva, ND (Hyola 357 RR Magnum)	142	-	341	Start of bloom	21/35	Seeds	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	29989 2007/00642 V–29989-06-D
	145		348	50% bloom	28/42	Seeds	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	METCON_162 Max. frozen storage: 3.8 months
	146		352	30% bloom	35/49	Seeds	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	
	144		348	5% bloom	42/56	Seeds	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	
USA, 2006, Ephrata, WA (Monsanto 47755/65037)	141	-	377	61–62	35/47	Seeds	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	29989 2007/00642 V–29989-06-E METCON_162 Max. frozen storage: 4.4 months
USA, 2006, Jerome, ID (Phoenix) [c]	141	-	340	66	40/56	Seeds	0.04 0.04 (0.04)	< 0.02 < 0.02 (< 0.02)	0.06 0.06 (0.06)	29989 2007/00642 V–29989-06-F METCON_162 Max. frozen storage: 3.5 months
USA, 2006,	145	-	369	Late	37/49	Seeds	0.02	< 0.02	0.04	29989

Location, Year (variety)	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA [b]	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
American Falls, ID (Hylite–618 CL)				flowering			< 0.02 (0.02)	< 0.02 (< 0.02)	< 0.04 (0.04)	2007/00642 V–29989-06-G
	274	-	348	Late flowering	37/49	Seeds	0.02 0.02 (0.02)	< 0.02 < 0.02 (< 0.02)	0.04 0.04 (0.04)	METCON_162 Max. frozen storage: 3.2 months
USA, 2006, Velva, ND (Invigor 5550)	144	-	345	40% bloom	35/49	Seeds	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	29989 2007/00642 V–29989-06-H
	708	-	340	40% bloom	35/49	Seeds	< 0.02 < 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 < 0.04 (< 0.04)	METCON_162 Max. frozen storage: 4.0 months

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] Days after last application; cut / collected

[c] Sample not clean seed (probably contained fragments of the shell of the pods). Not commercial quality.

Table 185 Residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), and triazolyl acetic acid (TAA) in oilseed rape following foliar treatment (cGAP Chile: 2×90 g ai/ha; 42 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA [b]	Sample	Residues found [mg/kg] [a] T	TA	TAA	Report/Trial No., Reference, Storage period
USA, 2006, Campbell, MN (Marksman)	140	-	375	Bloom	49/49	Seeds	< 0.01 < 0.01 (< 0.01)	0.18 0.18 (0.18)	< 0.01 < 0.01 (< 0.01)	29989 2007/00642 V–29989-06-A
USA, 2006, Northwood, ND (Pioneer 45H21)	139	-	370	60	35/39					V–29989-06-B METCON_162 Max. frozen storage: 9.4 months
USA, 2006, Velva, ND (Invigor 5630)	143	-	345	10% bloom	35/50	Seeds	< 0.01 < 0.01 (< 0.01)	0.25 0.30 (0.27)	< 0.01 < 0.01 (< 0.01)	29989 2007/00642 V–29989-06-C
USA, 2006, Velva, ND (Hyola 357 RR Magnum)	142 145	-	341 348	Start of bloom 50%	21/35 28/42					V–29989-06-D V–29989-06-H METCON_162 Max. frozen storage: 9.4 months
USA, 2006, Velva, ND (Invigor 5550)	145	-	369	Late flowering	37/49					
USA, 2006, Ephrata, WA (Monsanto 47755/65037)	141	-	377	61–62	35/47	Seeds	< 0.01 < 0.01 (< 0.01	0.47 0.50 (0.49)	< 0.01 < 0.01 (< 0.01)	29989 2007/00642 V–29989-06-E V–29989-06-G
USA, 2006, American Falls, ID (Hylite–618 CL)	145	-	369	Late flowering	37/49					METCON_162 Max. frozen storage: 10 months

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] Days after last application; cut / collected

Sunflower

A total of 11 field trials were conducted on sunflowers in Canada and the USA in the 2010 growing season (Corley, 2013, METCON_163). Plants received 2 foliar applications of metconazole at nominal rates of 140 g ai/ha. At one site an exaggerated rate of 700 g ai/ha was used additionally. Sunflower seeds were harvested at 20–21 days after the last application. Additional samples for decline determination were collected from one trial at 7, 14 and 27 DALA. Residues of *cis*- and *trans*-metconazole were determined using method RM–41C–1with a limit of quantification of 0.02 mg/kg. The triazole metabolite triazolyl alanine was determined using method Meth–160 with a limit of quantification of 0.02 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of < 20%.

Table 186 Residues of metconazole in sunflower seeds following foliar treatment (cGAP USA, Canada: 2×140 g ai/ha; 21 days PHI).

Location, Year (variety) [b]	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				Metconazole *cis*	Metconazole *trans*	Total	
USA, 2010 Velva, ND (Triumph 655)	140 150	7	140 150	Seed filling	21	Whole seed	0.81 0.33 (0.57)	0.16 0.06 (0.11)	0.97 0.39 (0.68)	10390 2013/1418320 ND19 METCON_163 Max. frozen storage: 12 months
USA, 2010 Velva, ND (Triumph 655)	140 150	7	140 150	Seed formation	21	Whole seed	0.18 0.16 (0.17) Control: 0.022	0.032 0.027 (0.030)	0.21 0.19 (0.20)	10390 2013/1418320 ND20 METCON_163 Max. frozen storage: 12 months
USA, 2010 Fargo, ND (06 DMR, NS)	140 140	7	112 112	20% green tissue	21	Whole seed	< 0.02 0.0260 (0.023)	< 0.02 < 0.02 (< 0.02)	< 0.04 0.046 (0.043)	10390 2013/1418320 ND21
	710 710	7	112 112	10% green tissue	21	Whole seed	0.170	0.0362	0.206	METCON_163 Max. frozen storage: 12 months
USA, 2010 Fargo, ND (4651 NS)	140 140	7	281 271	20% green tissue	7 14 21 27	Whole seed	< 0.02 0.025 (0.023) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 0.0218 (0.021)	< 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02)	< 0.04 0.045 (0.043) < 0.04 < 0.04 (< 0.04) < 0.04 < 0.04 (< 0.04) < 0.04 0.042 (0.041)	10390 2013/1418320 ND22 METCON_163 Max. frozen storage: 13 months
USA, 2010 Grand Island, NE (3080 DMR, NS)	140 140	7	140 140	Seed ripening	20	Whole seed	0.11 0.041 (0.076)	< 0.02 < 0.02 (< 0.02)	0.13 0.061 (0.096)	10390 2013/1418320 NE03 METCON_163 Max. frozen storage: 13 months
USA, 2010 Grand Island, NE (115422)	140 140	7	281 281	Mature	20	Whole seed	< 0.02 0.030 (0.025)	< 0.02 < 0.02 (< 0.02)	0.04 0.05 (0.045)	10390 2013/1418320 NE04 METCON_163

Location, Year (variety) [b]	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				Metconazole *cis*	Metconazole *trans*	Total	
										Max. frozen storage: 13 months
USA, 2010 Las Cruces, NM (S–678)	140 140	7	196 206	Late blooming	20	Whole seed	0.020 < 0.02 (0.020)	< 0.02 < 0.02 (< 0.02)	0.040 < 0.04 (0.040)	10390 2013/1418320 NM11 METCON_163 Max. frozen storage: 14 months
USA, 2010 Aurora, SD (Garst 4596 HO)	140 140	7	215 224	R8, mature	21	Whole seed	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	10390 2013/1418320 SD06 METCON_163 Max. frozen storage: 14 months
Canada, 2010 Scott, SK (Pioneer 63A21)	140 140	7	108 109	Flowering	21	Whole seed	0.21 0.22 (0.22)	< 0.02 < 0.02 (< 0.02)	0.23 0.24 (0.24)	10390 2013/1418320 SK01 METCON_163 Max. frozen storage: 13 months
Canada, 2010 Scott, SK (Pioneer 63A21)	140 140	7	108 109	Flowering declining	21	Whole seed	0.17 0.18 (0.18)	< 0.02 < 0.02 (< 0.02)	0.19 0.20 (0.20)	10390 2013/1418320 SK02 METCON_163 Max. frozen storage: 13 months
Canada, 2010 Vansony, SK (63A21-N434)	140 140	8	97 99	85–87	21	Whole seed	0.052 0.077 (0.064)	0.021 0.027 (0.024)	0.073 0.10 (0.089)	10390 2013/1418320 SK03 METCON_163 Max. frozen storage: 14 months

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] It was noted that several trials (ND19 and ND20, ND21 and ND22, NE03 and NE04, SK01 and SK02) were performed at the same location and that application dates were the same or differed by one week or less. Therefore trials could not be considered as independent and the highest residue value from each of these locations was selected.

Table 187 Residues of triazole metabolite triazolyl alanine (TA) in sunflower seeds following foliar treatment (cGAP USA, Canada: 2×140 g ai/ha; 21 days PHI).

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a]	Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				TA	
USA, 2010 Velva, ND (Triumph 655)	140 150	7	140 150	Seed filling	21	Whole seed	0.051 0.053 (0.052)	10390 2013/1418320 ND19 METCON_163 Max. frozen storage: 13 months
USA, 2010 Velva, ND (Triumph 655)	140 150	7	140 150	Seed formation	21	Whole seed	0.24 0.25 (0.24)	10390 2013/1418320 ND20 METCON_163 Max. frozen storage: 13 months

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a]	Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				TA	
USA, 2010 Fargo, ND (06 DMR, NS)	140 140	7	112 112	20% green tissue	21	Whole seed	0.021 0.022 (0.021)	10390 2013/1418320 ND21
	710 710	7	112 112	10% green tissue	21	Whole seed	0.020 0.058 < 0.02	METCON_163 Max. frozen storage: 13 months
USA, 2010 Fargo, ND (4651 NS)	140 140	7	281 271	20% green tissue	7 14 21 27	Whole seed	< 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02)	10390 2013/1418320 ND22 METCON_163 Max. frozen storage: 14 months
USA, 2010 Grand Island, NE (3080 DMR, NS)	140 140	7	140 140	Seed ripening	20	Whole seed	0.067 0.066 (0.066)	10390 2013/1418320 NE03 METCON_163 Max. frozen storage: 14 months
USA, 2010 Grand Island, NE (115422)	140 140	7	281 281	Mature	20	Whole seed	0.041 0.043 (0.042)	10390 2013/1418320 NE04 METCON_163 Max. frozen storage: 14 months
USA, 2010 Las Cruces, NM (S–678)	140 140	7	196 206	Late blooming	20	Whole seed	0.063 0.068 (0.065)	10390 2013/1418320 NM11 METCON_163 Max. frozen storage: 16 months
USA, 2010 Aurora, SD (Garst 4596 HO)	140 140	7	215 224	R8, mature	21	Whole seed	0.075 0.071 (0.073)	10390 2013/1418320 SD06 METCON_163 Max. frozen storage: 15 months
Canada, 2010 Scott, SK (Pioneer 63A21)	140 140	7	108 109	Flowering	21	Whole seed	0.059 0.054 (0.056)	10390 2013/1418320 SK01 METCON_163 Max. frozen storage: 14 months
Canada, 2010 Scott, SK (Pioneer 63A21)	140 140	7	108 109	Flowering declining	21	Whole seed	0.023 0.026 (0.024)	10390 2013/1418320 SK02 METCON_163 Max. frozen storage: 14 months
Canada, 2010 Vansony, SK (63A21-N434)	140 140	8	97 99	85–87	21	Whole seed	0.026 0.025 (0.025)	10390 2013/1418320 SK03 METCON_163

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a]	Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				TA	
								Max. frozen storage: 15 months

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Cotton seed

A total of 12 field trials were conducted on cotton in the USA during the 2006 growing season (Carringer, 2007, METCON_164). Plants received 3 foliar applications of metconazole at nominal rates of 110 g ai/ha. Additionally, one trial received an exaggerated rate at 3×550 g ai/ha. Cotton seeds were harvested at 29–32 days after the last application. Residues of *cis*- and *trans*-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0604. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.01 mg/kg or 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of < 20%.

Residues of metabolites M11, M21 and M30, were each below their LOQ of 0.01 mg/kg in all trials.

Table 188 Residues of *cis*- and *trans*-metconazole in cotton seeds following foliar treatment (cGAP USA: 3 × 92 g ai/ha; 30 days PHI).

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				Metconazole *cis*	Metconazole *trans*	Total	
USA, 2006, Chula, GA (PHY 480 WR)	3 × 110	- 7 7	178 187 178	50% open bolls	30	Seeds	0.062 0.048 (0.055)	0.015 0.011 (0.013)	0.077 0.059 (0.068)	254317 2007/7001663 RCN R06450 METCON_164 Max. frozen storage: 3.0 months
USA, 2006, Newport, AR (DP444 BG/RR)	3 × 110	- 6 7	94 94 94	81	30	Seeds	0.017 0.020 (0.019)	0.005 0.006 (0.006)	0.022 0.026 (0.024)	254317 2007/7001663 RCN R06451 METCON_164 Max. frozen storage: 4.2 months
USA, 2006, Cheneyville, LA (PHY 485 WRF)	3 × 110	- 7 7	159 215 215	81	29	Seeds	0.020 0.021 (0.021)	0.006 0.006 (0.006)	0.026 0.027 (0.027)	254317 2007/7001663 RCN R06452 METCON_164 Max. frozen storage: 4.0 months
USA, 2006, Proctor AR (DP444BR)	3 × 110	- 7 7	122 122 122	15% open bolls	30	Seeds	0.017 0.012 (0.015)	0.006 < 0.005 (0.006)	0.023 0.017 (0.020)	254317 2007/7001663 RCN R06453 METCON_164 Max. frozen storage: 4.5 months
USA, 2006, Uvalde, TX (DPL 444)	3 × 110	- 7 7	131 140 131	81	31	Seeds	0.011 0.023 (0.017)	< 0.005 0.005 (0.005)	0.016 0.028 (0.022)	254317 2007/7001663 RCN R06454 METCON_164 Max. frozen storage: 6.4 month
	3 × 550	- 7 7	140 140 140	81	31	Seeds	0.029 0.023 (0.026)	0.12 0.097 (0.11)	0.14 0.12 (0.13)	
USA, 2006,	3 × 110	-	140	79–80	30	Seeds	0.023	0.006	0.030	254317

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
Levelland, TX (FM9063 B2F)		8 7	140 140				0.042 (0.033)	0.011 (0.009)	0.053 (0.042)	2007/7001663 RCN R06455 METCON_164 Max. frozen storage: 2.8 month
USA, 2006, Wolfforth, TX (Fiber Max 960 BG II)	3 × 110	- 6 8	140 140 140	79	30	Seeds	0.065 0.050 (0.058)	0.015 0.012 (0.014)	0.080 0.062 (0.071)	254317 2007/7001663 RCN R06456 METCON_164 Max. frozen storage: 2.9 month
USA, 2006, Hinton, OK (DG 2242 B2RF)	3 × 110	- 7 7	112 196 206	87	32	Seeds	0.063 0.058 (0.061)	0.016 0.014 (0.015)	0.078 0.071 (0.075)	254317 2007/7001663 RCN R06457 METCON_164 Max. frozen storage: 3.4 month
USA, 2006, Dill City, OK (FM 960 B2R)	3 × 110	- 7 7	206 196 196	5% open bolls	31	Seeds	0.016 0.014 (0.015)	0.006 < 0.005 (0.006)	0.022 0.019 (0.021)	254317 2007/7001663 RCN R06458 METCON_164 Max. frozen storage: 3.3 month
USA, 2006, Tulare, CA (Sierra RR)	3 × 110	- 7 7	187 187 187	76	30	Seeds	0.028 0.053 (0.041)	0.007 0.012 (0.010)	0.036 0.065 (0.051)	254317 2007/7001663 RCN R06459 METCON_164 Max. frozen storage: 3.9 month
USA, 2006, Terra Bella, CA (Roundup Ready)	3 × 110	- 7 7	206 196 206	76	30	Seeds	0.017 0.019 (0.018)	0.005 0.005 (0.005)	0.023 0.025 (0.024)	254317 2007/7001663 RCN R06460 METCON_164 Max. frozen storage: 3.7 month
USA, 2006, Yuma, AZ (450001 G)	3 × 110	- 7 7	234 234 234	50% open bolls	29	Seeds	0.18 0.20 (0.19)	0.041 0.047 (0.044)	0.22 0.26 (0.23)	254317 2007/7001663 RCN R06460 METCON_164 Max. frozen storage: 4.1 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 189 Residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), and triazolyl acetic acid (TAA) in cotton seed following foliar treatment (cGAP USA: 3×92 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] T	TA	TAA	Report/Trial No., Reference, Storage period
USA, 2006, Chula, GA (PHY 480 WR)	3 × 110	- 7 7	178 187 178	50% open bolls	30	Seeds	< 0.01 < 0.01 (< 0.01)	0.40 0.36 0.38	< 0.01 < 0.01 (< 0.01)	254317 2007/7001663 RCN R06450 METCON_164 Max. frozen storage: 3.0 months
USA, 2006, Newport, AR	3 × 110	- 6	94 94	81	30	Seeds	< 0.01 < 0.01	0.130 0.110	< 0.01 < 0.01	254317 2007/7001663

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				T	TA	TAA	
(DP444 BG/RR)		7	94				(< 0.01)	(0.120)	(< 0.01)	RCN R06451 METCON_164 Max. frozen storage: 4.2 months
USA, 2006, Cheneyville, LA (PHY 485 WRF)	3 × 110	- 7 7	159 215 215	81	29	Seeds	< 0.01 < 0.01 (< 0.01)	0.060 0.060 (0.060)	< 0.01 < 0.01 (< 0.01)	254317 2007/7001663 RCN R06452 METCON_164 Max. frozen storage: 4.0 months
USA, 2006, Proctor AR (DP444BR)	3 × 110	- 7 7	122 122 122	15% open bolls	30	Seeds	< 0.01 < 0.01 (< 0.01)	0.070 0.070 (0.070)	< 0.01 < 0.01 (< 0.01)	254317 2007/7001663 RCN R06453 METCON_164 Max. frozen storage: 4.5 months
USA, 2006, Uvalde, TX (DPL 444)	3 × 110	- 7 7	131 140 131	81	31	Seeds	< 0.01 0.040 (0.040)	< 0.05 < 0.05 (< 0.05)	< 0.01 < 0.01 (< 0.01)	254317 2007/7001663 RCN R06454 METCON_164 Max. frozen storage: 6.4 month
	3 × 550	- 7 7	140 140 140	81	31	Seeds	< 0.01 < 0.01 (< 0.01)	0.13 0.13 (0.13)	< 0.01 < 0.01 (< 0.01)	
USA, 2006, Levelland, TX (FM9063 B2F)	3 × 110	- 8 7	140 140 140	79–80	30	Seeds	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.05 < 0.05 (< 0.05)	254317 2007/7001663 RCN R06455 METCON_164 Max. frozen storage: 2.8 month
USA, 2006, Wolfforth, TX (Fiber Max 960 BG II)	3 × 110	- 6 8	140 140 140	79	30	Seeds	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.05 < 0.05 (< 0.05)	254317 2007/7001663 RCN R06456 METCON_164 Max. frozen storage: 2.9 month
USA, 2006, Hinton, OK (DG 2242 B2RF)	3 × 110	- 7 7	112 196 206	87	32	Seeds	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	0.13 0.15 (0.14)	254317 2007/7001663 RCN R06457 METCON_164 Max. frozen storage: 3.4 month
USA, 2006, Dill City, OK (FM 960 B2R)	3 × 110	- 7 7	206 196 196	5% open bolls	31	Seeds	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	0.10 0.10 (0.10)	254317 2007/7001663 RCN R06458 METCON_164 Max. frozen storage: 3.3 month
USA, 2006, Tulare, CA (Sierra RR)	3 × 110	- 7 7	187 187 187	76	30	Seeds	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.05 < 0.05 (< 0.05)	254317 2007/7001663 RCN R06459 METCON_164 Max. frozen storage: 3.9 month
USA, 2006, Terra Bella, CA (Roundup Ready)	3 × 110	- 7 7	206 196 206	76	30	Seeds	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	0.110 0.120 (0.115)	254317 2007/7001663 RCN R06460 METCON_164 Max. frozen storage: 3.7 month
USA, 2006,	3 × 110	-	234	50% open	29	Seeds	< 0.01	< 0.01	< 0.05	254317

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] T	TA	TAA	Report/Trial No., Reference, Storage period
Yuma, AZ (450001 G)		7 7	234 234	bolls			< 0.01 (< 0.01)	< 0.01 (< 0.01)	< 0.05 (< 0.05)	2007/7001663 RCN R06460 METCON_164 Max. frozen storage: 4.1 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Peanut

A total of 14 field trials were conducted on peanuts in the USA during the 2005 and 2006 growing seasons (Green, 2006, METCON_165). Plants received 2 foliar applications of metconazole at rates of 270–290 g ai/ha. Three trial also received an exaggerated rate of 2 applications at 560 g ai/ha (2×) and 1 trial at 1400 g ai/ha (5×). Peanuts were harvested at 13–15 days after the last application. For most of the trials, peanuts were dug 13–15 days after the final application. In two trials (trial C and trial L) peanuts were dug 10, 14, 19 (or 17), and 22 DALA to provide a decline curve. For trial N, peanuts were dug 18 DALA due to wet weather. After the peanuts were dug, they were allowed to dry in the field (typically 5 to 9 days) before being collected. Residues of *cis*- and *trans*-metconazole were determined using method RM–41C–1 with a limit of quantification of 0.02 mg/kg. Overall mean procedural recoveries for cis- and trans-metconazole in peanut meat spiked at 0.02 mg/kg and 0.1 mg/kg were 100 ± 4% (n = 20) and 100 ± 6% (n = 20), respectively.

Table 190 Residues of *cis*- and *trans*-metconazole in peanuts following foliar treatment (cGAP USA: 4 × 140 g ai/ha; 14 day PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2004, Sunbury, NC (NC-V11)	292 284	14	205 217	Mature	14	Nutmeat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	25689 2006/1051359 V–25689-04-A
	586 565	14	206 219	Mature	14	Nutmeat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	METCON_165 Max. frozen storage: 3.8 months
USA, 2005, Suffolk, VA (Gregory Lot# W–818)	287 286	14	194 193	Near maturity	13	Nutmeat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	25689 2006/1051359 V–25689-05-B METCON_165 Max. frozen storage: 3.7 months
USA, 2005, Elko, SC (Georgia Green)	282 282	15	184 180	Near maturity	10 14 19 22	Nutmeat	< 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02) < 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 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 (< 0.04) < 0.04 < 0.04 (< 0.04) < 0.04 < 0.04 (< 0.04)	25689 2006/1051359 V–25689-05-C METCON_165 Max. frozen storage: 3.7 months
USA, 2005, Athens, GA (Georgia Green)	279 279	14	192 187	70% mature pods	14	Nutmeat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	25689 2006/1051359 V–25689-05-D

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
	556 561	14	191 187	70% mature pods	14	Nutmeat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	METCON_165 Max. frozen storage: 3.7 months
USA, 2005, Sycamore, GA (Georgia Green)	280 282	14	187 184	Mature peanut	15	Nutmeat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	25689 2006/1051359 V–25689-05-E METCON_165 Max. frozen storage: 4.0 months
USA, 2005, Chula, GA (Georgia Green)	283 283	13	191 184	Pod fill	14	Nutmeat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	25689 2006/1051359 V–25689-05-F METCON_165 Max. frozen storage: 4.2 months
USA, 2005, Gordon, AL (Georgia Green)	270 278	14	182 183	Pod fill	14	Nutmeat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	25689 2006/1051359 V–25689-05-G METCON_165 Max. frozen storage: 4.3 months
USA, 2005, Columbia, AL (Carver's)	277 270	14	181 179	Pod fill	14	Nutmeat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	25689 2006/1051359 V–25689-05-H METCON_165 Max. frozen storage: 4.3 months
USA, 2005, Columbia, AL (Georgia Green)	282 283	15	188 184	Mature peanut	15	Nutmeat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	25689 2006/1051359 V–25689-05-I METCON_165 Max. frozen storage: 4.0 months
USA, 2005, Greenville, FL (Georgia Green)	285 283	15	190 185	Mature peanut	15	Nutmeat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	25689 2006/1051359 V–25689-05-J METCON_165 Max. frozen storage: 4.0 months
USA, 2005, East Bernard, TX (TAMSPAN90)	283 278	14	190 186	75	15	Nutmeat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	25689 2006/1051359 V–25689-05-K
	571 558	14	191 186	75	15	Nutmeat	< 0.02 0.02 0.055 0.02 (0.025)	< 0.02 < 0.02 < 0.02 < 0.02 (< 0.02)	< 0.04 0.04 0.07 0.04 (0.045)	METCON_165 Max. frozen storage: 4.2 months
USA, 2005, Stephenville, TX (Tamrun 96)	279 283	14	187 189	Late pegging	10	Nutmeat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	25689 2006/1051359 V–25689-05-L METCON_165 Max. frozen storage: 4.0 months
USA, 2005, Levelland, TX (Spanco)	281 277	14	188 186	Late pegging	13	Nutmeat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	25689 2006/1051359 V–25689-05-M METCON_165 Max. frozen

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
										storage: 4.2 months
USA, 2005, Greenville, MS (Georgia Green)	276 284	13	185 190	Flowering	18	Nutmeat	< 0.02 < 0.02 (< 0.02)	< 0.02 < 0.02 (< 0.02)	< 0.04 < 0.04 (< 0.04)	25689 2006/1051359 V–25689-05-N
	1389 1410	13	185 188	Flowering	18	Nutmeat	0.04 0.05 0.06 (0.05)	< 0.01 < 0.01 < 0.01 (< 0.01)	0.04 0.05 0.06 (0.05)	METCON_165 Max. frozen storage: 4.2 months

[a] Results from 2 or 3 replicate field samples are presented and values in parentheses represent mean values

Animal feed items

Soya bean forage

A total of six field trials were conducted on soya beans in the USA during the 2004 growing season (Leonard, 2005, METCON_143). Plants received 2 foliar applications of metconazole at nominal rates of 80 g ai/ha with 0.25% adjuvant. Soya bean forage was harvested 7 days after the last application. Residues of *cis*- and *trans*-metconazole were determined using method 550/0 with a limit of quantification of 0.005 mg/kg per isomer. Method validation and procedural recoveries for all trials were within 70–120% with an RSD of < 20%.

Table 191 Residues of *cis*- and *trans*-metconazole in soya bean forage following foliar treatment (cGAP USA: 2×63 g ai/ha; 14 day PHI).

Location, Year (variety)	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Residues (mg/kg) Sample	DALA	Metconazole *cis*-	*trans*-	Total	Report/Trial No., Reference, Storage period
USA, 2004, Chula, GA, (Dekalb H7242RR)	80 80	- 10	207 206	BBCH 79	Soya bean forage	7	1.6 1.5 (1.6)	0.33 0.32 (0.33)	2.0 1.9 (1.9)	204640 2004/5000755 RCN 2004192 METCON_143 Max. frozen storage: 2 month
USA, 2004, Newport, AR, (Genesis C444NRR)	80 80	- 10	189 188	BBCH 79	Soya bean forage	7	0.82 1.1 (0.98)	0.18 0.23 (0.21)	1.0 1.4 (1.2)	204640 2004/5000755 RCN 2004193 METCON_143 Max. frozen storage: 2 month
USA, 2004, Proctor, AR, (DP5634RR)	80 80	- 10	189 190	BBCH 79	Soya bean forage	7	1.5 1.7 (1.6)	0.29 0.33 (0.31)	1.8 2.0 (1.9)	204640 2004/5000755 RCN 2004194 METCON_143 Max. frozen storage: 2 month
USA, 2004, Stoneville, MS, (Pioneer 95B96)	80 80	- 10	188 189	BBCH 79	Soya bean forage	7	1.2 1.9 (1.6)	0.25 0.38 (0.32)	1.5 2.3 (1.9)	204640 2004/5000755 RCN 2004195 METCON_143 Max. frozen storage: 2 month
USA, 2004, Arkansaw,	80 80	- 10	188 189	BBCH 79	Soya bean	7	1.0 1.0	0.20 0.21	1.2 1.2	204640 2004/5000755

WI, (NK S20-G4)					forage		(1.0)	(0.21)	(1.2)	RCN 2004196 METCON_143 Max. frozen storage: 3 month
USA, 2004, Carlyle, IL, (BT–383CR)	80 80	- 10	100 95	BBCH 79	Soya bean forage	7	1.6 2.0 (1.8)	0.34 0.39 (0.37)	1.9 2.4 (2.2)	204640 2004/5000755 RCN 2004197 METCON_143 Max. frozen storage: 3 month

Additionally, a total of 15 field trials were conducted on soya bean in Canada and the USA during the 2005 growing season (White & Saha, 2006, METCON_144). Plants received 2 foliar applications of metconazole at nominal rates of 80 g ai/ha. Soya bean forage was harvested at 6–8 days after the last application. Residues of *cis*- and *trans*-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0508. The limit of quantification for the sum of *cis*- and *trans*-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of < 20%.

Table 192 Residues of *cis*- and *trans*-metconazole in soya bean forage following foliar treatment (cGAP USA: 2×63 g ai/ha; 14 day PHI).

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
USA, 2005, Chula, GA, (Dekalb H7242RR)	80 80	- 10	176 180	BBCH 79	Soya bean forage	7	0.89 0.79 (0.84)	0.20 0.18 (0.19)	1.1 0.97 (1.0)	137726 2006/7006995 R05111 METCON_144 Max. frozen storage: 5.2 month
USA, 2005, Theilman, MN, (Asgrow AG1603)	80 80	- 10	189 187	BBCH 77	Soya bean forage	7	0.56 0.65 (0.60)	0.11 0.14 (0.13)	0.67 0.79 (0.73)	137726 2006/7006995 R05112 METCON_144 Max. frozen storage: 6 month
USA, 2005, Dumfries, MN, (Asgrow AG1603)	80 80	- 10	188 185	BBCH 77	Soya bean forage	7	0.88 0.82 (0.85)	0.16 0.17 (0.16)	1.0 1.0 (1.0)	137726 2006/7006995 R05113 METCON_144 Max. frozen storage: 6 month
USA, 2004, Grandfork, IL, (DKB38–52)	80 80	- 10	149 151	BBCH 79	Soya bean forage	7	0.78 0.82 (0.80)	0.15 0.17 (0.16)	0.93 0.99 (0.96)	137726 2006/7006995 R05114 METCON_144 Max. frozen storage: 5.7 month
USA, 2005, Carlyle, IL, (NK 43-B1)	80 80	- 11	175 184	BBCH 79	Soya bean forage	7	0.89 0.91 (0.90)	0.17 0.18 (0.17)	1.1 1.1 (1.1)	137726 2006/7006995 R05115 METCON_144 Max. frozen storage: 5.4

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
										month
USA, 2005, Wyoming, IL, (Asgrow 3202)	80 80	- 11	176 175	BBCH 89	Soya bean forage	7	1.7 1.9 (1.8)	0.30 0.41 (0.37)	2.0 2.3 (2.2)	137726 2006/7006995 R05116 METCON_144 Max. frozen storage: 5.4 month
USA, 2005, Osceola, NB, (Pioneer 92M80)	80 80	- 10	184 189	BBCH 77	Soya bean forage	7	0.92 1.1 (1.0)	0.18 0.23 (0.20)	1.1 1.4 (1.2)	137726 2006/7006995 R05117 METCON_144 Max. frozen storage: 6.3 month
USA, 2005, York, NB, (Pioneer 92M80)	80 80	- 9	187 187	BBCH 77	Soya bean forage	7	1.3 1.3 (1.3)	0.29 0.32 (0.30)	1.6 1.7 (1.6)	137726 2006/7006995 R05118 METCON_144 Max. frozen storage: 6.2 month
USA, 2005, Grand Island, NB, (Dyna-Gro 37B28RR)	80 80	- 10	184 187	BBCH 77	Soya bean forage	8	0.60 0.59 (0.59)	0.12 0.12 (0.12)	0.72 0.71 (0.71)	137726 2006/7006995 R05119 METCON_144 Max. frozen storage: 6.3 month
Canada, 2005, Branchton, ON (Mycogen 5140RR)	80 80	- 9	262 299	BBCH 77	Soya bean forage	7	1.2 1.0 (1.1)	0.25 0.21 (0.23)	1.4 1.2 (1.3)	137726 2006/7006995 R05120 METCON_144 Max. frozen storage: 6.4 month
USA, 2005, Wapello, IA, (Pioneer 93M11)	80 80	- 10	135 137	BBCH 75	Soya bean forage	6	1.2 1.9 (1.5)	0.25 0.36 (0.31)	1.5 2.2 (1.9)	137726 2006/7006995 R05121 METCON_144 Max. frozen storage: 5.2 month
USA, 2005, Jefferson, IA, (Pioneer 93B87)	80 80	- 9	138 131	BBCH 75	Soya bean forage	7	1.5 1.5 (1.5)	0.30 0.31 (0.31)	1.8 1.8 (1.8)	137726 2006/7006995 R05122 METCON_144 Max. frozen storage: 5.3 month
USA, 2005, Keokuk, IA, (DeKalb 3451)	80 80	- 10	138 142	BBCH 75	Soya bean forage	8	1.1 1.7 (1.4)	0.23 0.34 (0.28)	1.4 2.1 (1.7)	137726 2006/7006995 R05123 METCON_144 Max. frozen storage: 5.2 month
USA, 2005, Conklin, MI, (Asgrow: AG1903)	80 80	- 10	192 191	BBCH 81	Soya bean forage	7	1.2 1.2 (1.2)	0.20 0.21 (0.20)	1.4 1.4 (1.4)	137726 2006/7006995 R05124 METCON_144

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
										Max. frozen storage: 5.1 month
Canada, 2005, St-Pie-de-Bagot, QC, (26-02R RR)	80 80	- 11	228 215	BBCH 79	Soya bean forage	7	0.55 0.40 (0.48)	0.09 0.07 (0.08)	0.64 0.47 (0.56)	137726 2006/7006995 R05125 METCON_144 Max. frozen storage: 5.3 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 193 Residues of metabolites M11, M21 and M30 in soya bean forage following foliar treatment (cGAP USA: 2×63 g ai/ha; 14 day PHI).

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolite			
							M11	M21	M30	
USA, 2005, Chula, GA, (Dekalb H7242RR)	80 80	- 10	176 180	BBCH 79	Soya bean forage	7	0.02 0.03 (0.03)	0.01 0.01 (0.01)	< 0.01 < 0.01 (< 0.01)	137726 2006/7006995 R05111 METCON_144 Max. frozen storage: 5.2 month
USA, 2005, Theilman, MN, (Asgrow AG1603)	80 80	- 10	189 187	BBCH 77	Soya bean forage	7	0.01 0.02 (0.02)	0.01 0.01 (0.01)	< 0.01 < 0.01 (< 0.01)	137726 2006/7006995 R05112 METCON_144 Max. frozen storage: 6 month
USA, 2005, Dumfries, MN, (Asgrow AG1603)	80 80	- 10	188 185	BBCH 77	Soya bean forage	7	0.02 0.02 (0.02)	0.01 0.01 (0.01)	< 0.01 < 0.01 (< 0.01)	137726 2006/7006995 R05113 METCON_144 Max. frozen storage: 6 month
USA, 2004, Grandfork, IL, (DKB38–52)	80 80	- 10	149 151	BBCH 79	Soya bean forage	7	0.05 0.06 (0.06)	0.01 0.02 (0.02)	0.01 0.01 (0.01)	137726 2006/7006995 R05114 METCON_144 Max. frozen storage: 5.7 month
USA, 2005, Carlyle, IL, (NK 43-B1)	80 80	- 11	175 184	BBCH 79	Soya bean forage	7	0.03 0.03 (0.03)	0.01 0.01 (0.01)	< 0.01 0.01 (0.01)	137726 2006/7006995 R05115 METCON_144 Max. frozen storage: 5.4 month
USA, 2005, Wyoming, IL, (Asgrow 3202)	80 80	- 11	176 175	BBCH 89	Soya bean forage	7	0.08 0.09 (0.09)	0.02 0.03 (0.03)	0.01 0.01 (0.01)	137726 2006/7006995 R05116 METCON_144 Max. frozen

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolite			
							M11	M21	M30	
										storage: 5.4 month
USA, 2005, Osceola, NB, (Pioneer 92M80)	80 80	- 10	184 189	BBCH 77	Soya bean forage	7	< 0.01 0.01 (0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137726 2006/7006995 R05117 METCON_144 Max. frozen storage: 6.3 month
USA, 2005, York, NB, (Pioneer 92M80)	80 80	- 9	187 187	BBCH 77	Soya bean forage	7	0.02 0.03 (0.03)	0.02 0.02 (0.02)	< 0.01 0.01 (0.01)	137726 2006/7006995 R05118 METCON_144 Max. frozen storage: 6.2 month
USA, 2005, Grand Island, NB, (Dyna-Gro 37B28RR)	80 80	- 10	184 187	BBCH 77	Soya bean forage	8	0.01 0.01 (0.01)	0.01 0.01 (0.01)	< 0.01 < 0.01 (< 0.01)	137726 2006/7006995 R05119 METCON_144 Max. frozen storage: 6.3 month
Canada, 2005, Branchton, ON (Mycogen 5140RR)	80 80	- 9	262 299	BBCH 77	Soya bean forage	7	0.05 0.05 (0.05)	0.02 0.02 (0.02)	0.01 < 0.01 (0.01)	137726 2006/7006995 R05120 METCON_144 Max. frozen storage: 6.4 month
USA, 2005, Wapello, IA, (Pioneer 93M11)	80 80	- 10	135 137	BBCH 75	Soya bean forage	6	0.02 0.04 (0.03)	0.02 0.03 (0.03)	0.01 0.01 (0.01)	137726 2006/7006995 R05121 METCON_144 Max. frozen storage: 5.2 month
USA, 2005, Jefferson, IA, (Pioneer 93B87)	80 80	- 9	138 131	BBCH 75	Soya bean forage	7	0.03 0.03 (0.03)	0.02 0.03 (0.03)	0.01 0.01 (0.01)	137726 2006/7006995 R05122 METCON_144 Max. frozen storage: 5.3 month
USA, 2005, Keokuk, IA, (DeKalb 3451)	80 80	- 10	138 142	BBCH 75	Soya bean forage	8	0.02 0.03 (0.03)	0.02 0.02 (0.02)	< 0.01 < 0.01 (< 0.01)	137726 2006/7006995 R05123 METCON_144 Max. frozen storage: 5.2 month
USA, 2005, Conklin, MI, (Asgrow: AG1903)	80 80	- 10	192 191	BBCH 81	Soya bean forage	7	0.04 0.04 (0.04)	0.02 0.01 (0.02)	0.01 0.01 (0.01)	137726 2006/7006995 R05124 METCON_144 Max. frozen storage: 5.1 month
Canada, 2005, St-Pie-de-	80 80	- 11	228 215	BBCH 79	Soya bean forage	7	0.01 < 0.01 (0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137726 2006/7006995 R05125

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolite			
							M11	M21	M30	
Bagot, QC, (26-02R RR)										METCON_144 Max. frozen storage: 5.3 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 194 Residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), and triazolyl acetic acid (TAA) in soya bean forage following foliar treatment (cGAP USA: 2×63 g ai/ha; 14 day PHI).

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolite			
							T	TA	TAA	
USA, 2005, Chula, GA, (Dekalb H7242RR)	80 80	- 10	176 180	BBCH 79	Soya bean forage	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	0.23 0.22 (0.23)	137726 2006/7006995 R05111 METCON_144 Max. frozen storage: 5.2 month
USA, 2005, Theilman, MN, (Asgrow AG1603)	80 80	- 10	189 187	BBCH 77	Soya bean forage	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05112 METCON_144 Max. frozen storage: 6 month
USA, 2005, Dumfries, MN, (Asgrow AG1603)	80 80	- 10	188 185	BBCH 77	Soya bean forage	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05113 METCON_144 Max. frozen storage: 6 month
USA, 2004, Grandfork, IL, (DKB38–52)	80 80	- 10	149 151	BBCH 79	Soya bean forage	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05114 METCON_144 Max. frozen storage: 5.7 month
USA, 2005, Carlyle, IL, (NK 43-B1)	80 80	- 11	175 184	BBCH 79	Soya bean forage	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05) Control: 0.17	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05115 METCON_144 Max. frozen storage: 5.4 month
USA, 2005, Wyoming, IL, (Asgrow 3202)	80 80	- 11	176 175	BBCH 89	Soya bean forage	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05116 METCON_144 Max. frozen storage: 5.4 month
USA, 2005, Osceola, NB, (Pioneer	80 80	- 10	184 189	BBCH 77	Soya bean forage	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05117 METCON_144

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolite			
							T	TA	TAA	
92M80)										Max. frozen storage: 6.3 month
USA, 2005, York, NB, (Pioneer 92M80)	80 80	- 9	187 187	BBCH 77	Soya bean forage	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05118 METCON_144 Max. frozen storage: 6.2 month
USA, 2005, Grand Island, NB, (Dyna-Gro 37B28RR)	80 80	- 10	184 187	BBCH 77	Soya bean forage	8	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05) Control: 0.05	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05119 METCON_144 Max. frozen storage: 6.3 month
Canada, 2005, Branchton, ON (Mycogen 5140RR)	80 80	- 9	262 299	BBCH 77	Soya bean forage	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05120 METCON_144 Max. frozen storage: 6.4 month
USA, 2005, Wapello, IA, (Pioneer 93M11)	80 80	- 10	135 137	BBCH 75	Soya bean forage	6	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05121 METCON_144 Max. frozen storage: 5.2 month, (TA: 5.7 month)
USA, 2005, Jefferson, IA, (Pioneer 93B87)	80 80	- 9	138 131	BBCH 75	Soya bean forage	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05122 METCON_144 Max. frozen storage: 5.3 month, (TA: 5.7 month)
USA, 2005, Keokuk, IA, (DeKalb 3451)	80 80	- 10	138 142	BBCH 75	Soya bean forage	8	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05123 METCON_144 Max. frozen storage: 5.2 month, (TA: 5.6 month)
USA, 2005, Conklin, MI, (Asgrow: AG1903)	80 80	- 10	192 191	BBCH 81	Soya bean forage	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05124 METCON_144 Max. frozen storage: 5.1 month, (TA: 5.5 month)
Canada, 2005, St-Pie-de-Bagot, QC,	80 80	- 11	228 215	BBCH 79	Soya bean forage	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05125 METCON_144

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolite			
							T	TA	TAA	
(26-02R RR)										Max. frozen storage: 5.3 month, (TA: 5.8 month)

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Soya bean hay

A total of six field trials were conducted on soya bean hay in the USA during the 2004 growing season (Leonard, 2005, METCON_143). Plants received 2 foliar applications of metconazole at nominal rates of 80 g ai/ha with 0.25% adjuvant. Soya bean hay was harvested 7 days after the last application and left to dry on the field for 2–7 days. Residues of *cis*- and *trans*-metconazole were determined using method 550/0 with a limit of quantification of 0.005 mg/kg per isomer. Method validation and procedural recoveries for all trials were within 70–120% with an RSD of < 20% (except one outlier).

Table 195 Residues of *cis*- and *trans*-metconazole in soya bean hay following foliar treatment (cGAP USA: 2 × 63 g ai/ha; 21 day PHI) in the USA.

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
USA, 2004, Chula, GA, (Dekalb H7242RR)	80 80	- 10	207 206	BBCH 79	Soya bean hay	7	2.8 2.6 (2.7)	0.56 0.59 (0.58)	3.4 3.2 (3.3)	204640 2004/5000755 RCN 2004192 METCON_143 Max. frozen storage: 2 month
USA, 2004, Newport, AR, (Genesis C444NRR)	80 80	- 10	189 188	BBCH 79	Soya bean hay	7	1.2 1.1 (1.2)	0.24 0.21 (0.23)	1.5 1.3 (1.4)	204640 2004/5000755 RCN 2004193 METCON_143 Max. frozen storage: 3 month
USA, 2004, Proctor, AR, (DP5634RR)	80 80	- 10	189 190	BBCH 79	Soya bean hay	7	1.9 1.5 (1.7)	0.37 0.31 (0.34)	2.3 1.8 (2.0)	204640 2004/5000755 RCN 2004194 METCON_143 Max. frozen storage: 2 month
USA, 2004, Stoneville, MS, (Pioneer 95B96)	80 80	- 10	188 189	BBCH 79	Soya bean hay	7	2.0 2.4 (2.2)	0.40 0.41 (0.41)	2.4 2.8 (2.6)	204640 2004/5000755 RCN 2004195 METCON_143 Max. frozen storage: 2 month
USA, 2004, Arkansaw, WI, (NK S20-G4)	80 80	- 10	188 189	BBCH 79	Soya bean hay	7	1.9 2.5 (2.2)	0.32 0.54 (0.43)	2.2 3.1 (2.6)	204640 2004/5000755 RCN 2004196 METCON_143 Max. frozen storage: 3 month
USA, 2004, Carlyle, IL, (BT–383CR)	80 80	- 10	100 95	BBCH 79	Soya bean hay	7	2.0 2.3 (2.2)	0.40 0.48 (0.44)	2.4 2.8 (2.6)	204640 2004/5000755 RCN 2004197 METCON_143 Max. frozen

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
										storage: 2 month

Additionally, a total of 15 field trials were conducted on soya bean in Canada and the USA during the 2005 growing season (White & Saha, 2006, METCON_144). Plants received 2 foliar applications of metconazole at nominal rates of 80 g ai/ha. Soya bean hay was harvested at 6–8 days after the last application. Additional samples from decline trials were collected at 0, 7, 14, and 20 days. Residues of *cis*- and *trans*-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0508. The limit of quantification for the sum of *cis*- and *trans*-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of < 20%.

Table 196 Residues of *cis*- and *trans*-metconazole in soya bean hay following foliar treatment (cGAP USA: 2×63 g ai/ha; 21 day PHI).

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
USA, 2005, Chula, GA, (Dekalb H7242RR)	80 80	- 10	176 180	BBCH 79	Soya bean hay	7	1.7 1.6 (1.7)	0.34 0.33 (0.33)	2.0 2.0 (2.0)	137726 2006/7006995 R05111 METCON_144 Max. frozen storage: 4.4 month
USA, 2005, Theilman, MN, (Asgrow AG1603)	80 80	- 10	189 187	BBCH 77	Soya bean hay	7	3.4 2.3 (2.9)	0.63 0.49 (0.56)	4.0 2.8 (3.4)	137726 2006/7006995 R05112 METCON_144 Max. frozen storage: 5.4 month
USA, 2005, Dumfries, MN, (Asgrow AG1603)	80 80	- 10	188 185	BBCH 77	Soya bean hay	7	3.2 3.4 (3.3)	0.67 0.61 (0.64)	3.9 4.0 (3.9)	137726 2006/7006995 R05113 METCON_144 Max. frozen storage: 5.4 month
USA, 2004, Grandfork, IL, (DKB38–52)	80 80	- 10	149 151	BBCH 79	Soya bean hay	7	1.1 1.2 (1.2)	0.20 0.23 (0.22)	1.3 1.4 (1.4)	137726 2006/7006995 R05114 METCON_144 Max. frozen storage: 5.1 month
USA, 2005, Carlyle, IL, (NK 43-B1)	80 80	- 11	175 184	BBCH 79	Soya bean hay	7	1.4 2.1 (1.8)	0.30 0.41 (0.35)	1.7 2.6 (2.1)	137726 2006/7006995 R05115 METCON_144 Max. frozen storage: 4.7 month
USA, 2005, Wyoming, IL, (Asgrow 3202)	80 80	- 11	176 175	BBCH 89	Soya bean hay	7	1.8 1.8 (1.8)	0.34 0.29 (0.31)	2.1 2.0 (2.1)	137726 2006/7006995 R05116

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
										METCON_144 Max. frozen storage: 5.0 month
USA, 2005, Osceola, NB, (Pioneer 92M80)	80 80	- 10	184 189	BBCH 77	Soya bean hay	7	1.6 2.2 (1.9)	0.33 0.50 (0.41)	1.9 2.7 (2.3)	137726 2006/7006995 R05117 METCON_144 Max. frozen storage: 5.9 month
USA, 2005, York, NB, (Pioneer 92M80)	80 80	- 9	187 187	BBCH 77	Soya bean hay	0 7 14 20	8.0 8.8 (8.4) 3.9 3.6 (3.8) 2.2 2.3 (2.3) 0.90 0.97 (0.94)	1.5 1.6 (1.6) 0.81 0.72 (0.77) 0.46 0.45 (0.46) 0.18 0.20 (0.19)	9.5 10 (10) 4.7 4.3 (4.5) 2.6 2.8 (2.7) 1.1 1.2 (1.1)	137726 2006/7006995 R05118 METCON_144 Max. frozen storage: 5.8 month
USA, 2005, Grand Island, NB, (Dyna-Gro 37B28RR)	80 80	- 10	184 187	BBCH 77	Soya bean hay	8	1.3 1.5 (1.4)	0.30 0.31 (0.30)	1.6 1.8 (1.7)	137726 2006/7006995 R05119 METCON_144 Max. frozen storage: 5.9 month
Canada, 2005, Branchton, ON (Mycogen 5140RR)	80 80	- 9	262 299	BBCH 77	Soya bean hay	7	2.6 2.7 (2.7)	0.49 0.57 (0.53)	3.1 3.2 (3.2)	137726 2006/7006995 R05120 METCON_144 Max. frozen storage: 5.6 month
USA, 2005, Wapello, IA, (Pioneer 93M11)	80 80	- 10	135 137	BBCH 75	Soya bean hay	6	2.4 2.4 (2.4)	0.55 0.55 (0.55)	2.9 3.0 (3.0)	137726 2006/7006995 R05121 METCON_144 Max. frozen storage: 5.1 month
USA, 2005, Jefferson, IA, (Pioneer 93B87)	80 80	- 9	138 131	BBCH 75	Soya bean hay	0 7 14 20	5.5 5.3 (5.4) 2.6 3.2 (2.9) 1.9 1.9 (1.9) 0.47 0.52 (0.50)	1.1 1.1 (1.1) 0.55 0.61 (0.58) 0.35 0.38 (0.36) 0.10 0.11 (0.10)	6.6 6.5 (6.6) 3.2 3.8 (3.5) 2.2 2.2 (2.2) 0.57 0.64 (0.60)	137726 2006/7006995 R05122 METCON_144 Max. frozen storage: 5.8 month
USA, 2005, Keokuk, IA, (DeKalb 3451)	80 80	- 10	138 142	BBCH 75	Soya bean hay	8	2.4 2.8 (2.6)	0.48 0.73 (0.61)	2.9 3.5 (3.2)	137726 2006/7006995 R05123 METCON_144

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
										Max. frozen storage: 5.0 month
USA, 2005, Conklin, MI, (Asgrow: AG1903)	80 80	- 10	192 191	BBCH 81	Soya bean hay	7	1.2 1.2 (1.2)	0.19 0.20 (0.19)	1.3 1.4 (1.4)	137726 2006/7006995 R05124 METCON_144 Max. frozen storage: 4.9 month
Canada, 2005, St-Pie-de-Bagot, QC, (26-02R RR)	80 80	- 11	228 215	BBCH 79	Soya bean hay	7	1.0 1.3 (1.1)	0.17 0.21 (0.19)	1.2 1.5 (1.3)	137726 2006/7006995 R05125 METCON_144 Max. frozen storage: 5.1 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 197 Residues of metabolites M11, M21 and M30 in soya bean hay following foliar treatment (cGAP USA: 2 × 63 g ai/ha; 21 day PHI).

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolite			
							M11	M21	M30	
USA, 2005, Chula, GA, (Dekalb H7242RR)	80 80	- 10	176 180	BBCH 79	Soya bean hay	7	0.06 0.06 (0.06)	0.04 0.03 (0.04)	0.02 0.02 (0.02)	137726 2006/7006995 R05111 METCON_144 Max. frozen storage: 4.4 month
USA, 2005, Theilman, MN, (Asgrow AG1603)	80 80	- 10	189 187	BBCH 77	Soya bean hay	7	0.07 0.06 (0.07)	0.06 0.04 (0.05)	0.02 0.02 (0.02)	137726 2006/7006995 R05112 METCON_144 Max. frozen storage: 5.4 month
USA, 2005, Dumfries, MN, (Asgrow AG1603)	80 80	- 10	188 185	BBCH 77	Soya bean hay	7	0.10 0.13 (0.12)	0.06 0.07 (0.07)	0.03 0.04 (0.04)	137726 2006/7006995 R05113 METCON_144 Max. frozen storage: 5.4 month
USA, 2004, Grandfork, IL, (DKB38–52)	80 80	- 10	149 151	BBCH 79	Soya bean hay	7	0.06 0.09 (0.08)	0.03 0.03 (0.03)	0.02 0.02 (0.02)	137726 2006/7006995 R05114 METCON_144 Max. frozen storage: 5.1 month
USA, 2005, Carlyle, IL, (NK 43-B1)	80 80	- 11	175 184	BBCH 79	Soya bean hay	7	0.04 0.07 (0.06)	0.03 0.04 (0.04)	0.02 0.03 (0.03)	137726 2006/7006995 R05115

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolite			
							M11	M21	M30	
										METCON_144 Max. frozen storage: 4.7 month
USA, 2005, Wyoming, IL, (Asgrow 3202)	80 80	- 11	176 175	BBCH 89	Soya bean hay	7	0.09 0.10 (0.10)	0.03 0.03 (0.03)	0.01 0.01 (0.01)	137726 2006/7006995 R05116 METCON_144 Max. frozen storage: 5.0 month
USA, 2005, Osceola, NB, (Pioneer 92M80)	80 80	- 10	184 189	BBCH 77	Soya bean hay	7	0.02 0.02 (0.02)	0.02 0.02 (0.02)	0.01 0.02 (0.02)	137726 2006/7006995 R05117 METCON_144 Max. frozen storage: 5.9 month
USA, 2005, York, NB, (Pioneer 92M80)	80 80	- 9	187 187	BBCH 77	Soya bean hay	0 7 14 20	0.07 0.08 (0.08) 0.08 0.08 (0.08) 0.05 0.05 (0.05) 0.03 0.03 (0.03)	0.05 0.05 (0.05) 0.05 0.05 (0.05) 0.04 0.04 (0.04) 0.02 0.02 (0.02)	0.02 0.03 (0.03) 0.03 0.03 (0.03) 0.02 0.02 (0.02) < 0.01 0.01 (0.01)	137726 2006/7006995 R05118 METCON_144 Max. frozen storage: 5.8 month
USA, 2005, Grand Island, NB, (Dyna-Gro 37B28RR)	80 80	- 10	184 187	BBCH 77	Soya bean hay	8	0.03 0.04 (0.04)	0.02 0.03 (0.03)	0.01 0.02 (0.02)	137726 2006/7006995 R05119 METCON_144 Max. frozen storage: 5.9 month
Canada, 2005, Branchton, ON (Mycogen 5140RR)	80 80	- 9	262 299	BBCH 77	Soya bean hay	7	0.20 0.19 (0.20)	0.07 0.08 (0.08)	0.03 0.04 (0.04)	137726 2006/7006995 R05120 METCON_144 Max. frozen storage: 5.6 month
USA, 2005, Wapello, IA, (Pioneer 93M11)	80 80	- 10	135 137	BBCH 75	Soya bean hay	6	0.06 0.06 (0.06)	0.04 0.04 (0.04)	0.02 0.02 (0.02)	137726 2006/7006995 R05121 METCON_144 Max. frozen storage: 5.1 month
USA, 2005, Jefferson, IA, (Pioneer 93B87)	80 80	- 9	138 131	BBCH 75	Soya bean hay	0 7 14	0.11 0.09 (0.10) 0.07 0.08 (0.08) 0.10 0.10 (0.10)	0.05 0.04 (0.05) 0.05 0.05 (0.05) 0.05 0.05 (0.05)	0.03 0.02 (0.03) 0.02 0.03 (0.03) 0.03 0.03 (0.03)	137726 2006/7006995 R05122 METCON_144 Max. frozen storage: 5.8 month

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolite			
							M11	M21	M30	
						20	0.02 0.02 (0.02)	0.01 0.01 (0.01)	< 0.01 < 0.01 (< 0.01)	
USA, 2005, Keokuk, IA, (DeKalb 3451)	80 80	- 10	138 142	BBCH 75	Soya bean hay	8	0.04 0.04 (0.04)	0.03 0.04 (0.04)	0.02 0.02 (0.02)	137726 2006/7006995 R05123 METCON_144 Max. frozen storage: 5.0 month
USA, 2005, Conklin, MI, (Asgrow: AG1903)	80 80	- 10	192 191	BBCH 81	Soya bean hay	7	0.05 0.06 (0.06)	0.02 0.02 (0.02)	0.01 0.01 (0.01)	137726 2006/7006995 R05124 METCON_144 Max. frozen storage: 4.9 month
Canada, 2005, St-Pie-de-Bagot, QC, (26-02RRR)	80 80	- 11	228 215	BBCH 79	Soya bean hay	7	0.02 0.02 (0.02)	0.01 0.01 (0.01)	< 0.01 < 0.01 (< 0.01)	137726 2006/7006995 R05125 METCON_144 Max. frozen storage: 5.1 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 198 Residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), and triazolyl acetic acid (TAA) in soya bean hay following foliar treatment (cGAP USA: 2×63 g ai/ha; 21 day PHI).

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolite			
							T	TA	TAA	
USA, 2005, Chula, GA, (Dekalb H7242RR)	80 80	- 10	176 180	BBCH 79	Soya bean hay	7	< 0.05 0.053 (0.052)	0.08 0.07 (0.08)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05111 METCON_144 Max. frozen storage: 3.9 month
USA, 2005, Theilman, MN, (Asgrow AG1603)	80 80	- 10	189 187	BBCH 77	Soya bean hay	7	0.052 0.061 (0.06)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05112 METCON_144 Max. frozen storage: 4.9 month
USA, 2005, Dumfries, MN, (Asgrow AG1603)	80 80	- 10	188 185	BBCH 77	Soya bean hay	7	< 0.05 0.081 (0.066)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05113 METCON_144 Max. frozen storage: 4.9 month
USA, 2004, Grandfork, IL,	80 80	- 10	149 151	BBCH 79	Soya bean hay	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05114

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolite			
							T	TA	TAA	
(DKB38–52)										METCON_144 Max. frozen storage: 4.6 month
USA, 2005, Carlyle, IL, (NK 43-B1)	80 80	- 11	175 184	BBCH 79	Soya bean hay	7	0.078 0.076 (0.077)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05115 METCON_144 Max. frozen storage: 4.2 month
USA, 2005, Wyoming, IL, (Asgrow 3202)	80 80	- 11	176 175	BBCH 89	Soya bean hay	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05116 METCON_144 Max. frozen storage: 5.0 month
USA, 2005, Osceola, NB, (Pioneer 92M80)	80 80	- 10	184 189	BBCH 77	Soya bean hay	7	0.066 0.080 (0.073)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05117 METCON_144 Max. frozen storage: 5.4 month
USA, 2005, York, NB, (Pioneer 92M80)	80 80	- 9	187 187	BBCH 77	Soya bean hay	0 7 14 20	< 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05118 METCON_144 Max. frozen storage: 5.9 month
USA, 2005, Grand Island, NB, (Dyna-Gro 37B28RR)	80 80	- 10	184 187	BBCH 77	Soya bean hay	8	0.072 0.060 (0.066)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05119 METCON_144 Max. frozen storage: 5.4 month
Canada, 2005, Branchton, ON (Mycogen 5140RR)	80 80	- 9	262 299	BBCH 77	Soya bean hay	7	0.075 0.084 (0.080)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05120 METCON_144 Max. frozen storage: 5.1 month
USA, 2005, Wapello, IA, (Pioneer 93M11)	80 80	- 10	135 137	BBCH 75	Soya bean hay	6	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05121 METCON_144 Max. frozen storage: 5.1 month
USA, 2005, Jefferson,	80 80	- 9	138 131	BBCH 75	Soya bean	0	< 0.05 < 0.05	< 0.05 < 0.05	< 0.05 < 0.05	137726 2006/7006995

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolite			
							T	TA	TAA	
IA, (Pioneer 93B87)					hay	7 14 20	(< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05)	(< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05)	(< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05) < 0.05 < 0.05 (< 0.05)	R05122 METCON_144 Max. frozen storage: 5.8 month
USA, 2005, Keokuk, IA, (DeKalb 3451)	80 80	- 10	138 142	BBCH 75	Soya bean hay	8	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05123 METCON_144 Max. frozen storage: 5.0 month
USA, 2005, Conklin, MI, (Asgrow: AG1903)	80 80	- 10	192 191	BBCH 81	Soya bean hay	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05124 METCON_144 Max. frozen storage: 4.9 month
Canada, 2005, St-Pie-de-Bagot, QC, (26-02R RR)	80 80	- 11	228 215	BBCH 79	Soya bean hay	7	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	137726 2006/7006995 R05125 METCON_144 Max. frozen storage: 5.1 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Sugar beet tops

A total of 12 field trials were conducted on sugar beet in the USA during the 2005 growing season (Jordan & Saha, 2006, METCON_147). Plants received 2 foliar applications of metconazole at nominal rates of 110–120 g ai/ha or 160–170 g ai/ha. Sugar beet tops were harvested at 13–15 days after the last application. Additional samples from decline trials were collected at 1, 7, 14–15, 21, and 27–28 days. Residues of cis- and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0508. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of < 20%.

Residues of metabolites 1,2,4-triazole, triazolyl alanine and triazolyl acetic acid were each below their LOQs of 0.05 mg/kg mg/kg in all trials.

Table 199 Residues of *cis*- and *trans*-metconazole in sugar beet tops following foliar treatment (cGAP Canada: 2 × 113 g ai/ha; 14 days PHI).

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
USA, 2005, Dumfries, MN, (VDH66556 8232 Medium)	114 113	- 14	189 190	Crop cover complete	Tops	14	1.0 1.0 (1.0)	0.17 0.18 (0.18)	1.2 1.2 (1.2)	137714 2006/7006726 RCN R05085 METCON_147 Max. frozen storage: 5.8 month
	170 168	- 14	188 189	Crop cover complete	Tops	14	1.7 2.1 (1.9)	0.34 0.43 (0.38)	2.0 2.5 (2.3)	
USA, 2005, Theilman, MN, (VDH66556 8232 Medium)	113 111	- 14	188 188	Crop cover complete	Tops	14	0.87 0.93 (0.90)	0.15 0.15 (0.15)	1.0 1.1 (1.0)	137714 2006/7006726 RCN R05086 METCON_147 Max. frozen storage: 5.8 month
	170 168	- 14	188 189	Crop cover complete	Tops	14	0.81 0.93 (0.87)	0.13 0.15 (0.14)	0.94 1.1 (1.0)	
USA, 2005, Arkansaw, WI, (VDH66556 8232 Medium)	110 112	- 15	187 187	Crop cover complete	Tops	1 7 14 21 28	1.9 2.3 (2.1) 1.4 1.3 (1.4) 0.72 1.1 (0.89) 0.79 0.74 (0.77) 0.82 0.51 (0.66)	0.33 0.40 (0.36) 0.25 0.25 (0.25) 0.11 0.15 (0.13) 0.11 0.11 (0.11) 0.10 0.059 (0.08)	2.2 2.7 (2.4) 1.6 1.5 (1.6) 0.84 1.2 (1.0) 0.91 0.85 (0.88) 0.92 0.57 (0.74)	137714 2006/7006726 RCN R05087 METCON_147 Max. frozen storage: 6.5 month
	168 169	- 15	189 188	Crop cover complete	Tops	1 7 14 21 28	2.9 2.5 (2.7) 2.4 2.8 (2.6) 1.6 1.8 (1.7) 1.5 1.3 (1.4) 0.72 1.2 (0.94)	0.52 0.47 (0.49) 0.41 0.49 (0.45) 0.22 0.32 (0.27) 0.19 0.15 (0.17) 0.11 0.15 (0.13)	3.4 2.9 (3.2) 2.8 3.3 (3.0) 1.8 2.1 (2.0) 1.7 1.4 (1.5) 0.82 1.3 (1.1)	
USA, 2005, Fitchburg, WI, (VanderhaveVDH 66556) [b]	113 112	- 15	209 226	Crop cover complete	Tops	13	0.014 0.015 (0.015)	0.12 0.14 (0.13)	0.13 0.15 (0.14)	137714 2006/7006726 RCN R05088 METCON_147 Max. frozen storage: 5.5 month
	167 164	- 15	207 220	Crop cover complete	Tops	13	0.030 0.026 (0.028)	0.005 0.20 (0.10)	0.035 0.23 (0.13)	
USA, 2005, Fitchburg, WI, (VanderhaveVDH 66556) [b]	113 114	- 13	220 217	Crop cover complete	Tops	14	0.034 0.031 (0.03)	0.006 0.006 (0.01)	0.04 0.037 (0.04)	137714 2006/7006726 RCN R05089 METCON_147 Max. frozen storage: 5.5 month
	166 163	- 13	217 204	Crop cover complete	Tops	14	0.05 0.06 (0.06)	0.01 0.011 (0.01)	0.06 0.071 (0.07)	
USA, 2005, Eldridge, ND, (66453)	114 113	- 13	186 183	Root harvestable size	Tops	14	0.021 0.055 (0.04)	0.16 0.011 (0.09)	0.19 0.066 (0.13)	137714 2006/7006726 RCN R05090 METCON_147 Max. frozen storage: 6.0 month
	175 172	- 13	190 185	Root harvestable size	Tops	14	0.057 0.024 (0.04)	0.011 0.19 (0.10)	0.068 0.22 (0.14)	

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metconazole			
							cis-	*trans*-	Total	
USA, 2005, Levelland, TX, (Eagle R)	112 113	- 13	190 188	Canopy 80% closed	Tops	14	0.01 0.01 (0.01)	0.079 0.082 (0.08)	0.089 0.092 (0.09)	137714 2006/7006726 RCN R05091 METCON_147 Max. frozen storage: 5.5 month
	168 170	- 13	188 189	Canopy 80% closed	Tops	14	0.019 0.018 (0.02)	0.144 0.151 (0.15)	0.162 0.17 (0.17)	
USA, 2005, Pavillion, MT, (Treasure)	171 168	- 14	171 168	Fully mature	Tops	14	0.014 0.017 (0.02)	0.132 0.133 (0.13)	0.146 0.15 (0.15)	137714 2006/7006726 RCN R05092 METCON_147 Max. frozen storage: 6.0 month
	158 172	- 14	156 172	Fully mature	Tops	14	0.043 0.042 (0.04)	0.008 0.008 (0.01)	0.052 0.05 (0.05)	
USA, 2005, Hughson, CA, (Unknown)	113 114	- 14	236 238	Crop cover complete	Tops	14	0.012 0.014 (0.01)	0.098 0.096 (0.10)	0.11 0.109 (0.11)	137714 2006/7006726 RCN R05093 METCON_147 Max. frozen storage: 6.0 month
	169 169	- 14	235 235	Crop cover complete	Tops	14	0.019 0.021 (0.02)	0.164 0.171 (0.17)	0.183 0.193 (0.19)	
USA, 2005, Hickamn, CA, (Unknown)	112 109	- 14	234 228	Crop cover complete	Tops	14	0.495 0.522 (0.51)	0.068 0.075 (0.07)	0.564 0.597 (0.58)	137714 2006/7006726 RCN R05094 METCON_147 Max. frozen storage: 6.2 month
	171 165	- 14	238 230	Crop cover complete	Tops	14	0.985 0.956 (0.97)	0.145 0.142 (0.14)	1.13 1.099 (1.11)	
USA, 2005, Payette, ID, (HM WS91)	114 111	- 14	286 278	Root harvestable size	Tops	1	0.026 0.028 (0.03)	< 0.005 < 0.005 (< 0.005)	0.031 0.033 (0.03)	137714 2006/7006726 RCN R05095 METCON_147 Max. frozen storage: 6.3 month
						7	0.021 0.02 (0.02)	0.176 0.176 (0.18)	0.197 0.196 (0.20)	
						15	0.015 0.012 (0.01)	0.109 0.095 (0.10)	0.124 0.107 (0.12)	
						21	0.008 0.011 (0.01)	< 0.005 0.107 (0.08)	0.013 0.118 (0.09)	
						27	0.007 0.011 (0.01)	0.073 0.082 (0.08)	0.081 0.093 (0.09)	
	166 164	- 14	278 274	Root harvestable size	Tops	1	0.035 0.034 (0.03)	0.006 0.006 (0.01)	0.041 0.041 (0.04)	
						7	0.026 0.029 (0.03)	< 0.005 0.201 (0.20)	0.031 0.23 (0.13)	
						15	0.014 0.017 (0.02)	0.135 0.137 (0.14)	0.149 0.154 (0.15)	
						21	0.017 0.02 (0.02)	0.132 0.174 (0.15)	0.149 0.194 (0.17)	
						27	0.016 0.013 (0.01)	0.13 0.098 (0.11)	0.146 0.111 (0.13)	
USA, 2005, Jerome, ID, (Beta 8422)	113 111	- 14	177 180	Root harvestable size	Tops	14	0.783 0.868 (0.83)	0.116 0.164 (0.14)	0.899 1.032 (0.97)	137714 2006/7006726 RCN R05096 METCON_147 Max. frozen storage: 6.1 month
	171 169	- 14	178 196	Root harvestable size	Tops	14	1.812 1.471 (1.64)	0.262 0.218 (0.24)	2.074 1.689 (1.88)	

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] It was noted that trial RCN R05088 and RCN R05089 were performed at the same location and year and therefore could not be considered as independent.

Table 200 Residues of metabolites M11, M21 and M30 in sugar beet tops following foliar treatment (cGAP Canada: 2×113 g ai/ha; 14 days PHI).

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolites			
							M11	M21	M30	
USA, 2005, Dumfries, MN, (VDH66556 8232 Medium)	114 113	- 14	189 190	Crop cover complete	Tops	14	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006726 RCN R05085 METCON_147 Max. frozen storage: 5.8 month
	170 168	- 14	188 189	Crop cover complete	Tops	14	< 0.01 < 0.01 (< 0.01)	0.01 0.02 (0.02)	< 0.01 < 0.01 (< 0.01)	
USA, 2005, Theilman, MN, (VDH66556 8232 Medium)	113 111	- 14	188 188	Crop cover complete	Tops	14	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006726 RCN R05086 METCON_147 Max. frozen storage: 5.8 month
	170 168	- 14	188 189	Crop cover complete	Tops	14	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	
USA, 2005, Arkansaw, WI, (VDH66556 8232 Medium)	110 112	- 15	187 187	Crop cover complete	Tops	1 7 14 21 28	< 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01)	< 0.01 0.01 (0.01) 0.01 0.01 (< 0.01) < 0.01 0.01 (< 0.01) < 0.01 0.01 (< 0.01) 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01)	137714 2006/7006726 RCN R05087 METCON_147 Max. frozen storage: 6.5 month
	168 169	- 15	189 188	Crop cover complete	Tops	1 7 14 21 28	< 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01)	0.01 0.01 (< 0.01) 0.01 0.02 (< 0.01) 0.02 0.02 (< 0.01) 0.01 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01)	
USA, 2005, Fitchburg, WI, (VanderhaveVDH 66556)	113 112	- 15	209 226	Crop cover complete	Tops	13	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006726 RCN R05088 METCON_147 Max. frozen storage: 5.5 month
	167 164	- 15	207 220	Crop cover complete	Tops	13	< 0.01 < 0.01 (< 0.01)	0.01 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolites			
							M11	M21	M30	
USA, 2005, Fitchburg, WI, (VanderhaveVDH 66556)	113 114	- 13	220 217	Crop cover complete	Tops	14	< 0.01 < 0.01 (< 0.01)	0.01 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006726 RCN R05089 METCON_147 Max. frozen storage: 5.5 month
	166 163	- 13	217 204	Crop cover complete	Tops	14	< 0.01 < 0.01 (< 0.01)	0.01 0.02 (0.02)	< 0.01 < 0.01 (< 0.01)	
USA, 2005, Eldridge, ND, (66453)	114 113	- 13	186 183	Root harvestable size	Tops	14	< 0.01 0.01 (0.01)	< 0.01 0.02 (0.02)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006726 RCN R05090 METCON_147 Max. frozen storage: 6.0 month
	175 172	- 13	190 185	Root harvestable size	Tops	14	0.02 < 0.01 (0.02)	0.02 < 0.01 (0.02)	< 0.01 < 0.01 (< 0.01)	
USA, 2005, Levelland, TX, (Eagle R)	112 113	- 13	190 188	Canopy 80% closed	Tops	14	0.01 < 0.01 (0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006726 RCN R05091 METCON_147 Max. frozen storage: 5.5 month
	168 170	- 13	188 189	Canopy 80% closed	Tops	14	0.02 0.02 (0.02)	0.02 0.01 (0.02)	< 0.01 < 0.01 (< 0.01)	
USA, 2005, Pavillion, MT, (Treasure)	171 168	- 14	171 168	Fully mature	Tops	14	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006726 RCN R05092 METCON_147 Max. frozen storage: 6.0 month
	158 172	- 14	156 172	Fully mature	Tops	14	< 0.01 < 0.01 (< 0.01)	0.02 0.02 (< 0.01)	< 0.01 < 0.01 (< 0.01)	
USA, 2005, Hughson, CA, (Unknown)	113 114	- 14	236 238	Crop cover complete	Tops	14	0.01 0.02 (0.02)	0.01 0.01 (0.01)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006726 RCN R05093 METCON_147 Max. frozen storage: 6.0 month
	169 169	- 14	235 235	Crop cover complete	Tops	14	0.03 0.02 (0.03)	0.02 0.02 (0.02)	< 0.01 < 0.01 (< 0.01)	
USA, 2005, Hickamn, CA, (Unknown)	112 109	- 14	234 228	Crop cover complete	Tops	14	0.02 0.02 (0.02)	< 0.01 0.01 (0.01)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006726 RCN R05094 METCON_147 Max. frozen storage: 6.2 month
	171 165	- 14	238 230	Crop cover complete	Tops	14	0.03 0.02 (0.03)	0.02 0.02 (0.02)	< 0.01 < 0.01 (< 0.01)	
USA, 2005, Payette, ID, (HM WS91)	114 111	- 14	286 278	Root harvestable size	Tops	1 7 15 21 27	< 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01)	137714 2006/7006726 RCN R05095 METCON_147 Max. frozen storage: 6.3 month
	166 164	- 14	278 274	Root harvestable size	Tops	1 7	< 0.01 < 0.01 (< 0.01) < 0.01	< 0.01 < 0.01 (< 0.01) 0.01	< 0.01 < 0.01 (< 0.01) < 0.01	

Location, Year (variety)	Application				Residues (mg/kg) [a]					Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	Sample	DALA	Metabolites			
							M11	M21	M30	
						15 21 27	< 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) 0.01 0.01 (0.01) 0.01 < 0.01 (0.01)	< 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01)	< 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01)	
USA, 2005, Jerome, ID, (Beta 8422)	113 111	- 14	177 180	Root harvestable size	Tops	14	< 0.01 0.01 (0.01)	< 0.01 0.01 (0.01)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006726 RCN R05096 METCON_147 Max. frozen storage: 6.1 month
	171 169	- 14	178 196	Root harvestable size	Tops	14	0.02 0.01 (0.02)	0.02 0.02 (0.02)	< 0.01 < 0.01 (< 0.01)	

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Wheat hay

A total of 15 field trials were conducted on wheat in Canada and the USA during the 2004-05 growing seasons (White & Saha, 2006, METCON_152). Plants received 2 foliar applications of metconazole at nominal rates of 89–112 g ai/ha. Wheat hay was harvested at 6–8 days after the last application and left to dry on the field or a sheltered location for up to 14 days. Additional samples from a decline trial were collected at 0, 7–8 and 14 days. Residues of cis- and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0508. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of < 20%.

Table 201 Residues of *cis*- and *trans*-metconazole in wheat hay following foliar treatment (cGAP USA: 2 × 112 g ai/ha; 30 days PHI).

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				Metconazole		Total	
							cis	*trans*		
USA, 2005, Sunsweet, GA (Pioneer 26R24)	2 × 0.11	8	171 162	39	7	Hay	3.2 3.8 (3.5)	0.63 0.74 (0.68)	3.8 4.5 (4.2)	137711 2006/7006723 RCN R05044 METCON_152 Max. frozen storage: 8.3 month
USA, 2005, Newport, AK (Genesis R033)	2 × 0.11	7	189 187	65	7	Hay	5.1 5.4 (5.3)	0.87 0.94 (0.90)	6.0 6.4 (6.2)	137711 2006/7006723 RCN R05045 METCON_152 Max. frozen storage: 7.6 month
USA, 2005, York, NE, (Millenium)	2 × 0.11	7	185 186	69	8	Hay	1.2 1.2 (1.2)	0.17 0.18 (0.17)	1.3 1.4 (1.4)	137711 2006/7006723 RCN R05046 METCON_152 Max. frozen

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2005, Carlyle, IL, (Excel 201)	2 × 0.11	7	133 152	65 mature	0 7 14	Hay Hay Hay	9.0 9.9 (9.4) 6.7 5.6 (6.2) 4.9 3.8 (4.4)	1.5 1.5 (1.5) 1.2 1.0 (1.1) 0.82 0.82 (0.82)	10.5 11.3 (10.9) 7.9 6.7 (7.3) 5.8 4.6 (5.2)	137711 2006/7006723 RCN R05047 METCON_152 Max. frozen storage: 7.2 month
USA, 2005, Grand Island, NE (Jagalene HRW)	2 × 0.11	8	185 181	69	7	Hay	1.8 1.5 (1.7)	0.36 0.31 (0.33)	2.2 1.8 (2.0)	137711 2006/7006723 RCN R05048 METCON_152 Max. frozen storage: 6.5 month
USA, 2005, Velva, ND (Dapps)	2 × 0.11	7	113 114	65	8	Hay	4.1 5.9 (5.0)	0.74 1.1 (0.92)	4.8 7.0 (5.9)	137711 2006/7006723 RCN R05049 METCON_152 Max. frozen storage: 5.8 month
USA, 2005, Gardner, ND (Knudson)	1 × 0.12 1 × 0.11	6	153 150	73	0 8 14	Hay Hay Hay	10.0 10.3 (10.2) 5.1 5.2 (5.1) 3.2 3.5 (3.3)	1.8 1.6 (1.7) 0.87 0.94 (0.90) 0.59 0.64 (0.62)	11.8 11.9 (11.8) 5.9 6.1 (6.0) 3.8 4.1 (3.9)	137711 2006/7006723 RCN R05050 METCON_152 Max. frozen storage: 5.3 month
USA, 2005, Hinton, OK (Jagalene)	2 × 0.11	8	126 129	71	7	Hay	6.7 5.7 (6.2)	1.1 1.0 (1.1)	7.9 6.7 (7.3)	137711 2006/7006723 RCN R05051 METCON_152 Max. frozen storage: 7.4 month
USA, 2005, Colony, OK (Jagger)	2 × 0.11	6	125 129	77	6	Hay	8.5 8.1 (8.3)	1.4 1.4 (1.4)	9.9 9.5 (9.7)	137711 2006/7006723 RCN R05052 METCON_152 Max. frozen storage: 7.4 month
USA, 2005, Lubbock, TX (TAM 200)	2 × 0.11	6	141 140	59	7	Hay	8.4 9.5 (9.0)	1.6 1.7 (1.7)	10.1 11.2 (11)	137711 2006/7006723 RCN R05053 METCON_152 Max. frozen storage: 7.6 month
USA, 2005, Payette, ID (Penawawa)	1 × 0.12 1 × 0.11	7	284 283	65	7	Hay	4.9 5.3 (5.1)	0.92 0.74 (0.83)	5.8 6.0 (5.9)	137711 2006/7006723 RCN R05054 METCON_152 Max. frozen

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
										storage: 6.3 month
Canada, 2005, Laird, SK (Bounty)	2 × 0.11	7	139 134	65	7	Hay	11.0 10.9 (10.9)	1.7 1.6 (1.6)	12.7 12.5 (13)	137711 2006/7006723 RCN R05055 METCON_152 Max. frozen storage: 4.9 month
Canada, 2005, Minto, MB (AC Barrie)	2 × 0.11	7	199 200	71	7	Hay	5.5 5.2 (5.4)	0.96 0.82 (0.89)	6.5 6.1 (6.3)	137711 2006/7006723 RCN R05056 METCON_152 Max. frozen storage: 5.6 month
Canada, 2005, Innisfail, AB (AC Intrepid)	2 × 0.11	7	243 245	61	7	Hay	4.8 4.7 (4.7)	0.74 0.84 (0.80)	5.5 5.5 (5.5)	137711 2006/7006723 RCN R05057 METCON_152 Max. frozen storage: 5.2 month
Canada, 2005, Innisfail, AB (5700PR)	2 × 0.11	7	241 226	65	7	Hay	5.5 6.0 (5.7)	1.0 0.82 (0.92)	6.5 6.8 (6.7)	137711 2006/7006723 RCN R05058 METCON_152 Max. frozen storage: 5.2 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 202 Residues of metabolites M11, M21 and M30 in wheat hay following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
USA, 2005, Sunsweet, GA (Pioneer 26R24)	2 × 0.11	8	171 162	39	7	Hay	0.020 0.020 (0.020)	0.040 0.050 (0.040)	< 0.01 < 0.01 (< 0.01)	137711 2006/7006723 RCN R05044 METCON_152 Max. frozen storage: 8.3 month
USA, 2005, Newport, AK (Genesis R033)	2 × 0.11	7	189 187	65	7	Hay	0.050 0.050 (0.050)	0.060 0.060 (0.060)	0.010 0.010 (0.010)	137711 2006/7006723 RCN R05045 METCON_152 Max. frozen storage: 7.6 month
USA, 2005, York, NE, (Millenium)	2 × 0.11	7	185 186	69	8	Hay	0.13 0.13 (0.13)	0.080 0.090 (0.085)	0.040 0.030 (0.035)	137711 2006/7006723 RCN R05046 METCON_152 Max. frozen storage: 6.4 month

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
USA, 2005, Carlyle, IL, (Excel 201)	2 × 0.11	7	133 152	65 mature	0 7 14	Hay Hay Hay	0.030 0.030 (0.030) 0.050 0.030 (0.040) 0.060 0.050 (0.055)	0.060 0.050 (0.055) 0.070 0.060 (0.065) 0.070 0.070 (0.070)	< 0.01 < 0.01 (< 0.01) 0.010 0.010 (0.010) 0.020 0.010 (0.015)	137711 2006/7006723 RCN R05047 METCON_152 Max. frozen storage: 7.2 month
USA, 2005, Grand Island, NE (Jagalene HRW)	2 × 0.11	8	185 181	69	7	Hay	0.020 0.020 (0.020)	0.030 0.030 (0.030)	< 0.01 < 0.01 (< 0.01)	137711 2006/7006723 RCN R05048 METCON_152 Max. frozen storage: 6.5 month
USA, 2005, Velva, ND (Dapps)	2 × 0.11	7	113 114	65	8	Hay	< 0.01 0.010 (0.010)	0.040 0.050 (0.045)	< 0.01 < 0.01 (< 0.01)	137711 2006/7006723 RCN R05049 METCON_152 Max. frozen storage: 5.8 month
USA, 2005, Gardner, ND (Knudson)	1 × 0.12 1 × 0.11	6	153 150	73	0 8 14	Hay Hay Hay	0.040 0.040 (0.040) 0.36 0.37 (0.37) 0.09 0.10 (0.095)	0.070 0.060 (0.065) 0.13 0.13 (0.13) 0.080 0.080 (0.080)	0.010 0.010 (0.010) 0.050 0.040 (0.045) 0.020 0.020 (0.020)	137711 2006/7006723 RCN R05050 METCON_152 Max. frozen storage: 5.3 month
USA, 2005, Hinton, OK (Jagalene)	2 × 0.11	8	126 129	71	7	Hay	0.13 0.14 (0.14)	0.17 0.17 (0.17)	0.040 0.040 (0.04)	137711 2006/7006723 RCN R05051 METCON_152 Max. frozen storage: 7.4 month
USA, 2005, Colony, OK (Jagger)	2 × 0.11	6	125 129	77	6	Hay	0.090 0.080 (0.09)	0.12 0.11 (0.12)	0.020 0.020 (0.020)	137711 2006/7006723 RCN R05052 METCON_152 Max. frozen storage: 7.4 month
USA, 2005, Lubbock, TX (TAM 200)	2 × 0.11	6	141 140	59	7	Hay	0.070 0.070 (0.070)	0.080 0.070 (0.075)	0.020 0.020 (0.020)	137711 2006/7006723 RCN R05053 METCON_152 Max. frozen storage: 7.6 month
USA, 2005, Payette, ID (Penawawa)	1 × 0.12 1 × 0.11	7	284 283	65	7	Hay	0.030 0.030 (0.030)	0.080 0.080 (0.080)	0.010 0.010 (0.010)	137711 2006/7006723 RCN R05054 METCON_152 Max. frozen storage: 6.3 month

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
Canada, 2005, Laird, SK (Bounty)	2 × 0.11	7	139 134	65	7	Hay	0.030 0.030 (0.030)	0.080 0.080 (0.080)	0.020 0.020 (0.020)	137711 2006/7006723 RCN R05055 METCON_152 Max. frozen storage: 4.9 month
Canada, 2005, Minto, MB (AC Barrie)	2 × 0.11	7	199 200	71	7	Hay	0.060 0.050 (0.060)	0.080 0.080 (0.080)	0.020 0.020 (0.020)	137711 2006/7006723 RCN R05056 METCON_152 Max. frozen storage: 5.6 month
Canada, 2005, Innisfail, AB (AC Intrepid)	2 × 0.11	7	243 245	61	7	Hay	0.11 0.13 (0.12)	0.13 0.13 (0.13)	0.030 0.030 (0.030)	137711 2006/7006723 RCN R05057 METCON_152 Max. frozen storage: 5.2 month
Canada, 2005, Innisfail, AB (5700PR)	2 × 0.11	7	241 226	65	7	Hay	0.19 0.48 (0.34)	0.16 0.19 (0.18)	0.040 0.060 (0.050)	137711 2006/7006723 RCN R05058 METCON_152 Max. frozen storage: 5.2 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] Residues of metabolites M11, M21 and M30 are expressed as parent equivalent (conversion factors 0.95, 0.95 and 0.96, respectively). For calculations, 0.01 mg/kg was used for residues below or at the LOQ for metabolites M11, M21 and M30.

Barley hay

A total of 12 field trials were conducted on barley in the USA during the 2004-05 growing seasons (White & Saha, 2006, METCON_148). Plants received 2 foliar applications of metconazole at nominal rates of 112–123 g ai/ha. Barley hay was harvested at 7–8 days after the last application and left to dry on the field for up to 14 days. Additional samples from a decline trial were collected at 0, 7 and 14 days. Residues of cis- and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0508. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of < 20%, except for *cis*-metconazole in hay spiked at 0.5 mg/kg which had an RSD of 21%.

Table 203 Residues of cis- and trans-metconazole in barley hay following foliar treatment (cGAP USA: 2 × 112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2005, North Rose, NY (Chapais)	2 × 0.12	7	236 237	85	7	Hay	2.5 2.7 (2.6)	0.39 0.49 (0.44)	2.9 3.2 (3.0)	137714 2006/7006917 RCN R05155 METCON_148 Max. frozen storage: 6.0

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period month
USA, 2005, Belleville, IL (Not stated)	2 × 0.11	7	138 153	85 69	0 7 14	Hay	9.40 9.38 (9.39) 2.3 2.5 (2.4) 1.34 1.25 (1.3)	1.57 1.54 (1.55) 0.41 0.50 (0.5) 0.22 0.22 (0.22)	10.9 10.9 (10.9) 2.7 2.9 (2.8) 1.6 1.5 (1.5)	137714 2006/7006917 RCN R05156 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, York, NB (Robust Barley)	2 × 0.11	7	188 185	85	7	Hay	0.73 0.64 (0.68)	0.13 0.09 (0.11)	0.86 0.73 (0.79)	137714 2006/7006917 RCN R05157 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Velva, ND (Excel)	2 × 0.11	7	112 113	85	8	Hay	0.76 1.3 (1.0)	0.12 0.18 (0.15)	0.88 1.5 (1.2)	137714 2006/7006917 RCN R05158 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Grand Island, NB (Robust Barley)	2 × 0.11	7	181 187	85	7	Hay	0.68 0.76 (0.72)	0.11 0.09 (0.10)	0.79 0.85 (0.82)	137714 2006/7006917 RCN R05159 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Young Ward, UT (Baroness)	2 × 0.11	7	176 178	87	7	Hay	1.9 1.7 (1.8)	0.33 0.37 (0.35)	2.2 2.1 (2.2)	137714 2006/7006917 RCN R05160 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Madera, CA, UT (Farmers Best)	2 × 0.11	7	281 281	87	7	Hay	2.6 2.8 (2.7)	0.58 0.50 (0.54)	3.2 3.3 (3.2)	137714 2006/7006917 RCN R05161 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Payette, ID (Baronesse)	2 × 0.11	7	284 279	87	7	Hay	2.6 2.7 (2.6)	0.48 0.57 (0.52)	3.0 3.3 (3.2)	137714 2006/7006917 RCN R05162 METCON_148 Max. frozen storage: 6.0 month
Canada, 2005, Rosthern, SK (AC Metcalfe)	2 × 0.11	7	201 196	85	7	Hay	3.3 3.6 (3.5)	0.52 0.72 (0.62)	3.8 4.4 (4.1)	137714 2006/7006917 RCN R05163 METCON_148 Max. frozen storage: 6.0

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period month
Canada, 2005, Minto, MB (AC Metcalfe)	2 × 0.11	7	206 207	87	7	Hay	2.6 2.75 (2.7)	0.44 0.50 (0.47)	3.0 3.3 (3.1)	137714 2006/7006917 RCN R05164 METCON_148 Max. frozen storage: 6.0 month
Canada, 2005, Innisfail, AB (CDC Bold)	2 × 0.11	7	244 243	85	7	Hay	2.8 3.1 (3.0)	0.53 0.66 (0.59)	3.3 3.8 (3.6)	137714 2006/7006917 RCN R05165 METCON_148 Max. frozen storage: 6.0 month
Canada, 2005, Innisfail, AB (CDC Bold)	2 × 0.11	7	248 230	87	7	Hay	3.7 3.7 (3.7)	0.74 0.63 (0.68)	4.4 4.3 (4.4)	137714 2006/7006917 RCN R05166 METCON_148 Max. frozen storage: 6.0 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 204 Residues of metabolites M11, M21 and M30 in barley hay following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
USA, 2005, North Rose, NY (Chapais)	2 × 0.11	7	236 237	85	7	Hay	0.05 0.04 (0.05)	0.04 0.04 (0.04)	0.01 < 0.01 (0.01)	137714 2006/7006917 RCN R05155 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Belleville, IL (Not stated)	2 × 0.11	7	138 153	85 69	0 7 14	Hay	0.05 0.05 (0.05) 0.06 0.07 (0.07) 0.19 0.15 (0.17)	0.04 0.04 (0.04) 0.03 0.04 (0.04) 0.05 0.05 (0.05)	0.01 0.01 (0.01) 0.01 0.01 (0.01) 0.03 0.03 (0.03)	137714 2006/7006917 RCN R05156 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, York, NB (Robust Barley)	2 × 0.11	7	188 185	85	7	Hay	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006917 RCN R05157 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Velva, ND (Excel)	2 × 0.11	7	112 113	85	8	Hay	< 0.01 < 0.01 (< 0.01)	0.01 0.02 (0.02)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006917 RCN R05158 METCON_148

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				M11	M21	M30	
										Max. frozen storage: 6.0 month
USA, 2005, Grand Island, NB (Robust Barley)	2 × 0.11	7	181 187	85	7	Hay	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006917 RCN R05159 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Young Ward, UT (Baroness)	2 × 0.11	7	176 178	87	7	Hay	0.06 0.06 (0.06)	0.07 0.07 (0.07)	0.01 0.01 (0.01)	137714 2006/7006917 RCN R05160 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Madera, CA, UT (Farmers Best)	2 × 0.11	7	281 281	87	7	Hay	0.02 0.02 (0.02)	0.03 0.03 (0.03)	< 0.01 < 0.01 (< 0.01)	137714 2006/7006917 RCN R05161 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Payette, ID (Baronesse)	2 × 0.11	7	284 279	87	7	Hay	0.04 0.04 (0.04)	0.05 0.05 (0.05)	0.01 0.01 (0.01)	137714 2006/7006917 RCN R05162 METCON_148 Max. frozen storage: 6.0 month
Canada, 2005, Rosthern, SK (AC Metcalfe)	2 × 0.11	7	201 196	85	7	Hay	0.06 0.04 (0.05)	0.08 0.06 (0.07)	0.01 0.01 (0.01)	137714 2006/7006917 RCN R05163 METCON_148 Max. frozen storage: 6.0 month
Canada, 2005, Minto, MB (AC Metcalfe)	2 × 0.11	7	206 207	87	7	Hay	0.12 0.11 (0.12)	0.07 0.06 (0.07)	0.03 0.03 (0.03)	137714 2006/7006917 RCN R05164 METCON_148 Max. frozen storage: 6.0 month
Canada, 2005, Innisfail, AB (CDC Bold)	2 × 0.11	7	244 243	85	7	Hay	0.15 0.13 (0.14)	0.13 0.12 (0.13)	0.03 0.03 (0.03)	137714 2006/7006917 RCN R05165 METCON_148 Max. frozen storage: 6.0 month
Canada, 2005, Innisfail, AB (CDC Bold)	2 × 0.11	7	248 230	87	7	Hay	0.38 0.33 (0.36)	0.20 0.19 (0.20)	0.07 0.06 (0.07)	137714 2006/7006917 RCN R05166 METCON_148 Max. frozen storage: 6.0 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] Residues of metabolites M11, M21 and M30 are expressed as parent equivalent (conversion factors 0.95, 0.95 and 0.96, respectively). For calculations, 0.01 mg/kg was used for residues below or at the LOQ for metabolites M11, M21 and M30.

Oat hay

A total of 12 field trials were conducted on oat in Canada and the USA during the 2004-05 growing seasons (Jordan & Saha, 2006, METCON_149). Plants received 2 foliar applications of metconazole at nominal rates of 112–123 g ai/ha. Oat hay was harvested at 6–8 days after the last application and left to dry on the field for up to 29 days. Additional samples from a decline trial were collected at 0, 7 and 14 days. Residues of cis- and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0508. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of < 20%.

Table 205 Residues of cis- and trans-metconazole in oat hay following foliar treatment (cGAP USA: 2 × 112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2005, North Rose, NY (AC Alymer)	2 × 0.11	7	234 233	71	7	Hay	7.9 8.1 (8.0)	1.4 1.5 (1.5)	9.3 9.6 (9.4)	137717 2006/7006724 RCN R05126 METCON_149 Max. frozen storage: 9.7 month
USA, 2005, Sunsweet, GA (Horizon 314)	1× 0.11 1× 0.12	8	172 159	45	7	Hay	3.2 3.0 (3.1)	0.63 0.56 (0.60)	3.8 3.5 (3.7)	137717 2006/7006724 RCN R05127 METCON_149 Max. frozen storage: 12 month
USA, 2005, Carlyle, IL, (Seed oats)	2 × 0.11	8	118 156	73	7	Hay	3.5 3.0 (3.2)	0.72 0.39 (0.56)	4.2 3.4 (3.8)	137717 2006/7006724 RCN R05128 METCON_149 Max. frozen storage: 10 month
USA, 2005, Arkansaw, WI, (Vista)	2 × 0.11	7	188 188	61	7	Hay	10.0 9.2 (9.6)	1.7 1.7 (1.7)	11.7 10.8 (11)	137717 2006/7006724 RCN R05129 METCON_149 Max. frozen storage: 9.5 month
USA, 2005, Eldridge, ND, (Morton)	2 × 0.11	8	95 117	39	8	Hay	6.8 4.1 (5.5)	1.3 0.93 (1.1)	8.1 5.1 (6.6)	137717 2006/7006724 RCN R05130 METCON_149 Max. frozen storage: 9.4 month

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2004, Grand Island, NE (Jerry)	2 × 0.11	7	188 187	61	6	Hay	2.2 6.0 (4.1)	0.43 1.0 (0.71)	2.7 7.0 (4.8)	137717 2006/7006724 RCN R05131 METCON_149 Max. frozen storage: 10 month
USA, 2005, Gardner, ND (Morton)	1× 0.12	7	160 149	39	0 7 14	Hay Hay Hay	7.9 7.8 (7.8) 3.0 3.6 (3.3) 1.7 2.3 (2.0)	1.5 1.4 (1.5) 0.60 0.64 (0.62) 0.37 0.53 (0.45)	9.4 9.2 (9.3) 3.6 4.2 (3.9) 2.0 2.8 (2.4)	137717 2006/7006724 RCN R05132 METCON_149 Max. frozen storage: 9.8 month
USA, 2005, Hinton, OK (Jerry)	2 × 0.11	7	128 126	71	6	Hay	5.0 5.2 (5.1)	0.96 1.1 (1.0)	6.0 6.2 (6.1)	137717 2006/7006724 RCN R05133 METCON_149 Max. frozen storage: 11 month
Canada, 2005, St-Cesaire, SK (Rigodon)	2 × 0.11	7	234 227	87	7	Hay	4.3 3.8 (4.1)	0.87 0.78 (0.83)	5.2 4.6 (4.9)	137717 2006/7006724 RCN R05134 METCON_149 Max. frozen storage: 8.3 month
Canada, 2005, Rosthern, SK (Furlong)	2 × 0.11	7	201 196	61	7	Hay	7.9 7.8 (7.9)	1.5 1.4 (1.5)	9.4 9.3 (9.4)	137717 2006/7006724 RCN R05135 METCON_149 Max. frozen storage: 7.9 month
Canada, 2005, Minto, MB (Triple Crown)	2 × 0.11	7	209 205	69	7	Hay	4.4 5.5 (4.9)	0.98 1.1 (1.1)	5.3 6.6 (6.0)	137717 2006/7006724 RCN R05136 METCON_149 Max. frozen storage: 8.4 month
Canada, 2005, Innisfail, AB (AC Lu)	2 × 0.11	6	252 223	69	7	Hay	1.9 2.4 (2.1)	0.43 0.52 (0.48)	2.3 2.9 (2.6)	137717 2006/7006724 RCN R05137 METCON_149 Max. frozen storage: 7.7 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 206 Residues of metabolites M11, M21 and M30 in oat hay following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location,	Application	Growth	DALA	Sample	Residues found [mg/kg] [ab]	Report/Trial No.,

Year (variety	g ai/ha	Interval (days)	L/ha	stage at final appl.			M11	M21	M30	Reference, Storage period
USA, 2005, North Rose, NY (AC Alymer)	2 × 0.11	7	234 233	71	7	Hay	0.03 0.04 (0.035)	0.11 0.12 (0.12)	0.010 0.020 (0.015)	137717 2006/7006724 RCN R05126 METCON_149 Max. frozen storage: 9.7 month
USA, 2005, Sunsweet, GA (Horizon 314)	1× 0.11 1× 0.12	8	172 159	45	7	Hay	0.010 0.010 (0.010)	0.030 0.030 (0.030)	< 0.01 < 0.01 (< 0.01)	137717 2006/7006724 RCN R05127 METCON_149 Max. frozen storage: 12 month
USA, 2005, Carlyle, IL, (Seed oats)	2 × 0.11	8	118 156	73	7	Hay	0.020 0.010 (0.015)	0.060 0.050 (0.055)	< 0.01 < 0.01 (< 0.01)	137717 2006/7006724 RCN R05128 METCON_149 Max. frozen storage: 10 month
USA, 2005, Arkansaw, WI, (Vista)	2 × 0.11	7	188 188	61	7	Hay	0.080 0.080 (0.080)	0.12 0.12 (0.12)	0.020 0.020 (0.020)	137717 2006/7006724 RCN R05129 METCON_149 Max. frozen storage: 9.5 month
USA, 2005, Eldridge, ND, (Morton)	2 × 0.11	8	95 117	39	8	Hay	0.030 0.020 (0.025)	0.080 0.050 (0.065)	0.010 < 0.01 (0.010)	137717 2006/7006724 RCN R05130 METCON_149 Max. frozen storage: 9.4 month
USA, 2004, Grand Island, NE (Jerry)	2 × 0.11	7	188 187	61	6	Hay	< 0.01 0.020 (0.015)	0.040 0.100 (0.070)	< 0.01 < 0.01 (< 0.01)	137717 2006/7006724 RCN R05131 METCON_149 Max. frozen storage: 10 month
USA, 2005, Gardner, ND (Morton)	1× 0.12	7	160 149	39	0 7 14	Hay Hay Hay	0.050 0.040 (0.045) 0.020 0.020 (0.020) 0.020 0.020 (0.020)	0.080 0.080 (0.080) 0.030 0.040 (0.035) 0.030 0.030 (0.030)	0.020 0.020 (0.020) < 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01)	137717 2006/7006724 RCN R05132 METCON_149 Max. frozen storage: 9.8 month
USA, 2005, Hinton, OK (Jerry)	2 × 0.11	7	128 126	71	6	Hay	0.33 0.29 (0.31)	0.10 0.12 (0.11)	0.050 0.050 (0.050)	137717 2006/7006724 RCN R05133 METCON_149 Max. frozen storage: 11 month

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
Canada, 2005, St-Cesaire, SK (Rigodon)	2 × 0.11	7	234 227	87	7	Hay	0.43 0.39 (0.41)	0.11 0.10 (0.11)	0.040 0.040 (0.040)	137717 2006/7006724 RCN R05134 METCON_149 Max. frozen storage: 8.3 month
Canada, 2005, Rosthern, SK (Furlong)	2 × 0.11	7	201 196	61	7	Hay	0.050 0.070 (0.060)	0.11 0.11 (0.11)	0.020 0.020 (0.020)	137717 2006/7006724 RCN R05135 METCON_149 Max. frozen storage: 7.9 month
Canada, 2005, Minto, MB (Triple Crown)	2 × 0.11	7	209 205	69	7	Hay	0.11 0.07 (0.09)	0.10 0.090 (0.095)	0.030 0.020 (0.025)	137717 2006/7006724 RCN R05136 METCON_149 Max. frozen storage: 8.4 month
Canada, 2005, Innisfail, AB (AC Lu)	2 × 0.11	6	252 223	69	7	Hay	0.16 0.18 (0.17)	0.090 0.10 (0.095)	0.020 0.030 (0.025)	137717 2006/7006724 RCN R05137 METCON_149 Max. frozen storage: 7.7 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] Residues of metabolites M11, M21 and M30 are expressed as parent equivalent (conversion factors 0.95, 0.95 and 0.96, respectively). For calculations, 0.01 mg/kg was used for residues below or at the LOQ for metabolites M11, M21 and M30.

Wheat straw

A total of 15 field trials were conducted on wheat in Canada and the USA during the 2004-05 growing seasons (White & Saha, 2006, METCON_152). Plants received 2 foliar applications of metconazole at nominal rates of 89–112 g ai/ha. Wheat straw was harvested at 20–22 days after the last application. Additional samples from a decline trial were collected at 14, 21–22, 28 and 35–36 days. Residues of cis- and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0508. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of <20%, with the exception of M11 where the RSD was 26%.

Table 207 Residues of *cis*- and *trans*-metconazole in wheat straw following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2005, Sunsweet, GA (Pioneer 26R24)	2 × 0.11	8	134 140	85	21	Straw	1.2 1.6 (1.4)	0.27 0.35 (0.31)	1.5 2.0 (1.7)	137711 2006/7006723 RCN R05044 METCON_152 Max. frozen storage: 6.4

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
										month
USA, 2005, Newport, AK (Genesis R033)	2 × 0.11	6	187 189	75	21	Straw	6.5 6.8 (6.7)	1.1 1.3 (1.2)	7.6 8.1 (7.9)	137711 2006/7006723 RCN R05045 METCON_152 Max. frozen storage: 6.4 month
USA, 2005, York, NE, (Millenium)	2 × 0.11	7	186 188	83	20	Straw	3.3 5.8 (4.6)	0.55 1.0 (0.78)	3.9 6.7 (5.3)	137711 2006/7006723 RCN R05046 METCON_152 Max. frozen storage: 5.1 month
USA, 2005, Carlyle, IL, (Excel 201)	2 × 0.11	7	115 158	83	14 21 28 35	Straw Straw Straw Straw	2.5 3.1 (2.8) 3.9 3.8 (3.8) 3.7 4.3 (4.0) 3.7 4.3 (4.0)	0.52 0.58 (0.55) 0.82 0.74 (0.78) 0.74 0.85 (0.80) 0.74 0.85 (0.80)	3.0 3.7 (3.4) 4.7 4.5 (4.6) 4.4 5.1 (4.8) 4.4 5.1 (4.8)	137711 2006/7006723 RCN R05047 METCON_152 Max. frozen storage: 5.7 month
USA, 2005, Grand Island, NE (Jagalene HRW)	2 × 0.11	7	188 189	77	22	Straw	1.4 2.3 (1.9)	0.31 0.54 (0.42)	1.7 2.9 (2.3)	137711 2006/7006723 RCN R05048 METCON_152 Max. frozen storage: 5.0 month
USA, 2005, Velva, ND (Dapps)	2 × 0.11	7	113 113	75	20	Straw	2.0 2.2 (2.1)	0.35 0.41 (0.38)	2.4 2.6 (2.5)	137711 2006/7006723 RCN R05049 METCON_152 Max. frozen storage: 4.5 month
USA, 2005, Gardner, ND (Knudson)	2 × 0.12	6	152 147	77	14 22 28 36	Straw Straw Straw Straw	1.1 1.1 (1.1) 1.3 0.94 (1.1) 1.0 1.0 (1.0) 0.66 0.86 (0.76)	0.18 0.17 (0.17) 0.16 0.13 (0.14) 0.15 0.15 (0.15) 0.097 0.12 (0.11)	1.3 1.3 (1.3) 1.4 1.1 (1.2) 1.2 1.2 (1.2) 0.76 0.98 (0.87)	137711 2006/7006723 RCN R05050 METCON_152 Max. frozen storage: 4.3 month
USA, 2005, Hinton, OK (Jagalene)	2 × 0.11	7	122 126	85	22	Straw	0.22 0.50 (0.36)	0.048 0.070 (0.059)	0.27 0.57 (0.42)	137711 2006/7006723 RCN R05051 METCON_152 Max. frozen storage: 6.2 month
USA, 2005,	1 × 0.11	7	128	85	21	Straw	8.2	1.4	9.6	137711

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				Metconazole *cis*	Metconazole *trans*	Total	
Colony, OK (Jagger)	1 × 0.09		105				8.4 (8.3)	1.5 (1.4)	9.8 (9.7)	2006/7006723 RCN R05052 METCON_152 Max. frozen storage: 6.3 month
USA, 2005, Lubbock, TX (TAM 200)	2 × 0.11	8	141 138	87	21	Straw	3.1 3.9 (3.5)	0.56 0.76 (0.66)	3.7 4.6 (4.1)	137711 2006/7006723 RCN R05053 METCON_152 Max. frozen storage: 6.0 month
USA, 2005, Payette, ID (Penawawa)	2 × 0.11	6	278 283	87	21	Straw	0.63 0.91 (0.77)	3.5 4.7 (4.1)	4.2 5.6 (4.9)	137711 2006/7006723 RCN R05054 METCON_152 Max. frozen storage: 4.0 month
Canada, 2005, Laird, SK (Bounty)	2 × 0.11	6	135 149	85	21	Straw	0.15 0.16 (0.16)	1.0 1.0 (1.0)	1.2 1.2 (1.2)	137711 2006/7006723 RCN R05055 METCON_152 Max. frozen storage: 3.3 month
Canada, 2005, Minto, MB (AC Barrie)	2 × 0.11	6	218 197	85	21	Straw	0.42 0.36 (0.39)	2.0 2.2 (2.2)	2.5 2.6 (2.6)	137711 2006/7006723 RCN R05056 METCON_152 Max. frozen storage: 3.6 month
Canada, 2005, Innisfail, AB (AC Intrepid)	2 × 0.11	7	226 233	85	21	Straw	0.35 0.40 (0.38)	2.1 2.1 (2.1)	2.4 2.5 (2.5)	137711 2006/7006723 RCN R05057 METCON_152 Max. frozen storage: 2.7 month
Canada, 2005, Innisfail, AB (5700PR)	2 × 0.11	7	202 225	85	21	Straw	0.55 0.55 (0.55)	2.8 3.1 (2.9)	3.4 3.6 (3.5)	137711 2006/7006723 RCN R05058 METCON_152 Max. frozen storage: 2.9 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 208 Residues of metabolites M11, M21 and M30 in wheat straw following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				M11	M21	M30	
USA, 2005, Sunsweet,	2 × 0.11	8	134 140	85	21	Straw	0.86 1.3	0.090 0.12	0.080 0.11	137711 2006/7006723

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
GA (Pioneer 26R24)							(1.1)	(0.11)	(0.10)	RCN R05044 METCON_152 Max. frozen storage: 6.4 month
USA, 2005, Newport, AK (Genesis R033)	2 × 0.11	6	187 189	75	21	Straw	0.39 0.38 (0.39)	0.19 0.21 (0.20)	0.050 0.050 (0.050)	137711 2006/7006723 RCN R05045 METCON_152 Max. frozen storage: 6.4 month
USA, 2005, York, NE, (Millenium)	2 × 0.11	7	186 188	83	20	Straw	0.56 0.76 (0.66)	0.21 0.32 (0.27)	0.10 0.12 (0.11)	137711 2006/7006723 RCN R05046 METCON_152 Max. frozen storage: 5.1 month
USA, 2005, Carlyle, IL, (Excel 201)	2 × 0.11	7	115 158	83	14 21 28 35	Straw Straw Straw Straw	0.48 0.50 (0.49) 0.93 0.78 (0.86) 1.2 1.2 (1.2) 1.5 1.6 (1.6)	0.14 0.16 (0.15) 0.30 0.23 (0.27) 0.38 0.44 (0.41) 0.47 0.37 (0.42)	0.050 0.070 (0.060) 0.14 0.11 (0.13) 0.17 0.18 (0.18) 0.22 0.23 (0.23)	137711 2006/7006723 RCN R05047 METCON_152 Max. frozen storage: 5.7 month
USA, 2005, Grand Island, NE (Jagalene HRW)	2 × 0.11	7	188 189	77	22	Straw	0.45 0.59 (0.52)	0.14 0.20 (0.17)	0.080 0.12 (0.10)	137711 2006/7006723 RCN R05048 METCON_152 Max. frozen storage: 5.0 month
USA, 2005, Velva, ND (Dapps)	2 × 0.11	7	113 113	75	20	Straw	0.070 0.070 (0.070)	0.080 0.090 (0.085)	0.020 0.020 (0.020)	137711 2006/7006723 RCN R05049 METCON_152 Max. frozen storage: 4.5 month
USA, 2005, Gardner, ND (Knudson)	2 × 0.12	6	152 147	77	14 22 28 36	Straw Straw Straw Straw	0.12 0.12 (0.12) 0.17 0.14 (0.16) 0.17 0.18 (0.18) 0.14 < 0.01 (0.080)	0.060 0.060 (0.060) 0.070 0.070 (0.070) 0.07 0.07 (0.07) 0.050 0.060 (0.055)	0.020 0.020 (0.020) 0.030 0.030 0.030 0.040 0.040 (0.040) 0.030 0.040 (0.035)	137711 2006/7006723 RCN R05050 METCON_152 Max. frozen storage: 4.3 month
USA, 2005, Hinton, OK (Jagalene)	2 × 0.11	7	122 126	85	22	Straw	0.080 0.11 (0.10)	0.040 0.060 (0.050)	0.020 0.030 (0.025)	137711 2006/7006723 RCN R05051 METCON_152

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
										Max. frozen storage: 6.2 month
USA, 2005, Colony, OK (Jagger)	1 × 0.11 1 × 0.09	7	128 105	85	21	Straw	0.91 0.86 (0.89)	0.45 0.45 (0.45)	0.12 0.12 (0.12)	137711 2006/7006723 RCN R05052 METCON_152 Max. frozen storage: 6.3 month
USA, 2005, Lubbock, TX (TAM 200)	2 × 0.11	8	141 138	87	21	Straw	0.18 0.40 (0.29)	0.050 0.080 (0.065)	0.040 0.050 (0.045)	137711 2006/7006723 RCN R05053 METCON_152 Max. frozen storage: 6.0 month
USA, 2005, Payette, ID (Penawawa)	2 × 0.11	6	278 283	87	21	Straw	0.030 0.040 (0.035)	0.050 0.060 (0.055)	0.010 0.010 (0.010)	137711 2006/7006723 RCN R05054 METCON_152 Max. frozen storage: 4.0 month
Canada, 2005, Laird, SK (Bounty)	2 × 0.11	6	135 149	85	21	Straw	0.060 0.070 (0.065)	0.070 0.070 (0.070)	0.010 0.010 (0.010)	137711 2006/7006723 RCN R05055 METCON_152 Max. frozen storage: 3.3 month
Canada, 2005, Minto, MB (AC Barrie)	2 × 0.11	6	218 197	85	21	Straw	0.14 0.14 (0.14)	0.12 0.13 (0.13)	0.030 0.030 (0.030)	137711 2006/7006723 RCN R05056 METCON_152 Max. frozen storage: 3.6 month
Canada, 2005, Innisfail, AB (AC Intrepid)	2 × 0.11	7	226 233	85	21	Straw	0.080 0.070 (0.075)	0.080 0.090 (0.085)	0.010 0.010 (0.010)	137711 2006/7006723 RCN R05057 METCON_152 Max. frozen storage: 2.7 month
Canada, 2005, Innisfail, AB (5700PR)	2 × 0.11	7	202 225	85	21	Straw	0.45 0.43 (0.44)	0.20 0.21 (0.21)	0.040 0.040 (0.040)	137711 2006/7006723 RCN R05058 METCON_152 Max. frozen storage: 2.9 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] Residues of metabolites M11, M21 and M30 are expressed as parent equivalent (conversion factors 0.95, 0.95 and 0.96, respectively). For calculations, 0.01 mg/kg was used for residues below or at the LOQ for metabolites M11, M21 and M30.

Rye straw

A total of five field trials were conducted on rye in Canada and the USA during the 2004-05 growing seasons (Jordan & Saha, 2006, METCON_151). Plants received 2 foliar applications of metconazole at nominal rates of 112 g ai/ha. Rye straw was harvested at 20–22 days after the last application. Additional samples from a decline trial were collected at 14, 21, 28 and 34 days. Residues of cis- and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0508. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120%.

Table 209 Residues of *cis*- and *trans*-metconazole in rye straw following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2005, Chula, GA (Wrens Abruzzi)	2 × 0.11	7	136 127	Soft dough	21	Straw	3.6 3.5 (3.6)	0.87 0.82 (0.85)	4.4 4.3 (4.4)	137720 2006/7006725 R05145 METCON_151 Max. frozen storage: 12 month
USA, 2005, York, NE, (VNS Winter Rye)	2 × 0.11	7	188 188	Late milk	22	Straw	2.0 2.3 (2.2)	0.14 0.16 (0.15)	2.2 2.4 (2.3)	137720 2006/7006725 R05146 METCON_151 Max. frozen storage: 10 month
USA, 2005, Eldridge, ND, (Dahcold)	1× 0.11 1× 0.12	6	143 149	Late milk	14 21 28 34	Straw Straw Straw Straw	4.0 3.8 (3.9) 3.8 2.8 (3.3) 2.6 3.1 (2.9) 3.6 4.6 (4.1)	0.90 0.83 (0.87) 0.92 0.60 (0.76) 0.58 0.72 (0.65) 0.82 1.0 (0.91)	4.9 4.7 (4.8) 4.7 3.5 (4.1) 3.2 3.8 (3.5) 4.5 5.6 (5.0)	137720 2006/7006725 R05147 METCON_151 Max. frozen storage: 9.7 month
Canada, 2005, Rosthern, SK (Gazelle)	2 × 0.11	8	204 200	Soft dough	20	Straw	1.8 2.0 (1.9)	0.13 0.16 (0.15)	1.9 2.2 (2.1)	137720 2006/7006725 R05148 METCON_151 Max. frozen storage: 7.9 month
Canada, 2005, Minto, MB (Common Rye Seed)	2 × 0.11	7	207 206	Hard dough	22	Straw	7.4 7.0 (7.2)	1.4 1.2 (1.3)	8.8 8.2 (8.5)	137720 2006/7006725 R05149 METCON_151 Max. frozen storage: 9.0 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 210 Residues of metabolites M11, M21 and M30 in rye straw following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
USA, 2005, Chula, GA (Wrens Abruzzi)	2 × 0.11	7	136 127	Soft dough	21	Straw	0.57 0.19 (0.38)	0.04 0.04 (0.04)	0.03 0.02 (0.025)	137720 2006/7006725 R05145 METCON_151 Max. frozen storage: 12 month
USA, 2005, York, NE, (VNS Winter Rye)	2 × 0.11	7	188 188	Late milk	22	Straw	0.69 0.18 (0.44)	0.06 0.06 (0.06)	0.04 0.04 (0.04)	137720 2006/7006725 R05146 METCON_151 Max. frozen storage: 10 month
USA, 2005, Eldridge, ND, (Dahcold)	1× 0.11 1× 0.12	6	143 149	Late milk	14 21 28 34	Straw Straw Straw Straw	0.18 0.17 (0.18) 0.91 0.60 (0.76) 0.72 1.1 (0.91) 1.5 1.7 (1.6)	0.08 0.07 (0.075) 0.11 0.14 (0.13) 0.08 0.10 (0.09) 0.14 0.17 (0.16)	0.03 0.03 (0.030) 0.04 0.06 (0.05) 0.04 0.06 (0.05) 0.07 0.08 (0.075)	137720 2006/7006725 R05147 METCON_151 Max. frozen storage: 9.6 month
Canada, 2005, Rosthern, SK (Gazelle)	2 × 0.11	8	204 200	Soft dough	20	Straw	0.05 0.06 (0.055)	0.04 0.05 (0.045)	0.01 0.01 (0.010)	137720 2006/7006725 R05148 METCON_151 Max. frozen storage: 7.7 month
Canada, 2005, Minto, MB (Common Rye Seed)	2 × 0.11	7	207 206	Hard dough	22	Straw	0.68 0.19 (0.44)	0.13 0.12 (0.13)	0.04 0.04 (0.04)	137720 2006/7006725 R05149 METCON_151 Max. frozen storage: 8.9 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] Residues of metabolites M11, M21 and M30 are expressed as parent equivalent (conversion factors 0.95, 0.95 and 0.96, respectively). For calculations, 0.01 mg/kg was used for residues below or at the LOQ for metabolites M11, M21 and M30.

Barley straw

A total of 12 field trials were conducted on barley in the USA during the 2004-05 growing seasons (White & Saha, 2006, METCON_148). Plants received 2 foliar applications of metconazole at nominal rates of 112–123 g ai/ha. Barley straw was harvested at 20–21 days after the last application. Additional samples from a decline trial were collected at 14, 21, 28 and 35 days. Residues of cis- and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0508. The limit of quantification for the sum of cis- and trans-metconazole and metabolites

M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of <20%.

Table 211 Residues of cis- and trans-metconazole in barley straw following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2005, North Rose, NY (Chapais)	2 × 0.12	2 × 0.12	8	71	20	Straw	0.85 0.74 (0.79)	0.12 0.11 (0.12)	0.97 0.85 (0.91)	137714 2006/7006917 RCN R05155 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Belleville, IL (Not stated)	1× 0.11 1× 0.12	1× 0.11 1× 0.12	7	69	14	Straw	3.0 3.3 (3.2)	0.72 0.70 (0.71)	3.7 4.0 (3.9)	137714 2006/7006917 RCN R05156 METCON_148 Max. frozen storage: 6.0 month
					21	Straw	2.7 2.5 (2.6)	0.59 0.52 (0.56)	3.31 3.02 (3.2)	
					28	Straw	2.5 1.7 (2.1)	0.57 0.38 (0.47)	3.07 2.1 (2.6)	
					35	Straw	1.46 1.42 (1.4)	0.29 0.29 (0.29)	1.8 1.7 (1.7)	
USA, 2005, York, NB (Robust Barley)	2 × 0.11	2 × 0.11	7	58	21	Straw	1.628 1.8 (1.7)	0.21 0.34 (0.28)	1.8 2.1 (2.0)	137714 2006/7006917 RCN R05157 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Velva, ND (Excel)	2 × 0.11	2 × 0.11	7	69	20	Straw	1.8 1.3 (1.5)	0.33 0.18 (0.26)	2.1 1.5 (1.8)	137714 2006/7006917 RCN R05158 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Grand Island, NB (Robust Barley)	2 × 0.11	2 × 0.11	7	58	21	Straw	2.7 3.1 (2.9)	0.53 0.56 (0.55)	3.2 3.6 (3.4)	137714 2006/7006917 RCN R05159 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Young Ward, UT (Baroness)	2 × 0.12	2 × 0.12	8	87	20	Straw	3.5 3.5 (3.5)	0.68 0.67 (0.68)	4.2 4.2 (4.2)	137714 2006/7006917 RCN R05160 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Madera, CA, UT (Farmers	2 × 0.11	2 × 0.11	7	87	21	Straw	3.9 3.7 (3.8)	0.71 0.78 (0.75)	4.7 4.5 (4.6)	137714 2006/7006917 RCN R05161 METCON_148

Location, Year (variety Best)	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				Metconazole *cis*	*trans*	Total	
										Max. frozen storage: 6.0 month
USA, 2005, Payette, ID (Baronesse)	1× 0.11 1×0.12	1× 0.11 1×0.12	7	58	21	Straw	2.8 2.4 (2.6)	0.57 0.48 (0.52)	3.3 2.9 (3.1)	137714 2006/7006917 RCN R05162 METCON_148 Max. frozen storage: 6.0 month
Canada, 2005, Rosthern, SK (AC Metcalfe)	2 × 0.11	2 × 0.11	6	73	21	Straw	0.54 0.59 (0.57)	0.09 0.10 (0.10)	0.64 0.70 (0.67)	137714 2006/7006917 RCN R05163 METCON_148 Max. frozen storage: 6.0 month
Canada, 2005, Minto, MB (AC Metcalfe)	2 × 0.11	2 × 0.11	8	75	20	Straw	2.7 3.0 (2.8)	0.49 0.54 (0.50)	3.1 3.5 (3.3)	137714 2006/7006917 RCN R05164 METCON_148 Max. frozen storage: 6.0 month
Canada, 2005, Innisfail, AB (CDC Bold)	2 × 0.11	2 × 0.11	7	61	21	Straw	1.6 1.9 (1.7)	0.33 0.37 (0.35)	2.0 2.2 (2.1)	137714 2006/7006917 RCN R05165 METCON_148 Max. frozen storage: 6.0 month
Canada, 2005, Innisfail, AB (CDC Bold)	2 × 0.11	2 × 0.11	7	57	21	Straw	3.5 3.7 (3.6)	0.81 0.82 (0.82)	4.3 4.5 (4.4)	137714 2006/7006917 RCN R05166 METCON_148 Max. frozen storage: 6.0 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 212 Residues of metabolites M11, M21 and M30 in barley straw following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				M11	M21	M30	
USA, 2005, North Rose, NY (Chapais)	2 × 0.12	2 × 0.12	8	71	20	Straw	0.540 0.480 (0.51)	0.070 0.060 (0.07)	0.070 0.070 (0.07)	137714 2006/7006917 RCN R05155 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Belleville, IL (Not stated)	1× 0.11 1× 0.12	1× 0.11 1× 0.12	7	69	14	Straw	0.90 0.81 (0.86)	0.42 0.40 (0.41)	0.14 0.13 (0.14)	137714 2006/7006917 RCN R05156 METCON_148 Max. frozen

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
					21	Straw	1.1 0.95 (1.02)	0.46 0.40 (0.43)	0.15 0.14 (0.15)	storage: 6.0 month
					28	Straw	1.1 0.95 (1.1)	0.48 0.36 (0.42)	0.17 0.14 (0.16)	
					35	Straw	0.87 0.97 (0.92)	0.36 0.32 (0.34)	0.14 0.15 (0.15)	
USA, 2005, York, NB (Robust Barley)	2 × 0.11	2 × 0.11	7	58	21	Straw	0.50 0.51 (0.51)	0.12 0.12 (0.12)	0.06 0.06 (0.06)	137714 2006/7006917 RCN R05157 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Velva, ND (Excel)	2 × 0.11	2 × 0.11	7	69	20	Straw	0.10 0.08 (0.09)	0.07 0.06 (0.07)	0.02 0.02 (0.02)	137714 2006/7006917 RCN R05158 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Grand Island, NB (Robust Barley)	2 × 0.11	2 × 0.11	7	58	21	Straw	0.49 0.54 (0.52)	0.13 0.14 (0.14)	0.06 0.07 (0.07)	137714 2006/7006917 RCN R05159 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Young Ward, UT (Baroness)	2 × 0.12	2 × 0.12	8	87	20	Straw	0.11 0.11 (0.11)	0.11 0.11 (0.11)	0.03 0.03 (0.03)	137714 2006/7006917 RCN R05160 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Madera, CA, UT (Farmers Best)	2 × 0.11	2 × 0.11	7	87	21	Straw	0.03 0.03 (0.03)	0.05 0.05 (0.05)	0.01 0.01 (0.01)	137714 2006/7006917 RCN R05161 METCON_148 Max. frozen storage: 6.0 month
USA, 2005, Payette, ID (Baronesse)	1× 0.11 1×0.12	1 × 0.11 1 × 0.12	7	58	21	Straw	0.040 0.030 (0.04)	0.060 0.040 (0.05)	0.010 0.010 (0.01)	137714 2006/7006917 RCN R05162 METCON_148 Max. frozen storage: 6.0 month
Canada, 2005, Rosthern, SK (AC Metcalfe)	2 × 0.11	2 × 0.11	6	73	21	Straw	0.09 0.10 (0.10)	0.09 0.09 (0.09)	0.030 0.03 (0.03)	137714 2006/7006917 RCN R05163 METCON_148 Max. frozen storage: 6.0 month
Canada,	2 ×	2 × 0.11	8	75	20	Straw	0.68	0.36	0.08	137714

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
2005, Minto, MB (AC Metcalfe)	0.11						0.55 (0.62)	0.33 (0.35)	0.08 (0.08)	2006/7006917 RCN R05164 METCON_148 Max. frozen storage: 6.0 month
Canada, 2005, Innisfail, AB (CDC Bold)	2 × 0.11	2 × 0.11	7	61	21	Straw	0.33 0.36 (0.35)	0.13 0.13 (0.13)	0.05 0.05 (0.05)	137714 2006/7006917 RCN R05165 METCON_148 Max. frozen storage: 6.0 month
Canada, 2005, Innisfail, AB (CDC Bold)	2 × 0.11	2 × 0.11	7	57	21	Straw	0.75 0.85 (0.80)	0.42 0.41 (0.42)	0.05 0.05 (0.05)	137714 2006/7006917 RCN R05166 METCON_148 Max. frozen storage: 6.0 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] Residues of metabolites M11, M21 and M30 are expressed as parent equivalent (conversion factors 0.95, 0.95 and 0.96, respectively). For calculations, 0.01 mg/kg was used for residues below or at the LOQ for metabolites M11, M21 and M30.

Oat straw

A total of 12 field trials were conducted on oat in Canada and the USA during the 2004-05 growing seasons (Jordan & Saha, 2006, METCON_149). Plants received 2 foliar applications of metconazole at nominal rates of 112–123 g ai/ha. Oat straw was harvested at 20–21 days after the last application. Additional samples from a decline trial were collected at 14, 21, 28 and 36 days. Residues of cis- and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0508. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of <20%.

Table 213 Residues of cis- and trans-metconazole in oat straw following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2005, North Rose, NY (AC Alymer)	2 × 0.11	8	227 233	83	20	Straw	1.3 1.2 (1.2)	0.27 0.19 (0.23)	1.5 1.4 (1.5)	137717 2006/7006724 RCN R05126 METCON_149 Max. frozen storage: 9.5 month
USA, 2005, Sunsweet, GA (Horizon 314)	2 × 0.11	7	131 136	85	21	Straw	1.8 1.8 (1.8)	0.42 0.43 (0.42)	2.2 2.2 (2.2)	137717 2006/7006724 RCN R05127 METCON_149 Max. frozen storage: 12 month

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2005, Carlyle, IL, (Seed oats)	1× 0.12 1×0.11	7	166 167	85	21	Straw	1.4 1.5 (1.4)	0.30 0.31 (0.31)	1.7 1.8 (1.7)	137717 2006/7006724 RCN R05128 METCON_149 Max. frozen storage: 10 month
USA, 2005, Arkansaw, WI, (Vista)	1× 0.12 1× 0.11	7	188 189	75	20	Straw	4.6 5.1 (4.8)	0.79 0.87 (0.83)	5.4 6.0 (5.7)	137717 2006/7006724 RCN R05129 METCON_149 Max. frozen storage: 9.4 month
USA, 2005, Eldridge, ND, (Morton)	2 × 0.11	7	186 142	75	21	Straw	1.5 0.95 (1.3)	0.22 0.15 (0.19)	1.8 1.1 (1.4)	137717 2006/7006724 RCN R05130 METCON_149 Max. frozen storage: 9.1 month
USA, 2004, Grand Island, NE (Jerry)	1× 0.12 1× 0.11	7	189 189	85	21	Straw	2.7 2.0 (2.3)	0.61 0.48 (0.55)	3.3 2.4 (2.9)	137717 2006/7006724 RCN R05131 METCON_149 Max. frozen storage: 9.3 month
USA, 2005, Gardner, ND (Morton)	1× 0.12	6	149 149	75	14 21 28 36	Straw	2.6 2.4 (2.5) 1.1 1.1 (1.1) 1.3 1.7 (1.5) 1.3 0.75 (1.0)	0.62 0.49 (0.56) 0.16 0.20 (0.18) 0.21 0.42 (0.31) 0.18 0.12 (0.15)	3.2 2.8 (3.0) 1.2 1.3 (1.2) 1.5 2.1 (1.8) 1.5 0.87 (1.2)	137717 2006/7006724 RCN R05132 METCON_149 Max. frozen storage: 9.4 month
USA, 2005, Hinton, OK (Jerry)	2 × 0.11	7	126 132	77	26	Straw	0.83 0.85 (0.84)	0.16 0.16 (0.16)	0.99 1.0 (1.0)	137717 2006/7006724 RCN R05133 METCON_149 Max. frozen storage: 10 month
Canada, 2005, St-Cesaire, SK (Rigodon)	1× 0.12 1× 0.11	7	202 228	87	21	Straw	1.2 1.5 (1.4)	0.21 0.19 (0.20)	1.4 1.7 (1.6)	137717 2006/7006724 RCN R05134 METCON_149 Max. frozen storage: 8.1 month
Canada, 2005,	2 × 0.11	8	204	83	20	Straw	1.2	0.21	1.4	137717 2006/7006724

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
Rosthern, SK (Furlong)			200				1.4 (1.3)	0.30 (0.26)	1.6 (1.5)	RCN R05135 METCON_149 Max. frozen storage: 7.4 month
Canada, 2005, Minto, MB (Triple Crown)	2 × 0.11	7	208 199	87	20	Straw	2.1 2.7 (2.4)	0.51 0.58 (0.54)	2.7 3.3 (3.0)	137717 2006/7006724 RCN R05136 METCON_149 Max. frozen storage: 7.9 month
Canada, 2005, Innisfail, AB (AC Lu)	2 × 0.11	7	226 234	85	21	Straw	2.0 2.2 (2.1)	0.45 0.54 (0.49)	2.4 2.7 (2.6)	137717 2006/7006724 RCN R05137 METCON_149 Max. frozen storage: 7.1 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 214 Residues of metabolites M11, M21 and M30 in oat straw following foliar treatment (cGAP USA: 2×112 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
USA, 2005, North Rose, NY (AC Alymer)	2 × 0.11	8	227 233	83	20	Straw	0.30 0.37 (0.34)	0.050 0.040 (0.045)	0.040 0.040 (0.040)	137717 2006/7006724 RCN R05126 METCON_149 Max. frozen storage: 9.5 month
USA, 2005, Sunsweet, GA (Horizon 314)	2 × 0.11	7	131 136	85	21	Straw	0.42 0.43 (0.43)	0.060 0.060 (0.060)	0.030 0.030 (0.030)	137717 2006/7006724 RCN R05127 METCON_149 Max. frozen storage: 12 month
USA, 2005, Carlyle, IL, (Seed oats)	1× 0.12 1× 0.11	7	166 167	85	21	Straw	0.52 0.55 (0.54)	0.070 0.070 (0.070)	0.050 0.050 (0.050)	137717 2006/7006724 RCN R05128 METCON_149 Max. frozen storage: 10 month
USA, 2005, Arkansaw, WI, (Vista)	1× 0.12 1× 0.11	7	188 189	75	20	Straw	2.2 2.5 (2.3)	0.44 0.49 (0.47)	0.15 0.18 (0.17)	137717 2006/7006724 RCN R05129 METCON_149 Max. frozen storage: 9.4 month
USA, 2005, Eldridge, ND,	2 × 0.11	7	186	75	21	Straw	0.08	0.04	0.01	137717 2006/7006724

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				M11	M21	M30	
(Morton)			142				0.04 (0.060)	0.03 (0.035)	< 0.01 (0.010)	RCN R05130 METCON_149 Max. frozen storage: 9.1 month
USA, 2004, Grand Island, NE (Jerry)	1× 0.12 1× 0.11	7	189 189	85	21	Straw	0.28 0.19 (0.24)	0.12 0.09 (0.11)	0.040 0.030 (0.035)	137717 2006/7006724 RCN R05131 METCON_149 Max. frozen storage: 9.3 month
USA, 2005, Gardner, ND (Morton)	1× 0.12	6	149 149	75	14 21 28 36	Straw	0.040 0.040 (0.040) 0.020 0.030 (0.025) 0.090 0.11 (0.10) 0.18 0.15 (0.17)	0.050 0.040 (0.045) 0.020 0.020 (0.020) 0.040 0.040 (0.040) 0.040 0.030 (0.035)	< 0.01 < 0.01 (< 0.01) < 0.01 < 0.01 (< 0.01) 0.010 0.020 (0.015) 0.030 0.020 (0.025)	137717 2006/7006724 RCN R05132 METCON_149 Max. frozen storage: 9.4 month
USA, 2005, Hinton, OK (Jerry)	2 × 0.11	7	126 132	77	26	Straw	0.42 0.43 (0.43)	0.070 0.080 (0.075)	0.050 0.050 (0.050)	137717 2006/7006724 RCN R05133 METCON_149 Max. frozen storage: 10 month
Canada, 2005, St-Cesaire, SK (Rigodon)	1× 0.12 1× 0.11	7	202 228	87	21	Straw	0.37 0.47 (0.42)	0.060 0.070 (0.065)	0.040 0.050 (0.045)	137717 2006/7006724 RCN R05134 METCON_149 Max. frozen storage: 8.1 month
Canada, 2005, Rosthern, SK (Furlong)	2 × 0.11	8	204 200	83	20	Straw	0.050 0.050 (0.050)	0.030 0.040 (0.035)	< 0.01 < 0.01 (< 0.01)	137717 2006/7006724 RCN R05135 METCON_149 Max. frozen storage: 7.4 month
Canada, 2005, Minto, MB (Triple Crown)	2 × 0.11	7	208 199	87	20	Straw	0.33 0.49 (0.41)	0.15 0.34 (0.25)	0.050 0.060 (0.055)	137717 2006/7006724 RCN R05136 METCON_149 Max. frozen storage: 7.9 month
Canada, 2005, Innisfail, AB (AC Lu)	2 × 0.11	7	226 234	85	21	Straw	0.060 0.070 (0.065)	0.050 0.060 (0.055)	< 0.01 0.01 (0.010)	137717 2006/7006724 RCN R05137 METCON_149 Max. frozen

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
										storage: 7.1 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] Residues of metabolites M11, M21 and M30 are expressed as parent equivalent (conversion factors 0.95, 0.95 and 0.96, respectively). For calculations, 0.01 mg/kg was used for residues below or at the LOQ for metabolites M11, M21 and M30.

Maize forage

A total of 25 field trials were conducted on maize and sweet corn in the USA during the 2006 growing season (Carringer, 2006, METCON_150). Plants received 4 foliar applications of metconazole at nominal rates of 110 g ai/ha. Maize forage was harvested at 6–7 days after the last application for the sweet corn trials and at the late dough/early dent stage for the maize trials. Residues of cis- and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0604. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.01 mg/kg or 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of <20%.

Table 215 Residues of *cis*- and *trans*-metconazole in maize forage following foliar treatment (cGAP USA: 4 × 92 g ai/ha; 7 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2006, South Sodus, NY (Speedy sweet)	4× 0.11	6–8	290 281 281 281	59–71	7	Forage	0.02 0.03 (0.03)	0.01 0.01 (0.01)	0.03 0.04 (0.04)	254314 2006/7012839 RCN R06425 METCON_150 Max. frozen storage: 3.0 month
USA, 2006, Germansville, PA (TA5750)	4× 0.11	6–7	290 290 281 290	Milk stage	7	Forage	0.71 0.66 (0.69)	0.13 0.14 (0.14)	0.83 0.80 (0.82)	254314 2006/7012839 RCN R06426 METCON_150 Max. frozen storage: 3.4 month
USA, 2006, Seven Springs, NC (Garst 8377)	4× 0.11	6–8	150 159 196 281	67	7	Forage	1.5 1.4 (1.5)	0.44 0.45 (0.45)	1.9 1.8 (1.9)	254314 2006/7012839 RCN R06427 METCON_150 Max. frozen storage: 5.2 month
USA, 2006, O'Brien, FL (8102 R Bicolor)	4× 0.11	7	215 224 224 234	75	7	Forage	0.89 1.00 (0.95)	0.19 0.21 (0.20)	1.1 1.2 (1.2)	254314 2006/7012839 RCN R06428 METCON_150 Max. frozen storage: 2.1 month
USA, 2006, New Holland, OH	4× 0.11	6–7	196 196	73	7	Forage	0.010 0.010	0.090 0.090	0.10 0.10	254314 2006/7012839 RCN R06429

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
(Crows 7R154)			196 206				(0.010)	(0.090)	(0.10)	METCON_150 Max. frozen storage: 3.7 month
USA, 2006, Atlanta, OH (Crows 5151)	4× 0.11	6–8	150 150 150 150	85	7	Forage	1.2 1.2 (1.2)	0.30 0.27 (0.29)	1.5 1.5 (1.5)	254314 2006/7012839 RCN R06430 METCON_150 Max. frozen storage: 3.0 month
USA, 2006, Carlyle, IL, (BT 6516 RR 2YG)	4× 0.11	7	168 159 178 168	R3-R4	7	Forage	0.36 0.36 (0.36)	0.17 0.17 (0.17)	0.53 0.53 (0.53)	254314 2006/7012839 RCN R06431 METCON_150 Max. frozen storage: 3.7 month
USA, 2006, Mason, IL, (Burrus 664 RWR-PX4)	4× 0.11	6–8	159 150 150 159	85	7	Forage	0.20 0.29 (0.25)	0.96 1.1 (1.0)	1.2 1.3 (1.3)	254314 2006/7012839 RCN R06432 METCON_150 Max. frozen storage: 3.2 month
USA, 2006, Wyoming, IL, (Burrus 644 RWR)	4× 0.11	6–8	131 131 131 150	R3	6	Forage	0.02 0.01 (0.02)	0.17 0.13 (0.15)	0.19 0.14 (0.17)	254314 2006/7012839 RCN R06433 METCON_150 Max. frozen storage: 3.5 month
USA, 2006, Danville, IN (Wyffels W5531)	4× 0.11	6–8	178 159 150 140	83	7	Forage	1.2 0.88 (1.0)	0.13 0.17 (0.15)	1.3 1.1 (1.2)	254314 2006/7012839 RCN R06434 METCON_150 Max. frozen storage: 3.4 month
USA, 2006, Bellmore, IN (Wyffels W5531)	4× 0.11	7	178 159 168 150	71–73	7	Forage	0.90 0.76 (0.83)	0.06 0.09 (0.08)	0.96 0.85 (0.91)	254314 2006/7012839 RCN R06435 METCON_150 Max. frozen storage: 3.4 month
USA, 2006, Richland, IO (Golden Harvest HX 9323)	4× 0.11	7	150 122 131 178	R4	7	Forage	0.31 0.45 (0.38)	0.07 0.11 (0.09)	0.38 0.57 (0.48)	254314 2006/7012839 RCN R06436 METCON_150 Max. frozen storage: 3.4 month
USA, 2006, Hedrick, IO (Pioneer	4× 0.11	6–7	150 150 150	R4	7	Forage	0.45 0.32 (0.39)	0.11 0.16 (0.14)	0.56 0.48 (0.52)	254314 2006/7012839 RCN R06437

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
34A16)			159							METCON_150 Max. frozen storage: 3.4 month
USA, 2006, Ollie, IO (Middlekoop 2212)	4× 0.11	7–8	159 122 131 168	R4	7	Forage	0.95 0.66 (0.81)	0.14 0.19 (0.17)	1.1 0.85 (0.97)	254314 2006/7012839 RCN R06438 METCON_150 Max. frozen storage: 3.7 month
USA, 2006, Bagley, IO (33P65)	4× 0.11	7	187 196 206 206	75	7	Forage	0.73 0.65 (0.69)	0.10 0.11 (0.11)	0.83 0.76 (0.80)	254314 2006/7012839 RCN R06439 METCON_150 Max. frozen storage: 3.7month
USA, 2006 Delavan, WI (DKC52–40 (RR2/YGPL))	4× 0.11	5–7	178 168 168 159	R3	7	Forage	1.0 0.92 (0.97)	0.19 0.17 (0.18)	1.2 1.1 (1.2)	254314 2006/7012839 RCN R06440 METCON_150 Max. frozen storage: 3.1 month
USA, 2006 Ellendale, MN (Pioneer 38H66)	4× 0.11	6–8	150 159 159 159	R4	7	Forage	0.96 1.1 (1.0)	0.18 0.30 (0.24)	1.1 1.4 (1.3)	254314 2006/7012839 RCN R06441 METCON_150 Max. frozen storage: 3.2 month
USA, 2006 Geneva, MN (Pioneer 38H66)	4× 0.11	6–8	150 159 159 159	R4	7	Forage	0.92 0.84 (0.88)	0.18 0.16 (0.17)	1.1 1.0 (1.1)	254314 2006/7012839 RCN R06442 METCON_150 Max. frozen storage: 3.2 month
USA, 2006 York, NE (Pioneer 34N45 RR/YG)	4× 0.11	6–8	187 178 187 187	85	7	Forage	0.01 0.01 (0.01)	0.09 0.10 (0.10)	0.10 0.11 (0.11)	254314 2006/7012839 RCN R06443 METCON_150 Max. frozen storage: 3.6 month
USA, 2006, Grand Island, NE (NK N73-F7 RR/LL/YG)	4× 0.11	6–8	187 178 178 187	85	7	Forage	0.01 0.01 (0.01)	0.09 0.08 (0.090	0.10 0.09 (0.10)	254314 2006/7012839 RCN R06444 METCON_150 Max. frozen storage: 3.2 month

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2006, Osceola, NE (NK N73-F7)	4× 0.11	6–8	187	85	7	Forage	0.01	0.08	0.09	254314
			187				0.01	0.07	0.08	2006/7012839
			187				(0.01)	(0.08)	(0.09)	RCN R06445
			187							METCON_150
										Max. frozen storage: 3.6 month
USA, 2006, Dill, OK (DK C48–53 AF2)	4× 0.11	6–8	187	87	21	Forage	1.8	0.13	2.0	254314
			187				1.5	0.16	1.6	2006/7012839
			206				(1.6)	(0.15)	(1.8)	RCN R06446
			196							METCON_150
										Max. frozen storage: 3.1 month
USA, 2006, Porterville, CA (Bodacious)	4× 0.11	7–8	290	78	7	Forage	2.2	0.46	2.6	254314
			290				2.2	0.54	2.7	2006/7012839
			290				(2.2)	(0.50)	(2.7)	RCN R06447
			290							METCON_150
										Max. frozen storage: 4.2 month
USA, 2006, Ephrata, WA (Golden Jubilee)	4× 0.11	7	140	73	7	Forage	0.02	0.14	0.16	254314
			140				0.02	0.20	0.22	2006/7012839
			140				(0.02)	(0.17)	(0.19)	RCN R06448
			140							METCON_150
										Max. frozen storage: 3.8 month
USA, 2006, Corvallis, OR (Super Sweet Jubilee Plus)	4× 0.11	7	122	73	7	Forage	1.0	0.17	1.2	254314
			122				0.91	0.16	1.1	2006/7012839
			122				(0.96)	(0.17)	(1.2)	RCN R06449
			122							METCON_150
										Max. frozen storage: 3.1 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 216 Residues of metabolites M11, M21 and M30 in maize forage following foliar treatment (cGAP USA: 4 × 92 g ai/ha; 7 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
USA, 2006, South Sodus, NY (Speedy sweet)	4× 0.11	6–8	290	59–71	7	Forage	< 0.01	0.02	< 0.01	254314
			281				< 0.01	0.03	< 0.01	2006/7012839
			281				(< 0.01)	(0.03)	(< 0.01)	RCN R06425
			281							METCON_150
										Max. frozen storage: 3.0 month
USA, 2006, Germansville, PA	4× 0.11	6–7	290	Milk	7	Forage	< 0.01	0.040	< 0.01	254314
			290	stage			0.02	0.060	< 0.01	2006/7012839

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				M11	M21	M30	
(TA5750)			281 290				(0.02)	(0.050)	(< 0.01)	RCN R06426 METCON_150 Max. frozen storage: 3.4 month
USA, 2006, Seven Springs, NC (Garst 8377)	4× 0.11	6–8	150 159 196 281	67	7	Forage	0.02 0.03 (0.03)	0.04 0.04 (0.04)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06427 METCON_150 Max. frozen storage: 5.2 month
USA, 2006, O'Brien, FL (8102 R Bicolor)	4× 0.11	7	215 224 224 234	75	7	Forage	0.02 0.02 (0.02)	0.04 0.04 (0.04)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06428 METCON_150 Max. frozen storage: 2.1 month
USA, 2006, New Holland, OH (Crows 7R154)	4× 0.11	6–7	196 196 196 206	73	7	Forage	0.02 0.03 (0.03)	0.02 0.02 (0.02)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06429 METCON_150 Max. frozen storage: 3.7 month
USA, 2006, Atlanta, OH (Crows 5151)	4× 0.11	6–8	150 150 150 150	85	7	Forage	0.20 0.19 (0.20)	0.05 0.05 (0.05)	0.03 0.03 (0.03)	254314 2006/7012839 RCN R06430 METCON_150 Max. frozen storage: 3.0 month
USA, 2006, Carlyle, IL, (BT 6516 RR 2YG)	4× 0.11	7	168 159 178 168	R3-R4	7	Forage	0.04 0.05 (0.05)	0.02 0.03 (0.03)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06431 METCON_150 Max. frozen storage: 3.7 month
USA, 2006, Mason, IL, (Burrus 664 RWR-PX4)	4× 0.11	6–8	159 150 150 159	85	7	Forage	0.13 0.11 (0.12)	0.04 0.04 (0.04)	0.02 0.02 (0.02)	254314 2006/7012839 RCN R06432 METCON_150 Max. frozen storage: 3.2 month
USA, 2006, Wyoming, IL, (Burrus 644 RWR)	4× 0.11	6–8	131 131 131 150	R3	6	Forage	0.04 0.04 (0.04)	0.04 0.04 (0.04)	0.01 0.01 (0.01)	254314 2006/7012839 RCN R06433 METCON_150 Max. frozen storage: 3.5 month
USA, 2006, Danville, IN (Wyffels W5531)	4× 0.11	6–8	178 159 150 140	83	7	Forage	0.03 0.04 (0.04)	0.03 0.03 (0.03)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06434 METCON_150 Max. frozen

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				M11	M21	M30	
										storage: 3.4 month
USA, 2006, Bellmore, IN (Wyffels W5531)	4× 0.11	7	178 159 168 150	71–73	7	Forage	0.02 0.02 (0.02)	0.03 0.04 (0.04)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06435 METCON_150 Max. frozen storage: 3.4 month
USA, 2006, Richland, IO (Golden Harvest HX 9323)	4× 0.11	7	150 122 131 178	R4	7	Forage	0.03 0.05 (0.04)	0.02 0.02 (0.02)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06436 METCON_150 Max. frozen storage: 3.4 month
USA, 2006, Hedrick, IO (Pioneer 34A16)	4× 0.11	6–7	150 150 150 159	R4	7	Forage	0.04 0.06 (0.05)	0.01 0.02 (0.02)	< 0.01 0.01 (0.01)	254314 2006/7012839 RCN R06437 METCON_150 Max. frozen storage: 3.4 month
USA, 2006, Ollie, IO (Middlekoop 2212)	4× 0.11	7–8	159 122 131 168	R4	7	Forage	0.02 0.02 (0.02)	0.03 0.04 (0.04)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06438 METCON_150 Max. frozen storage: 3.7 month
USA, 2006, Bagley, IO (33P65)	4× 0.11	7	187 196 206 206	75	7	Forage	0.02 0.02 (0.02)	0.03 0.02 (0.03)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06439 METCON_150 Max. frozen storage: 3.7month
USA, 2006 Delavan, WI (DKC52–40 (RR2/YGPL))	4× 0.11	5–7	178 168 168 159	R3	7	Forage	0.03 0.04 (0.04)	0.04 0.03 (0.04)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06440 METCON_150 Max. frozen storage: 3.1 month
USA, 2006 Ellendale, MN (Pioneer 38H66)	4× 0.11	6–8	150 159 159 159	R4	7	Forage	0.05 0.07 (0.06)	0.03 0.03 (0.03)	0.01 0.01 (0.01)	254314 2006/7012839 RCN R06441 METCON_150 Max. frozen storage: 3.2 month
USA, 2006 Geneva, MN (Pioneer	4× 0.11	6–8	150 159	R4	7	Forage	0.04 0.05	0.02 0.02	0.01 0.02	254314 2006/7012839

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				M11	M21	M30	
38H66)			159 159				(0.05)	(0.02)	(0.02)	RCN R06442 METCON_150 Max. frozen storage: 3.2 month
USA, 2006 York, NE (Pioneer 34N45 RR/YG)	4× 0.11	6–8	187 178 187 187	85	7	Forage	0.05 0.06 (0.06)	0.02 0.02 (0.02)	0.01 0.02 (0.02)	254314 2006/7012839 RCN R06443 METCON_150 Max. frozen storage: 3.6 month
USA, 2006, Grand Island, NE (NK N73-F7 RR/LL/YG)	4× 0.11	6–8	187 178 178 187	85	7	Forage	0.05 0.05 (0.05)	0.02 0.01 (0.02)	0.01 0.01 (0.01)	254314 2006/7012839 RCN R06444 METCON_150 Max. frozen storage: 3.2 month
USA, 2006, Osceola, NE (NK N73-F7)	4× 0.11	6–8	187 187 187 187	85	7	Forage	0.06 0.04 (0.05)	0.01 < 0.01 (0.01)	0.02 0.01 (0.02)	254314 2006/7012839 RCN R06445 METCON_150 Max. frozen storage: 3.6 month
USA, 2006, Dill, OK (DK C48–53 AF2)	4× 0.11	6–8	187 187 206 196	87	21	Forage	0.08 0.09 (0.09)	0.02 0.02 (0.02)	0.02 0.02 (0.02)	254314 2006/7012839 RCN R06446 METCON_150 Max. frozen storage: 3.1 month
USA, 2006, Porterville, CA (Bodacious)	4× 0.11	7–8	290 290 290 290	78	7	Forage	0.01 0.02 (0.02)	0.04 0.04 (0.04)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06447 METCON_150 Max. frozen storage: 4.2 month
USA, 2006, Ephrata, WA (Golden Jubilee)	4× 0.11	7	140 140 140 140	73	7	Forage	< 0.01 < 0.01 (< 0.01)	0.01 0.02 (0.02)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06448 METCON_150 Max. frozen storage: 3.8 month
USA, 2006, Corvallis, OR (Super Sweet Jubilee Plus)	4× 0.11	7	122 122 122 122	73	7	Forage	0.02 0.03 (0.03)	0.02 0.02 (0.02)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06449 METCON_150 Max. frozen

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
										storage: 3.1 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] Residues of metabolites M11, M21 and M30 are expressed as parent equivalent (conversion factors 0.95, 0.95 and 0.96, respectively). For calculations, 0.01 mg/kg was used for residues below or at the LOQ for metabolites M11, M21 and M30.

Table 217 Residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), and triazolyl acetic acid (TAA) in maize forage following foliar treatment (cGAP USA: 4 × 92 g ai/ha; 7 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] T	TA	TAA	Report/Trial No., Reference, Storage period
USA, 2006, South Sodus, NY (Speedy sweet)	4× 0.11	6–8	290	59–71	7	Forage	< 0.05	0.06	< 0.05	254314
			281				< 0.05	0.08	< 0.05	2006/7012839
			281				(< 0.05)	(0.07)	(< 0.05)	RCN R06425
			281							METCON_150
										Max. frozen
										storage: 3.0 month
USA, 2006, Germansville, PA (TA5750)	4× 0.11	6–7	290	Milk	7	Forage	< 0.05	< 0.05	< 0.05	254314
			290	stage			< 0.05	< 0.05	< 0.05	2006/7012839
			281				(< 0.05)	(< 0.05)	(< 0.05)	RCN R06426
			290							METCON_150
										Max. frozen
										storage: 3.4 month
USA, 2006, Seven Springs, NC (Garst 8377)	4× 0.11	6–8	150	67	7	Forage	< 0.05	< 0.05	< 0.05	254314 2006/7012839
			159				< 0.05	< 0.05	< 0.05	RCN R06427
			196				(< 0.05)	(< 0.05)	(< 0.05)	METCON_150
			281							Max. frozen
										storage: 5.2 month
USA, 2006, O'Brien, FL (8102 R Bicolor)	4× 0.11	7	215	75	7	Forage	< 0.05	0.12	< 0.05	254314 2006/7012839
			224				< 0.05	0.12	< 0.05	RCN R06428
			224				(< 0.05)	(0.12)	(< 0.05)	METCON_150
			234							Max. frozen
										storage: 2.1 month
USA, 2006, New Holland, OH (Crows 7R154)	4× 0.11	6–7	196	73	7	Forage	< 0.05	< 0.05	< 0.05	254314 2006/7012839
			196				< 0.05	< 0.05	< 0.05	RCN R06429
			196				(< 0.05)	(< 0.05)	(< 0.05)	METCON_150
			206							Max. frozen
										storage: 3.7 month
USA, 2006, Atlanta, OH (Crows 5151)	4× 0.11	6–8	150	85	7	Forage	< 0.05	< 0.05	< 0.05	254314 2006/7012839
			150				< 0.05	< 0.05	< 0.05	RCN R06430
			150				(< 0.05)	(< 0.05)	(< 0.05)	METCON_150
			150							Max. frozen
										storage: 3.0 month

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] T	TA	TAA	Report/Trial No., Reference, Storage period
USA, 2006, Carlyle, IL, (BT 6516 RR 2YG)	4× 0.11	7	168	R3-R4	7	Forage	< 0.05	< 0.05	< 0.05	254314 2006/7012839
			159				< 0.05	< 0.05	< 0.05	RCN R06431
			178				(< 0.05)	(< 0.05)	(< 0.05)	METCON_150
			168							Max. frozen
										storage: 3.7
										month
USA, 2006, Mason, IL, (Burrus 664 RWR-PX4)	4× 0.11	6–8	159	85	7	Forage	< 0.05	0.06	< 0.05	254314 2006/7012839
			150				< 0.05	0.07	< 0.05	RCN R06432
			150				(< 0.05)	(0.07)	(< 0.05)	METCON_150
			159							Max. frozen
										storage: 3.2
										month
USA, 2006, Wyoming, IL, (Burrus 644 RWR)	4× 0.11	6–8	131	R3	6	Forage	< 0.05	< 0.05	< 0.05	254314 2006/7012839
			131				< 0.05	< 0.05	< 0.05	RCN R06433
			131				(< 0.05)	(< 0.05)	(< 0.05)	METCON_150
			150							Max. frozen
										storage: 3.5
										month
USA, 2006, Danville, IN (Wyffels W5531)	4× 0.11	6–8	178	83	7	Forage	< 0.05	0.08	< 0.05	254314
			159				< 0.05	0.06	< 0.05	2006/7012839
			150				(< 0.05)	(0.07)	(< 0.05)	RCN R06434
			140							METCON_150
										Max. frozen
										storage: 3.4 month
USA, 2006, Bellmore, IN (Wyffels W5531)	4× 0.11	7	178	71–73	7	Forage	< 0.05	< 0.05	< 0.05	254314
			159				0.08	0.08	< 0.05	2006/7012839
			168				(0.07)	(0.08)	(< 0.05)	RCN R06435
			150							METCON_150
										Max. frozen
										storage: 3.4 month
USA, 2006, Richland, IO (Golden Harvest HX 9323)	4× 0.11	7	150	R4	7	Forage	< 0.05	< 0.05	< 0.05	254314
			122				< 0.05	< 0.05	< 0.05	2006/7012839
			131				(< 0.05)	(< 0.05)	(< 0.05)	RCN R06436
			178							METCON_150
										Max. frozen
										storage: 3.4 month
USA, 2006, Hedrick, IO (Pioneer 34A16)	4× 0.11	6–7	150	R4	7	Forage	< 0.05	0.08	< 0.05	254314
			150				< 0.05	0.06	< 0.05	2006/7012839
			150				(< 0.05)	(0.07)	(< 0.05)	RCN R06437
			159							METCON_150
										Max. frozen
										storage: 3.4 month
USA, 2006, Ollie, IO (Middlekoop 2212)	4× 0.11	7–8	159	R4	7	Forage	< 0.05	0.06	< 0.05	254314
			122				< 0.05	< 0.05	< 0.05	2006/7012839
			131				(< 0.05)	(0.06)	(< 0.05)	RCN R06438
			168							METCON_150
										Max. frozen

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				T	TA	TAA	
										storage: 3.7 month
USA, 2006, Bagley, IO (33P65)	4× 0.11	7	187	75	7	Forage	< 0.05	0.05	< 0.05	254314
			196				< 0.05	< 0.05	< 0.05	2006/7012839
			206				(< 0.05)	(< 0.05)	(< 0.05)	RCN R06439
			206							METCON_150
										Max. frozen
										storage: 3.7month
USA, 2006 Delavan, WI (DKC52–40 (RR2/YGPL))	4× 0.11	5–7	178	R3	7	Forage	< 0.05	< 0.05	< 0.05	254314
			168				< 0.05	< 0.05	< 0.05	2006/7012839
			168				(< 0.05)	(< 0.05)	(< 0.05)	RCN R06440
			159							METCON_150
										Max. frozen
										storage: 3.1 month
USA, 2006 Ellendale, MN (Pioneer 38H66)	4× 0.11	6–8	150	R4	7	Forage	< 0.05	< 0.05	< 0.05	254314
			159				< 0.05	< 0.05	< 0.05	2006/7012839
			159				(< 0.05)	(< 0.05)	(< 0.05)	RCN R06441
			159							METCON_150
										Max. frozen
										storage: 3.2 month
USA, 2006 Geneva, MN (Pioneer 38H66)	4× 0.11	6–8	150	R4	7	Forage	< 0.05	0.09	< 0.05	254314
			159				< 0.05	0.10	< 0.05	2006/7012839
			159				(< 0.05)	(0.10)	(< 0.05)	RCN R06442
			159							METCON_150
										Max. frozen
										storage: 3.2 month
USA, 2006 York, NE (Pioneer 34N45 RR/YG)	4× 0.11	6–8	187	85	7	Forage	< 0.05	0.06	< 0.05	254314
			178				< 0.05	0.05	< 0.05	2006/7012839
			187				(< 0.05)	(0.06)	(< 0.05)	RCN R06443
			187							METCON_150
										Max. frozen
										storage: 3.6 month
USA, 2006, Grand Island, NE (NK N73-F7 RR/LL/YG)	4× 0.11	6–8	187	85	7	Forage	< 0.05	0.06	< 0.05	254314
			178				< 0.05	< 0.05	< 0.05	2006/7012839
			178				(< 0.05)	(0.06)	(< 0.05)	RCN R06444
			187							METCON_150
										Max. frozen
										storage: 3.2 month
USA, 2006, Osceola, NE (NK N73-F7)	4× 0.11	6–8	187	85	7	Forage	< 0.05	0.12	< 0.05	254314
			187				< 0.05	0.13	< 0.05	2006/7012839
			187				(< 0.05)	(0.12)	(< 0.05)	RCN R06445
			187							METCON_150
										Max. frozen
										storage: 3.6 month
USA, 2006, Dill, OK (DK C48–53	4× 0.11	6–8	187	87	21	Forage	< 0.05	< 0.05	< 0.05	254314
			187				< 0.05	< 0.05	< 0.05	2006/7012839

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] T	TA	TAA	Report/Trial No., Reference, Storage period
AF2)			206				(< 0.05)	(< 0.05)	(< 0.05)	RCN R06446
			196							METCON_150
										Max. frozen
										storage: 3.1 month
USA, 2006, Porterville, CA (Bodacious)	4× 0.11	7–8	290	78	7	Forage	< 0.05	< 0.05	< 0.05	254314
			290				< 0.05	< 0.05	< 0.05	2006/7012839
			290				(< 0.05)	(< 0.05)	(< 0.05)	RCN R06447
			290							METCON_150
										Max. frozen
										storage: 4.2 month
USA, 2006, Ephrata, WA (Golden Jubilee)	4× 0.11	7	140	73	7	Forage	< 0.05	< 0.05	< 0.05	254314
			140				< 0.05	< 0.05	< 0.05	2006/7012839
			140				(< 0.05)	(< 0.05)	(< 0.05)	RCN R06448
			140							METCON_150
										Max. frozen
										storage: 3.8 month
USA, 2006, Corvallis, OR (Super Sweet Jubilee Plus)	4× 0.11	7	122	73	7	Forage	< 0.05	0.08	< 0.05	254314
			122				< 0.05	0.07	< 0.05	2006/7012839
			122				(< 0.05)	(0.08)	(< 0.05)	RCN R06449
			122					Control:		METCON_150
								0.07		Max. frozen
										storage: 3.1 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Maize stover

A total of 20 field trials were conducted on maize in the USA during the 2006 growing season (Carringer, 2006, METCON_150). Plants received 4 foliar applications of metconazole at nominal rates of 110 g ai/ha. Maize stover was collected at 20–22 days after the last application. Residues of cis- and trans-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0604. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.01 mg/kg or 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of < 20%.

Table 218 Residues of *cis*- and *trans*-metconazole in maize stover following foliar treatment (cGAP USA: 4 × 92 g ai/ha; 20 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2006, Germansville, PA (TA5750)	4× 0.11	7	290	87	21	Stover	0.74	0.18	0.93	254314
			290				1.0	0.36	1.4	2006/7012839
			281				(0.88)	(0.27)	(1.2)	RCN R06426
			290							METCON_150
										Max. frozen
										storage: 2.5 month

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2006, Seven Springs, NC (Garst 8377)	4× 0.11	7	271 271 271 271	87	21	Stover	0.11 0.11 (0.11)	0.03 0.03 (0.03)	0.14 0.14 (0.14)	254314 2006/7012839 RCN R06427 METCON_150 Max. frozen storage: 3.3 month
USA, 2006, New Holland, OH (Crows 7R154)	4× 0.11	6–9	196 196 206 196	87	20	Stover	1.7 1.7 (1.7)	0.34 0.39 (0.37)	2.0 2.0 (2.0)	254314 2006/7012839 RCN R06429 METCON_150 Max. frozen storage: 2.7 month
USA, 2006, Atlanta, OH (Crows 5151)	4× 0.11	6–9	150 150 150 150	87	20	Stover	1.2 1.5 (1.3)	0.21 0.35 (0.28)	1.4 1.8 (1.6)	254314 2006/7012839 RCN R06430 METCON_150 Max. frozen storage: 2.2 month
USA, 2006, Carlyle, IL, (BT 6516 RR 2YG)	4× 0.11	7	131 215 224 178	R6	21	Stover	2.6 1.9 (2.2)	0.54 0.37 (0.46)	3.1 2.2 (2.7)	254314 2006/7012839 RCN R06431 METCON_150 Max. frozen storage: 3.0 month
USA, 2006, Mason, IL, (Burrus 664 RWR-PX4)	4× 0.11	6–8	159 140 159 159	87–89	21	Stover	1.2 1.1 (1.2)	0.22 0.21 (0.22)	1.4 1.4 (1.4)	254314 2006/7012839 RCN R06432 METCON_150 Max. frozen storage: 3.2 month
USA, 2006, Wyoming, IL, (Burrus 644 RWR)	4× 0.11	6–7	159 159 159 150	R5	22	Stover	1.6 1.8 (1.7)	0.37 0.43 (0.40)	2.0 2.2 (2.1)	254314 2006/7012839 RCN R06433 METCON_150 Max. frozen storage: 2.2 month
USA, 2006, Danville, IN (Wyffels W5531)	4× 0.11	7	140 140 150 159	87–89	21	Stover	1.1 1.9 (1.5)	0.21 0.39 (0.30)	1.3 2.3 (1.8)	254314 2006/7012839 RCN R06434 METCON_150 Max. frozen storage: 3.2 month
USA, 2006, Bellmore, IN (Wyffels W5531)	4× 0.11	6–8	159 159 159 159	87	21	Stover	2.8 2.4 (2.6)	0.69 0.54 (0.62)	3.5 2.9 (3.2)	254314 2006/7012839 RCN R06435 METCON_150 Max. frozen storage: 2.0 month
USA, 2006, Richland,	4× 0.11	7	150	R5	21	Stover	1.1	0.32	1.5	254314

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
IO (Golden Harvest HX 9323)			150 150 178				1.2 (1.2)	0.32 (0.32)	1.5 (1.5)	2006/7012839 RCN R06436 METCON_150 Max. frozen storage: 2.5 month
USA, 2006, Hedrick, IO (Pioneer 34A16)	4× 0.11	7–8	159 159 159 140	R5	21	Stover	1.3 1.7 (1.5)	0.19 0.35 (0.27)	1.5 2.0 (1.8)	254314 2006/7012839 RCN R06437 METCON_150 Max. frozen storage: 3.3 month
USA, 2006, Ollie, IO (Middlekoop 2212)	4× 0.11	7	159 150 159 178	R5	21	Stover	2.2 1.7 (1.9)	0.44 0.34 (0.39)	2.6 2.0 (2.3)	254314 2006/7012839 RCN R06438 METCON_150 Max. frozen storage: 3.0 month
USA, 2006, Bagley, IO (33P65)	4× 0.11	7	206 206 224 215	85	21	Stover	1.9 1.4 (1.6)	0.37 0.22 (0.30)	2.3 1.6 (1.9)	254314 2006/7012839 RCN R06439 METCON_150 Max. frozen storage: 2.5 month
USA, 2006 Delavan, WI (DKC52–40 (RR2/YGPL))	4× 0.11	6–7	159 159 168 159	R5	21	Stover	1.2 1.8 (1.5)	0.22 0.33 (0.28)	1.4 2.1 (1.8)	254314 2006/7012839 RCN R06440 METCON_150 Max. frozen storage: 2.3 month
USA, 2006 Ellendale, MN (Pioneer 38H66)	4× 0.11	6–7	159 150 168 159	R5/R6	21	Stover	2.1 2.4 (2.3)	0.47 0.48 (0.48)	2.6 2.8 (2.7)	254314 2006/7012839 RCN R06441 METCON_150 Max. frozen storage: 2.3 month
USA, 2006 Geneva, MN (Pioneer 38H66)	4× 0.11	6–7	159 159 168 159	R5/R6	21	Stover	1.8 1.3 (1.6)	0.41 0.28 (0.35)	2.3 1.6 (1.9)	254314 2006/7012839 RCN R06442 METCON_150 Max. frozen storage: 2.3 month
USA, 2006 York, NE (Pioneer 34N45 RR/YG)	4× 0.11	6–7	187 187 187 187	87	21	Stover	1.4 1.2 (1.3)	0.22 0.20 (0.21)	1.6 1.4 (1.5)	254314 2006/7012839 RCN R06443 METCON_150 Max. frozen

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
										storage: 3.5 month
USA, 2006, Grand Island, NE (NK N73-F7 RR/LL/YG)	4× 0.11	7	178 187 187 187	87	21	Stover	0.84 0.73 (0.79)	0.16 0.14 (0.15)	1.0 0.88 (0.94)	254314 2006/7012839 RCN R06444 METCON_150 Max. frozen storage: 3.0 month
USA, 2006, Osceola, NE (NK N73-F7)	4× 0.11	6–8	187 187 187 187	87	21	Stover	1.6 1.8 (1.7)	0.32 0.34 (0.33)	1.9 2.1 (2.0)	254314 2006/7012839 RCN R06445 METCON_150 Max. frozen storage: 3.5 month
USA, 2006, Dill, OK (DK C48–53 AF2)	4× 0.11	6–9	196 206 196 196	87	21	Stover	1.7 2.4 (2.0)	0.35 0.45 (0.40)	2.1 2.8 (2.5)	254314 2006/7012839 RCN R06446 METCON_150 Max. frozen storage: 2.5 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 219 Residues of metabolites M11, M21 and M30 in maize stover following foliar treatment (cGAP USA: 4 × 92 g ai/ha; 20 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
USA, 2006, Germansville, PA (TA5750)	4× 0.11	7	290 290 281 290	87	21	Stover	0.09 0.07 0.08	0.03 0.04 0.04	0.01 0.01 0.01	254314 2006/7012839 RCN R06426 METCON_150 Max. frozen storage: 2.5 month
USA, 2006, Seven Springs, NC (Garst 8377)	4× 0.11	7	271 271 271 271	87	21	Stover	0.10 0.11 (0.11)	0.03 0.03 (0.03)	0.05 0.04 (0.05)	254314 2006/7012839 RCN R06427 METCON_150 Max. frozen storage: 3.3 month
USA, 2006, New Holland, OH (Crows 7R154)	4× 0.11	6–9	196 196 206 196	87	20	Stover	0.48 0.47 (0.48)	0.14 0.13 (0.14)	0.07 0.06 (0.07)	254314 2006/7012839 RCN R06429 METCON_150 Max. frozen storage: 2.7 month
USA, 2006, Atlanta, OH (Crows 5151)	4× 0.11	6–9	150 150	87	20	Stover	0.43 0.49	0.07 0.08	0.05 0.06	254314 2006/7012839 RCN R06430

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				M11	M21	M30	
			150 150				(0.46)	(0.08)	(0.06)	METCON_150 Max. frozen storage: 2.2 month
USA, 2006, Carlyle, IL, (BT 6516 RR 2YG)	4× 0.11	7	131 215 224 178	R6	21	Stover	2.4 1.7 (2.0)	0.40 0.34 (0.37)	0.30 0.27 (0.29)	254314 2006/7012839 RCN R06431 METCON_150 Max. frozen storage: 3.0 month
USA, 2006, Mason, IL, (Burrus 664 RWR-PX4)	4× 0.11	6–8	159 140 159 159	87–89	21	Stover	0.26 0.34 (0.30)	0.09 0.11 (0.10)	0.05 0.06 (0.06)	254314 2006/7012839 RCN R06432 METCON_150 Max. frozen storage: 3.2 month
USA, 2006, Wyoming, IL, (Burrus 644 RWR)	4× 0.11	6–7	159 159 159 150	R5	22	Stover	0.16 0.17 (0.17)	0.05 0.05 (0.05)	0.03 0.03 (0.03)	254314 2006/7012839 RCN R06433 METCON_150 Max. frozen storage: 2.2 month
USA, 2006, Danville, IN (Wyffels W5531)	4× 0.11	7	140 140 150 159	87–89	21	Stover	0.32 0.50 (0.41)	0.14 0.21 (0.18)	0.07 0.08 (0.08)	254314 2006/7012839 RCN R06434 METCON_150 Max. frozen storage: 3.2 month
USA, 2006, Bellmore, IN (Wyffels W5531)	4× 0.11	6–8	159 159 159 159	87	21	Stover	0.47 0.38 (0.43)	0.13 0.09 (0.11)	0.06 0.05 (0.06)	254314 2006/7012839 RCN R06435 METCON_150 Max. frozen storage: 2.0 month
USA, 2006, Richland, IO (Golden Harvest HX 9323)	4× 0.11	7	150 150 150 178	R5	21	Stover	0.36 0.32 (0.34)	0.05 0.07 (0.06)	0.04 0.05 (0.05)	254314 2006/7012839 RCN R06436 METCON_150 Max. frozen storage: 2.5 month
USA, 2006, Hedrick, IO (Pioneer 34A16)	4× 0.11	7–8	159 159 159 140	R5	21	Stover	0.14 0.26 (0.20)	0.07 0.09 (0.08)	0.03 0.04 (0.04)	254314 2006/7012839 RCN R06437 METCON_150 Max. frozen storage: 3.3 month
USA, 2006, Ollie, IO	4× 0.11	7	159 150	R5	21	Stover	0.14 0.12	0.09 0.08	0.03 0.03	254314 2006/7012839

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
(Middlekoop 2212)			159 178				(0.13)	(0.09)	(0.03)	RCN R06438 METCON_150 Max. frozen storage: 3.0 month
USA, 2006, Bagley, IO (33P65)	4× 0.11	7	206 206 224 215	85	21	Stover	0.16 0.12 (0.14)	0.07 0.06 (0.07)	0.03 0.02 (0.03)	254314 2006/7012839 RCN R06439 METCON_150 Max. frozen storage: 2.5 month
USA, 2006 Delavan, WI (DKC52–40 (RR2/YGPL))	4× 0.11	6–7	159 159 168 159	R5	21	Stover	0.15 0.23 (0.19)	0.06 0.08 (0.07)	0.02 0.03 (0.03)	254314 2006/7012839 RCN R06440 METCON_150 Max. frozen storage: 2.3 month
USA, 2006 Ellendale, MN (Pioneer 38H66)	4× 0.11	6–7	159 150 168 159	R5/R6	21	Stover	0.51 0.55 (0.53)	0.06 0.07 (0.07)	0.05 0.05 (0.05)	254314 2006/7012839 RCN R06441 METCON_150 Max. frozen storage: 2.3 month
USA, 2006 Geneva, MN (Pioneer 38H66)	4× 0.11	6–7	159 159 168 159	R5/R6	21	Stover	0.31 0.27 (0.29)	0.05 0.04 (0.05)	0.04 0.03 (0.04)	254314 2006/7012839 RCN R06442 METCON_150 Max. frozen storage: 2.3 month
USA, 2006 York, NE (Pioneer 34N45 RR/YG)	4× 0.11	6–7	187 187 187 187	87	21	Stover	0.15 0.16 (0.16)	0.08 0.07 (0.08)	0.04 0.04 (0.04)	254314 2006/7012839 RCN R06443 METCON_150 Max. frozen storage: 3.5 month
USA, 2006, Grand Island, NE (NK N73-F7 RR/LL/YG)	4× 0.11	7	178 187 187 187	87	21	Stover	0.09 0.08 (0.09)	0.03 0.03 (0.03)	0.02 0.02 (0.02)	254314 2006/7012839 RCN R06444 METCON_150 Max. frozen storage: 3.0 month
USA, 2006, Osceola, NE (NK N73-F7)	4× 0.11	6–8	187 187 187 187	87	21	Stover	0.35 0.38 (0.37)	0.10 0.10 (0.10)	0.08 0.08 (0.08)	254314 2006/7012839 RCN R06445 METCON_150 Max. frozen

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [ab] M11	M21	M30	Report/Trial No., Reference, Storage period
										storage: 3.5 month
USA, 2006, Dill, OK (DK C48–53 AF2)	4× 0.11	6–9	196 206 196 196	87	21	Stover	0.30 0.31 (0.31)	0.07 0.09 (0.08)	0.07 0.06 (0.07)	254314 2006/7012839 RCN R06446 METCON_150 Max. frozen storage: 2.5 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

[b] Residues of metabolites M11, M21 and M30 are expressed as parent equivalent (conversion factors 0.95, 0.95 and 0.96, respectively). For calculations, 0.01 mg/kg was used for residues below or at the LOQ for metabolites M11, M21 and M30.

Table 220 Residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), and triazolyl acetic acid (TAA) in maize stover following foliar treatment (cGAP USA: 4 × 92 g ai/ha; 20 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] T	TA	TAA	Report/Trial No., Reference, Storage period
USA, 2006, Germansville, PA (TA5750)	4× 0.11	7	290 290 281 290	87	21	Stover	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06426 METCON_150 Max. frozen storage: 2.5 month
USA, 2006, Seven Springs, NC (Garst 8377)	4× 0.11	7	271 271 271 271	87	21	Stover	< 0.05 < 0.05 (< 0.05)	0.05 0.06 (0.06)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06427 METCON_150 Max. frozen storage: 3.3 month
USA, 2006, New Holland, OH (Crows 7R154)	4× 0.11	6–9	196 196 206 196	87	20	Stover	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06429 METCON_150 Max. frozen storage: 2.7 month
USA, 2006, Atlanta, OH (Crows 5151)	4× 0.11	6–9	150 150 150 150	87	20	Stover	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06430 METCON_150 Max. frozen storage: 2.2 month
USA, 2006, Carlyle, IL, (BT 6516 RR 2YG)	4× 0.11	7	131 215 224 178	R6	21	Stover	< 0.01 < 0.01 (< 0.01)	< 0.05 < 0.05 (< 0.05)	< 0.01 < 0.01 (< 0.01)	254314 2006/7012839 RCN R06431 METCON_150 Max. frozen storage: 3.0 month

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] T	TA	TAA	Report/Trial No., Reference, Storage period
USA, 2006, Mason, IL, (Burrus 664 RWR-PX4)	4× 0.11	6–8	159 140 159 159	87–89	21	Stover	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06432 METCON_150 Max. frozen storage: 3.2 month
USA, 2006, Wyoming, IL, (Burrus 644 RWR)	4× 0.11	6–7	159 159 159 150	R5	22	Stover	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06433 METCON_150 Max. frozen storage: 2.2 month
USA, 2006, Danville, IN (Wyffels W5531)	4× 0.11	7	140 140 150 159	87–89	21	Stover	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06434 METCON_150 Max. frozen storage: 3.2 month
USA, 2006, Bellmore, IN (Wyffels W5531)	4× 0.11	6–8	159 159 159 159	87	21	Stover	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06435 METCON_150 Max. frozen storage: 2.0 month
USA, 2006, Richland, IO (Golden Harvest HX 9323)	4× 0.11	7	150 150 150 178	R5	21	Stover	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06436 METCON_150 Max. frozen storage: 2.5 month
USA, 2006, Hedrick, IO (Pioneer 34A16)	4× 0.11	7–8	159 159 159 140	R5	21	Stover	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06437 METCON_150 Max. frozen storage: 3.3 month
USA, 2006, Ollie, IO (Middlekoop 2212)	4× 0.11	7	159 150 159 178	R5	21	Stover	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06438 METCON_150 Max. frozen storage: 3.0 month
USA, 2006, Bagley, IO (33P65)	4× 0.11	7	206 206 224 215	85	21	Stover	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06439 METCON_150 Max. frozen

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] T	TA	TAA	Report/Trial No., Reference, Storage period
										storage: 2.5 month
USA, 2006 Delavan, WI (DKC52–40 (RR2/YGPL))	4× 0.11	6–7	159 159 168 159	R5	21	Stover	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06440 METCON_150 Max. frozen storage: 2.3 month
USA, 2006 Ellendale, MN (Pioneer 38H66)	4× 0.11	6–7	159 150 168 159	R5/R6	21	Stover	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06441 METCON_150 Max. frozen storage: 2.3 month
USA, 2006 Geneva, MN (Pioneer 38H66)	4× 0.11	6–7	159 159 168 159	R5/R6	21	Stover	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06442 METCON_150 Max. frozen storage: 2.3 month
USA, 2006 York, NE (Pioneer 34N45 RR/YG)	4× 0.11	6–7	187 187 187 187	87	21	Stover	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06443 METCON_150 Max. frozen storage: 3.5 month
USA, 2006, Grand Island, NE (NK N73-F7 RR/LL/YG)	4× 0.11	7	178 187 187 187	87	21	Stover	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06444 METCON_150 Max. frozen storage: 3.0 month
USA, 2006, Osceola, NE (NK N73-F7)	4× 0.11	6–8	187 187 187 187	87	21	Stover	< 0.05 < 0.05 (< 0.05)	0.07 0.07 (0.07)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06445 METCON_150 Max. frozen storage: 3.5 month
USA, 2006, Dill, OK (DK C48–53 AF2)	4× 0.11	6–9	196 206 196 196	87	21	Stover	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	< 0.05 < 0.05 (< 0.05)	254314 2006/7012839 RCN R06446 METCON_150 Max. frozen storage: 2.5 month

[1] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Almond hulls

A total of seven field trials were conducted on almonds in the USA during the 2003 and 2005 growing seasons (Green, 2006, METCON_155). Plants received 2 foliar applications of metconazole at nominal rates of 304 g ai/ha. Two trial also received an exaggerated rate of 2 application at 608 g ai/ha. Additional samples from a decline trial were collected at 15, 20, 25 and 30 DALA. Samples of almond hulls were taken at 25 days after the last application. Residues of *cis*- and *trans*-metconazole were determined using method RM–41C–1 with a limit of quantification of 0.02 mg/kg. Overall mean procedural recoveries for *cis*- and *trans*-metconazole in pecans spiked from 0.02 to 4.0 mg/kg were 93 ± 8% (n = 17) and 94 ± 6% (n = 17), respectively.

Table 221 Residues of metconazole in almonds following foliar treatment (cGAP USA: 4 × 123 g ai/ha; 25 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2003, Orland, CA (TN 0660 Non-Pareil)	307 306	155	1034 1038	100% hull split	25	Hulls	0.98 1.2 (1.1)	0.22 0.25 (0.24)	1.2 1.5 (1.3)	V200600153 2006/7017431 V–25700-03-A METCON_155 Max. frozen storage: 8.0 month
	608 607	155	1031 1038	100% hull split	25	Hulls	2.1 2.0 (2.0)	0.44 0.42 (0.43)	2.5 2.4 (2.5)	
USA, 2003, Madera, CA (TN 0660 Non-Pareil)	308 306	138	1313 1307	Formed almond full	15	Hulls	0.68 0.57 (0.63)	0.14 0.12 (0.13)	0.82 0.69 (0.76)	V200600153 2006/7017431 V–25700-03-B METCON_155 Max. frozen storage: 8.9 month
					20		0.59 0.59 (0.59)	0.11 0.12 (0.12)	0.70 0.71 (0.71)	
					25		0.42 0.51 (0.47)	0.08 0.10 (0.09)	0.50 0.61 (0.56)	
					30		0.66 0.66 (0.66)	0.13 0.13 (0.13)	0.79 0.79 (0.79)	
USA, 2003, Yuba City, CA (TN 0660 Non-Pareil)	304 304	138	934 936	Hull split	25	Hulls	0.60 0.46 (0.53)	0.12 0.09 (0.11)	0.72 0.55 (0.64)	V200600153 2006/7017431 V–25700-03-C METCON_155 Max. frozen storage: 4.5 month
USA, 2003, Kerman, CA (TN 0660 Non-Pareil)	304 304	144	1209 1208	Hull split 10%	25	Hulls	1.5 2.9 1.9 3.0 1.7 2.8 (2.3)	0.32 0.60 0.44 0.65 0.39 0.60 (0.50)	1.8 3.5 2.4 3.7 2.1 3.4 (2.8)	V200600153 2006/7017431 V–25700-03-D METCON_155 Max. frozen storage: 9.4 month
USA, 2003, Terra Bella, CA (TN 0660 Non-Pareil)	308 305	136	1402 1338	Hull split	25	Hulls	0.65 0.65 (0.65)	0.12 0.13 (0.13)	0.77 0.78 (0.78)	V200600153 2006/7017431 V–25700-03-E METCON_155 Max. frozen storage: 8.8 month
USA, 2005, Glenn, CA (TN 0660 Non-Pareil)	153 305	149	1032 1309	Hull split	25	Hulls	0.35 0.30 (0.33)	0.08 0.07 (0.08)	0.43 0.37 (0.40)	V200600153 2006/7017431 V–25700-03-F METCON_155 Max. frozen
	152 304	149	1031 1310	Hull split	25	Hulls	< 0.02 < 0.02	< 0.02 < 0.02	< 0.04 < 0.04	

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
							(< 0.02)	(< 0.02)	(< 0.04)	storage: 2.5 month
USA, 2005, Kerman, CA (TN 0660 Non-Pareil)	150 299	133	1109 1102	Hull split	25	Hulls	0.61 0.62 (0.62)	0.15 0.13 (0.14)	0.76 0.75 (0.76)	V200600153 2006/7017431 V–25700-03-G
	151 299	133	1114 1106	Hull split	25	Hulls	1.3 1.7 (1.5)	0.28 0.33 (0.31)	1.6 2.0 (1.8)	METCON_155 Max. frozen storage: 3.1 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Rape seed forage

A total of seven field trials were conducted on oilseed rape in France during the 1995, 1996 and 1998 growing seasons (METCON_156 to METCON_161). Plants received 2 foliar applications of metconazole at nominal rates of 90 g ai/ha, one at first petal fall and the second 14 days later. Additional samples from decline trials were collected at -0, 0, 14, 29/39 and 39–57 DALA. Rape plants were harvested at intervals ranging between 39–70 days after the last application. Residues of *cis*- and *trans*-metconazole were determined using method FAMS 059-01 or FAMS 059-02 with a limit of quantification of 0.01 mg/kg. Overall mean procedural recoveries for *cis*- and *trans*-metconazole in oilseed rape plants were between 70–120% with an RDS of <20% for both methods and all analytes.

Table 222 Residues of metconazole in oilseed rape plants following foliar treatment (cGAP Chile: 2 × 90 g ai/ha; 42 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
France, 1996, Carniac et St. denis (Synergy)	2 × 90	14	400 400	69	-0 0 14 29 39	Plants	0.34 0.83 0.20 0.12 0.080	0.050 0.16 0.040 0.020 0.010	0.39 0.99 0.24 0.14 0.09	MK-FR–96–217 MK–750-004 96–217–297 METCON_157 Max. frozen storage: 5 months
France, 1996, Martres (Groeland)	2 × 90	14	400 400	69	-0 0 14 29 39	Plants	0.12 0.73 0.14 0.050 0.060	0.020 0.15 0.030 0.010 0.010	0.14 0.88 0.17 0.060 0.070	MK-FR–96–217 MK–750-004 96–217–298 METCON_157 Max. frozen storage: 5 months
France, 1996, Martres (Synergy)	2 × 90	14	400 400	69	-0 0 14 39 57	Plants	0.14 1.6 0.35 0.090 0.11	0.030 0.33 0.070 0.020 0.020	0.17 1.90 0.42 0.11 0.13	MK-FR–96–217 MK–750-004 96–217–299 METCON_157 Max. frozen storage: 5 months
France, 1996, Caillouet (Goeland)	2 × 90	14	364 364	69/71	-0 0 14 29 41	Plants	0.49 1.6 0.64 0.11 0.040	0.090 0.34 0.12 0.020 < 0.01	0.58 1.91 0.76 0.13 0.050	MK-FR–96–215 MK–750-006 96–215–316 METCON_159 Max. frozen storage: 6 months
France, 1996, Pacy sur eure Orgeville (Goeland)	2 × 90	14	364 364	69/71	-0 0 14 29 41	Plants	0.49 1.70 0.32 0.090 0.050	0.090 0.35 0.060 0.020 0.010	0.58 2.05 0.38 0.11 0.060	MK-FR–96–215 MK–750-006 96–215–317 METCON_159 Max. frozen storage: 6 months

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
France, 1996, Epoye (Synergy)	2 × 90 300	16	300 300	71	-0 0 15 29 40	Plants	0.39 1.0 0.34 0.13 0.11	0.080 0.22 0.070 0.030 0.020	0.47 1.24 0.41 0.16 0.13	MK-FR–96–215 MK–750-006 96–215–318 METCON_159 Max. frozen storage: 6 months
France, 1996, Pignicourt (Goeland)	2 × 90 300	16	300 300	69	-0 0 15 29 40	Plants	0.17 1.80 0.23 0.14 0.10	0.030 0.36 0.050 0.030 0.020	0.20 2.16 0.28 0.17 0.12	MK-FR–96–215 MK–750-006 96–215–319 METCON_159 Max. frozen storage: 6 months

Cotton gin by-products

A total of six field trials were conducted on cotton in Canada and the USA during the 2006 growing season (Carringer, 2007, METCON_164). Plants received 3 foliar applications of metconazole at nominal rates of 110 g ai/ha. Additionally, one trial received an exaggerated rate at 3×550 g ai/ha. Cotton gin by-products were sampled at 29–32 days after the last application. Residues of *cis*- and *trans*-metconazole and its metabolites M11, M21, M30, T, TAA and TA were determined using method D0604. The limit of quantification for the sum of cis- and trans-metconazole and metabolites M11, M21, M30 was at 0.01 mg/kg, and for metabolites T, TAA and TA at 0.01 mg/kg or 0.05 mg/kg. Procedural recoveries for all trials and analytes were within 70–120% with an RSD of < 20%.

Residues of metabolites 1,2,4-triazole, triazolyl alanine, and triazolyl acetic acid, were each below their LOQ of 0.05 mg/kg mg/kg in all trials.

Table 223 Residues of *cis*- and *trans*-metconazole in cotton gin by-products following foliar treatment (cGAP USA: 3×92 g ai/ha; 30 days PHI).

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
USA, 2006, Newport, AR (DP444 BG/RR)	3 × 110	- 6 7	94 94 94	81	30	Gin by-products	1.9 2.1 (2.0)	0.49 0.51 (0.50)	2.4 2.6 (2.5)	254317 2007/7001663 RCN R06451 METCON_164 Max. frozen storage: 5.8 months
USA, 2006, Proctor AR (DP444BR)	3 × 110	- 7 7	122 122 122	15% open bolls	30	Gin by-products	0.14 0.15 (0.14)	0.034 0.036 (0.035)	0.17 0.18 (0.18)	254317 2007/7001663 RCN R06453 METCON_164 Max. frozen storage: 6.1 months
USA, 2006, Uvalde, TX (DPL 444)	3 × 110	- 7 7	131 140 131	81	31	Gin by-products	0.15 0.16 (0.14)	0.027 0.037 (0.032)	0.14 0.20 (0.17)	254317 2007/7001663 RCN R06454 METCON_164 Max. frozen storage: 5.5 month
USA, 2006, Levelland, TX (FM9063	3 × 110	- 8	140 140	79–80	30	Gin by-products	3.0 3.8	0.70 0.86	3.7 4.6	254317 2007/7001663 RCN R06455

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] Metconazole *cis*	*trans*	Total	Report/Trial No., Reference, Storage period
B2F)		7	140				(3.4)	(0.78)	(4.1)	METCON_164 Max. frozen storage: 2.8 month
USA, 2006, Wolfforth, TX (Fiber Max 960 BG II)	3 × 110	- 6 8	140 140 140	79	30	Gin by-products	3.2 3.1 (3.2)	0.53 0.50 (0.52)	3.7 3.6 (3.7)	254317 2007/7001663 RCN R06456 METCON_164 Max. frozen storage: 4.5 month
USA, 2006, Hinton, OK (DG 2242 B2RF)	3 × 110	- 7 7	112 196 206	87	32	Gin by-products	2.1 2.5 (2.3)	0.51 0.55 (0.53)	2.6 3.0 (2.8)	254317 2007/7001663 RCN R06457 METCON_164 Max. frozen storage: 4.8 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

Table 224 Residues of metabolites M11, M21 and M30 in cotton gin by-products following foliar treatment (cGAP USA: 3×92 g ai/ha; 30 days PHI)

Location, Year (variety	Application g ai/ha	Interval (days)	L/ha	Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a] M11	M21	M30	Report/Trial No., Reference, Storage period
USA, 2006, Newport, AR (DP444 BG/RR)	3 × 110	- 6 7	94 94 94	81	30	Gin by-products	0.12 0.14 (0.13)	0.040 0.040 (0.040)	0.020 0.020 (0.020)	254317 2007/7001663 RCN R06451 METCON_164 Max. frozen storage: 5.8 months
USA, 2006, Proctor AR (DP444BR)	3 × 110	- 7 7	122 122 122	15% open bolls	30	Gin by-products	0.020 0.020 (0.020)	< 0.01 < 0.01 (< 0.01)	< 0.01 < 0.01 (< 0.01)	254317 2007/7001663 RCN R06453 METCON_164 Max. frozen storage: 6.1 months
USA, 2006, Uvalde, TX (DPL 444)	3 × 110	- 7 7	131 140 131	81	31	Gin by-products	0.010 0.020 (0.015)	0.020 0.030 (0.025)	< 0.01 < 0.01 (< 0.01)	254317 2007/7001663 RCN R06454 METCON_164 Max. frozen storage: 5.5 month
USA, 2006, Levelland, TX (FM9063 B2F)	3 × 110	- 8 7	140 140 140	79–80	30	Gin by-products	0.060 0.080 (0.070)	0.040 0.040 (0.040)	0.010 0.010 (0.010)	254317 2007/7001663 RCN R06455 METCON_164 Max. frozen storage: 2.8 month
USA, 2006, Wolfforth, TX (Fiber Max 960 BG II)	3 × 110	- 6 8	140 140 140	79	30	Gin by-products	0.060 0.070 (0.065)	0.040 0.040 (0.040)	0.01 0.01 (0.010)	254317 2007/7001663 RCN R06456 METCON_164

Location, Year (variety	Application			Growth stage at final appl.	DALA	Sample	Residues found [mg/kg] [a]			Report/Trial No., Reference, Storage period
	g ai/ha	Interval (days)	L/ha				M11	M21	M30	Max. frozen storage: 4.5 month
USA, 2006, Hinton, OK (DG 2242 B2RF)	3 × 110	- 7 7	112 196 206	87	32	Gin by-products	0.11 0.13 (0.12)	0.030 0.030 (0.030)	0.020 0.020 (0.020)	254317 2007/7001663 RCN R06457 METCON_164 Max. frozen storage: 4.8 month

[a] Results from 2 replicate field samples are presented and values in parentheses represent mean values

FATE OF RESIDUES IN STORAGE AND PROCESSING

Nature of residue during processing

Cis-isomer specific radiolabelled [triazole–^{14}C]-metconazole was incubated in aqueous acetate buffer solutions at concentrations of about 0.36 mg/L under three sets of conditions, each designed to simulate an appropriate process: 90 °C (pH 4, 20 minutes) to simulate pasteurisation, 100 °C (pH 5, 60 minutes), to simulate boiling, baking and brewing, and 120 °C (pH 6, 20 minutes) to simulate sterilisation (Adam, 2013, METCON_166).

Total recovered radioactivity was measured for each test solution by LSC. Radioactive components were characterised by fractionation and co-chromatography with authenticated reference compounds using HPLC-UV. Selected samples were also analysed by TLC as confirmatory method.

Table 225 Hydrolysis of *cis*-metconazole under simulated processing conditions.

Compound	% applied radioactivity recovered as		
	Total	*cis*-metconazole	*trans*-metconazole
pH 4 90°C 20 mins			
Before test	100	98	1.6
After test	95	94	1.1
pH 5 100°C 60 mins			
Before test	100	98	1.7
After test	97	96	1.5
pH 6 120°C 20 mins			
Before test	100	98	1.6
After test	97	96	1.6

Residues after processing

The fate of metconazole during processing of raw agricultural commodity (RAC) was investigated in plums, soya bean, potato, sugar beet, barley, oat, maize, wheat, sugar cane, oilseed rape seed, cotton seed and peanut. As a measure of the transfer of residues into processed products, a processing factor was used, which is defined as:

Processing factor = Residue in processed product (mg/kg) ÷ Residue in raw agricultural commodity (mg/kg)

If residues in the RAC were below the LOQ, no processing factor could be derived. In case of residues below the LOQ in the processed product, the numeric value of the LOQ was used for the calculation and the PF was expressed as “less than” (e.g. < 0.5).

Plum

The transfer of residues of metconazole into processed commodities was investigated in plums from one supervised field trial conducted in the USA (Green, 2006, METCON_106). The trial was performed with an exaggerated rate of 3×750 g ai/ha with an interval of 7 and 119 days and harvest at 14 DALA. Plums were oven dried using common commercial practices. All samples were analysed according to method RM–41C–1. Overall mean procedural recoveries for *cis*- and *trans*-metconazole in plums spiked at 0.02–1.0 mg/kg were 94% (n = 4) and 96% (n = 4), respectively.

Table 226 Summary of metconazole residues in dried plums.

Trial Identification (City, State/Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	Sum of *cis*- and *trans*-metconazole (mg/kg) [a]	Processing Factor
2006/1052075 V–25671-04-F (Kerman, CA, USA, 2004)	Plum/ French Prune	Plum (RAC)	2250	14	0.13	-
		Dried plum			0.29	2.3

RAC: raw agricultural commodity

[a] Mean of two replicate field samples

Soya bean

The transfer of residues of metconazole into processed commodities was investigated in soya beans from four supervised field trial conducted in the USA (White & Saha, 2006, METCON_167). The trials were performed at an exaggerated rate of 2×392–403 g ai/ha (5×) with an interval of 8–11 days and harvest at 27–31 DALA. Soya beans were processed to meal, hulls, crude oil and refined oil using common commercial practices (drying of the bean, separation into hulls and kernels, hot hexane extraction, removal of hexane by heat, alkalin refinement). All samples were analysed for residues of *cis*- and *trans*-metconazole and its metabolites M11, M21, M30, T, TAA and TA using method D0508. Procedural recoveries for all trials and analytes were within 70–120%. Samples of the RAC and processed commodities were stored frozen up to 2.8 month.

Residues of metabolites M11, M21 and M30, were each below their LOQ of 0.01 mg/kg in soya bean RAC and processed commodities.

Table 227 Summary of the sum of *cis*- and *trans*-metconazole residues in soya bean processed commodities.

Trial Identification (City, State/Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	Sum of *cis*- and *trans*-metconazole (mg/kg)	Processing Factor
R05188 (Pepin, WI, USA, 2005)	Soya bean/ Asgrow AG1603	Seed RAC	790	31	< 0.01	-
		Hulls			0.022	N/A
		Meal			< 0.01	N/A
		Crude oil			< 0.01	N/A
		Refined oil			< 0.01	N/A
R05189 (York, NW, USA, 2005)	Soya bean / Asgrow 2703 RR	Seed RAC	790	31	0.021	-
		Hulls			0.018	0.86
		Meal			0.010	0.48
		Crude oil			0.016	0.76
		Refined oil			< 0.01	< 0.48
R05190 (Cass, ND, USA, 2005)	Soya bean / 0491731 (Mycogen)	Seed RAC	780	27	0.019	-
		Hulls			0.049	2.6
		Meal			< 0.01	< 0.53
		Crude oil			0.016	0.84
		Refined oil			< 0.01	< 0.53
R05191 (Clinton, IL, USA, 2005)	Soya bean / NK 43 B1	Seed RAC	780	29	0.016	-
		Hulls			0.020	1.3
		Meal			0.011	0.69

Trial Identification (City, State/Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	Sum of *cis*- and *trans*-metconazole (mg/kg)	Processing Factor
		Crude oil			0.016	1.0
		Refined oil			0.011	0.69

RAC: raw agricultural commodity

Table 228 Summary of residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), and triazolyl acetic acid (TAA) in soya bean processed commodities.

Trial Identification (City, State/ Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	T		TA		TAA	
					mg/kg	PF	mg/kg	PF	mg/kg	PF
R05188 (Pepin, WI, USA, 2005)	Soya bean/ Asgrow AG1603	Seed RAC	790	31	< 0.05	-	< 0.05	-	< 0.05	-
		Hulls			< 0.05	N/A	0.15	N/A	< 0.05	N/A
		Meal			< 0.05	N/A	0.05	N/A	< 0.05	N/A
		Crude oil			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Refined oil			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
R05189 (York, NW, USA, 2005)	Soya bean / Asgrow 2703 RR	Seed RAC	790	31	< 0.05	-	0.12 Control: 0.06	-	< 0.05	-
		Hulls			< 0.05	N/A	< 0.05 Control: 0.07	< 0.4	< 0.05	N/A
		Meal			< 0.05	N/A	0.21 Control. 0.11	1.8	< 0.05	N/A
		Crude oil			< 0.05	N/A	< 0.05	< 0.4	< 0.05	N/A
		Refined oil			< 0.05	N/A	< 0.05	< 0.4	< 0.05	N/A
R05190 (Cass, ND, USA, 2005)	Soya bean / 0491731 (Mycogen)	Seed RAC	780	27	< 0.05	-	0.10	-	< 0.05	-
		Hulls			< 0.05	N/A	0.13	1.3	< 0.05	N/A
		Meal			< 0.05	N/A	0.12	1.2	< 0.05	N/A
		Crude oil			< 0.05	N/A	< 0.05	< 0.5	< 0.05	N/A
		Refined oil			< 0.05	N/A	< 0.05	< 0.5	< 0.05	N/A
R05191 (Clinton, IL, USA, 2005)	Soya bean / NK 43 B1	Seed RAC	780	29	< 0.05	-	0.16	-	< 0.05	-
		Hulls			< 0.05	N/A	0.08	0.5	< 0.05	N/A
		Meal			< 0.05	N/A	0.17	1.1	< 0.05	N/A
		Crude oil			< 0.05	N/A	< 0.05	< 0.3	< 0.05	N/A
		Refined oil			< 0.05	N/A	< 0.05	< 0.3	< 0.05	N/A

RAC: raw agricultural commodity

Potato

The transfer of residues of metconazole into processed commodities was investigated in potato from two supervised field trial conducted in the USA (Corley, 2010, METCON_146). The trials were performed with 4 or 5 applications using an exaggerated rate of 700 g ai/ha with an interval of 5–7 days and harvest at 1 DALA. Potatoes were processed to potato flakes/granules, potato chips, and wet peel using common commercial practices. All samples were analysed according to method RM–41C–1 for the determination of *cis*- and *trans*-metconazole and according to method Meth–160 for the determination of triazole metabolites. Overall mean procedural recoveries for all metabolites spiked at 0.02–2.0 mg/kg were within 70–120% with an RSD of < 20%.

Since no residues of metconazole or its triazole metabolites were detected in the RAC at levels >LOQ, processed commodities were not further analysed.

Sugar beet

The transfer of residues of metconazole into processed commodities was investigated in sugar beet from four supervised field trial conducted in the USA (Jordan & Saha, 2006, METCON_168). The trials were performed at an exaggerated rate of 2×549–571 g ai/ha (5×) with an interval of 13–15 days and harvest at 14–15 DALA. Sugar beets were processed to extracted pulp, dried pulp, pressed water, raw juice, lime sludge (mud), thin juice, thick juice, molasses, raw sugar and refined sugar using common commercial practices. All samples were analysed for residues of *cis*- and *trans*-metconazole and its metabolites M11, M21, M30, T, TAA and TA using method D0508. Procedural recoveries for all trials and analytes were mostly within 70–120%, but never below 63% (M30 in raw sugar). Samples of the RAC and processed commodities were stored frozen up to 1.4 months.

Residues of metabolites M11, M21 and M30, were each below their LOQ of 0.01 mg/kg in sugar beet RAC and processed commodities.

Table 229 Summary of the sum of *cis*- and *trans*-metconazole residues in sugar beet processed commodities.

Trial Identification (City, State/Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	Total Residues (mg/kg)	Processing Factor
R05097 (Pepin, WI, USA, 2005)	Sugar beet/ VDH66556 8232 Medium	Roots (RAC)	1110	14	0.018	-
		Pulp (ext.)			0.013	0.7
		Dried pulp			0.078	4.4
		Water			< 0.01	< 0.6
		Raw juice			< 0.01	< 0.6
		Lime sludge			< 0.01	< 0.6
		Thin juice			< 0.01	< 0.6
		Thick juice			< 0.01	< 0.6
		Molasses			0.019	1.0
		Raw sugar			0.017	0.9
		Ref. sugar			< 0.01	< 0.6
R05098 (Brown, SD, USA, 2005)	Sugar beet/ VanDer Have HH811	Roots (RAC)	1120	14	< 0.01	-
		Pulp (ext.)			< 0.01	N/A
		Dried pulp			0.014	N/A
		Water			< 0.01	N/A
		Raw juice			< 0.01	N/A
		Lime sludge			< 0.01	N/A
		Thin juice			< 0.01	N/A
		Thick juice			< 0.01	N/A
		Molasses			0.015	N/A
		Raw sugar			< 0.01	N/A
		Ref. sugar			< 0.01	N/A
R05099 (Fresno, CA, USA, 2005)	Sugar beet/ SSNB 7 R	Roots (RAC)	1130	14	0.022	-
		Pulp (ext.)			0.085	3.9
		Dried pulp			0.91	41.3
		Water			0.030	1.4
		Raw juice			0.032	1.5
		Lime sludge			0.018	0.8
		Thin juice			0.045	2.1
		Thick juice			0.054	2.5
		Molasses			0.083	3.9
		Raw sugar			0.094	4.4
		Ref. sugar			0.027	1.2
R05100 (Payette, ID, USA, 2005)	Sugar beet/ HM WS91	Roots (RAC)	1120	15	0.023	-
		Pulp (ext.)			0.023	1.0
		Dried pulp			0.21	9.2
		Water			< 0.01	< 0.4
		Raw juice			0.011	0.5
		Lime sludge			0.011	0.5
		Thin juice			< 0.01	< 0.4
		Thick juice			0.018	0.8

Trial Identification (City, State/Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	Total Residues (mg/kg)	Processing Factor
		Molasses			0.030	1.3
		Raw sugar			0.027	1.2
		Ref. sugar			0.012	0.5

RAC: raw agricultural commodity

Table 230 Summary of residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), and triazolyl acetic acid (TAA) in soya bean processed commodities.

Trial Identification (City, State/ Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	T		TA		TAA	
					mg/kg	PF	mg/kg	PF	mg/kg	PF
R05097 (Pepin, WI, USA, 2005)	Sugar beet/ VDH66556 8232 Medium	Roots (RAC)	1110	14	< 0.05	-	< 0.05	-	< 0.05	-
		Pulp (ext.)			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Dried pulp			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Water			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Raw juice			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Lime sludge			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Thin juice			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Thick juice			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Molasses			< 0.05	N/A	0.06	N/A	< 0.05	N/A
		Raw sugar			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Ref. sugar			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
R05098 (Brown, SD, USA, 2005)	Sugar beet/ VanDer Have HH811	Roots (RAC)	1120	14	< 0.05	-	< 0.05	-	< 0.05	-
		Pulp (ext.)			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Dried pulp			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Water			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Raw juice			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Lime sludge			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Thin juice			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Thick juice			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Molasses			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Raw sugar			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Ref. sugar			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
R05099 (Fresno, CA, USA, 2005)	Sugar beet/ SSNB 7 R	Roots (RAC)	1130	14	< 0.05	-	< 0.05	-	< 0.05	-
		Pulp (ext.)			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Dried pulp			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Water			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Raw juice			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Lime sludge			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Thin juice			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Thick juice			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Molasses			< 0.05	N/A	0.17	N/A	< 0.05	N/A
		Raw sugar			< 0.05	N/A	0.14	N/A	< 0.05	N/A
		Ref. sugar			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
R05100 (Payette, ID, USA, 2005)	Sugar beet/ HM WS91	Roots (RAC)	1120	15	< 0.05	-	< 0.05	-	< 0.05	-
		Pulp (ext.)			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Dried pulp			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Water			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Raw juice			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Lime sludge			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Thin juice			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Thick juice			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A
		Molasses			< 0.05	N/A	0.11	N/A	< 0.05	N/A
		Raw sugar			< 0.05	N/A	0.09	N/A	< 0.05	N/A
		Ref. sugar			< 0.05	N/A	< 0.05	N/A	< 0.05	N/A

RAC: raw agricultural commodity

Barley

The transfer of residues of metconazole into processed commodities was investigated in barley from four supervised field trial conducted in Germany (Plier, 2015, METCON_169). The trials were performed at an exaggerated rate of 2 × 270 g ai/ha (2×) with an interval of 17–23 days and harvest at 44–59 DALA. Barley was processed into pot barley, flour, bran, brewing malt, malt sprouts, beer, brewer's grain (dried) and brewer's yeast using common commercial practices. All samples were analysed for residues of *cis*- and *trans*-metconazole and its metabolites 1,2,4-triazole (T), triazolyl alanine (TA), triazolyl acetic acid (TAA) and triazole lactic acid (TLA) using method L0019/01. Overall mean procedural recoveries for all commodities and analytes were within 70–120% with an RSD of < 20%.

Table 231 Summary of the sum of *cis*- and *trans*-metconazole residues in barley processed commodities.

Trial Identification (City, State/Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	Total Residues (mg/kg)	Processing Factor
L120187 (Motterwitz, Germany, 2012)	Barley/ Marthe	Grain (RAC)	540	44	0.078	-
		Pot barley			0.037	0.47
		Flour			0.12	1.54
		Bran			0.20	2.56
		Brewing malt			0.049	0.63
		Malt sprouts			0.046	0.59
		Beer			< 0.01	< 0.13
		Brewer's grain (dried)			0.17	2.18
		Brewer's yeast			0.029	0.37
L120188 (Trossin, Germany, 2012)	Barley/ Tocada	Grain (RAC)	540	50	0.14	-
		Pot barley			0.072	0.51
		Flour			0.32	2.29
		Bran			0.38	2.71
		Brewing malt			0.083	0.59
		Malt sprouts			0.051	0.36
		Beer			< 0.01	< 0.07
		Brewer's grain (dried)			0.27	1.93
		Brewer's yeast			0.027	0.19
L120189 (Neubukow, Germany, 2012)	Barley/ Quench	Grain (RAC)	540	55	0.024	-
		Pot barley			0.013	0.54
		Flour			0.068	2.83
		Bran			0.097	4.04
		Brewing malt			0.016	0.67
		Malt sprouts			0.017	0.71
		Beer			< 0.01	< 0.42
		Brewer's grain (dried)			0.052	2.17
		Brewer's yeast			0.013	0.54
L120190 (Donnersdorf, Germany, 2012)	Barley/ Margret	Grain (RAC)	540	59	4.5	-
		Pot barley			0.39	0.09
		Flour			13	2.89
		Bran			22	4.89
		Brewing malt			0.70	0.16
		Malt sprouts			0.86	0.19
		Beer			< 0.01	< 0.002
		Brewer's grain (dried)			1.7	0.38
		Brewer's yeast			0.21	0.05

RAC: raw agricultural commodity

Table 232 Summary of residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), triazolyl acetic acid (TAA) and triazole lactic acid (TLA) in barley processed commodities.

Trial Identification (City, State/ Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	T		TA		TAA		TLA	
					mg/kg	PF	mg/kg	mg/kg	mg/kg	PF	mg/kg	PF
L120187 (Motterwitz, Germany, 2012)	Barley/ Marthe	Grain (RAC)	540	44	< 0.01	-	0.17	-	0.14	-	< 0.01	-
		Pot barley			< 0.01	N/A	0.14	0.82	0.11	0.79	< 0.01	N/A
		Flour			< 0.01	N/A	0.66	3.88	0.42	3.00	0.022	N/A
		Bran			< 0.01	N/A	0.27	1.59	0.30	2.14	0.029	N/A
		Brewing malt			< 0.01	N/A	0.22	1.29	0.16	1.14	< 0.01	N/A
		Malt sprouts			< 0.01	N/A	2.1	12	1.4	10	0.14	N/A
		Beer			< 0.01	N/A	0.057	0.34	0.030	0.21	< 0.01	N/A
		Brewer's grain (dried)			< 0.01	N/A	0.021	0.12	0.012	0.09	< 0.01	N/A
		Brewer's yeast			< 0.01	N/A	0.062	0.36	0.023	0.16	< 0.01	N/A
L120188 (Trossin, Germany, 2012)	Barley/ Tocada	Grain (RAC)	540	50	< 0.01	-	0.49	-	0.29	-	0.012	-
		Pot barley			< 0.01	N/A	0.54	1.10	0.23	0.79	< 0.01	< 0.83
		Flour			< 0.01	N/A	1.7	3.47	0.84	2.90	0.037	3.08
		Bran			< 0.01	N/A	0.65	1.33	0.65	2.24	0.042	3.50
		Brewing malt			< 0.01	N/A	0.66	1.35	0.32	1.10	0.028	<2.33
		Malt sprouts			< 0.01	N/A	5.3	11	2.5	8.62	0.34	28
		Beer			< 0.01	N/A	0.17	0.35	0.067	0.23	< 0.01	< 0.83
		Brewer's grain (dried)			< 0.01	N/A	0.070	0.14	0.030	0.10	< 0.01	< 0.83
		Brewer's yeast			< 0.01	N/A	0.16	0.33	0.051	0.18	< 0.01	< 0.83
L120189 (Neubukow, Germany, 2012)	Barley/ Quench	Grain (RAC)	540	55	< 0.01	-	0.090	-	0.069	-	< 0.01	-
		Pot barley			< 0.01	N/A	0.082	0.91	0.060	0.87	< 0.01	N/A
		Flour			< 0.01	N/A	0.45	5.00	0.30	4.35	0.010	N/A
		Bran			< 0.01	N/A	0.24	2.67	0.20	2.90	< 0.01	N/A
		Brewing malt			< 0.01	N/A	0.088	0.98	0.073	1.06	< 0.01	N/A
		Malt sprouts			< 0.01	N/A	0.80	8.89	0.54	7.83	0.043	N/A
		Beer			< 0.01	N/A	0.027	0.30	0.017	0.25	< 0.01	N/A
		Brewer's grain (dried)			< 0.01	N/A	< 0.01	< 0.11	< 0.01	< 0.14	< 0.01	N/A
		Brewer's yeast			< 0.01	N/A	0.033	0.37	0.013	0.19	< 0.01	N/A
L120190 (Donnersdorf, Germany, 2012)	Barley/ Margret	Grain (RAC)	540	59	< 0.01	-	0.41	-	0.19	-	< 0.01	-
		Pot barley			< 0.01	N/A	0.42	1.02	0.16	0.84	< 0.01	N/A
		Flour			< 0.01	N/A	1.2	2.93	0.55	2.89	0.027	N/A
		Bran			< 0.01	N/A	0.64	1.56	0.43	2.26	0.038	N/A
		Brewing malt			< 0.01	N/A	0.43	1.05	0.20	1.05	0.018	N/A
		Malt sprouts			< 0.01	N/A	3.2	7.80	1.3	6.84	0.18	N/A
		Beer			< 0.01	N/A	0.11	0.27	0.045	0.24	< 0.01	N/A

Trial Identification (City, State/ Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	T		TA		TAA		TLA	
					mg/kg	PF	mg/kg	mg/kg	mg/kg	PF	mg/kg	PF
		Brewer's grain (dried)			< 0.01	N/A	0.049	0.12	0.023	0.12	< 0.01	N/A
		Brewer's yeast			< 0.01	N/A	0.11	0.27	0.037	0.19	< 0.01	N/A

RAC: raw agricultural commodity

Oat

The transfer of residues of metconazole into processed commodities was investigated in oat from four supervised field trial conducted in Germany (Plier, 2015, METCON_170). The trials were performed at an exaggerated rate of 2 × 270 g ai/ha (2×) with an interval of 20–26 days and harvest at 43–50 DALA. Oat was processed into flour, groats/rolled oats, husks, dust and bran using common commercial practices. All samples were analysed for residues of *cis*- and *trans*-metconazole and its metabolites 1,2,4-triazole (T), triazolyl alanine (TA), triazolyl acetic acid (TAA) and triazole lactic acid (TLA) using method L0019/01. Overall mean procedural recoveries for all commodities and analytes were within 70–120% with an RSD of < 20%.

Table 233 Summary of the sum of *cis*- and *trans*-metconazole residues in oat processed commodities.

Trial Identification (City, State/Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	Total Residues (mg/kg)	Processing Factor
L120183 (Motterwitz, Germany, 2012)	Oat/ Flocke	Grain (RAC)	540	50	0.14	-
		Flour			0.019	0.14
		Groats/rolled oats			0.010	0.07
		Husks			0.31	2.2
		Dust			0.23	1.6
		Bran			0.022	0.16
L120184 (Breitenborn, Germany, 2012)	Oat/ Flocke	Grain (RAC)	540	48	0.063	-
		Flour			0.014	0.22
		Groats/rolled oats			0.011	0.17
		Husks			0.28	4.4
		Dust			0.29	4.6
		Bran			0.027	0.43
L120185 (Tuetzpatz, Germany, 2012)	Oat/ Flocke	Grain (RAC)	540	43	0.11	-
		Flour			0.022	0.20
		Groats/rolled oats			0.013	0.12
		Husks			0.44	4.0
		Dust			0.41	3.7
		Bran			0.055	0.50
L120186 (Goeppersdorf, Germany, 2012)	Oat/ Flocke	Grain (RAC)	540	48	0.067	-
		Flour			0.011	0.16
		Groats/rolled oats			< 0.01	< 0.15
		Husks			0.14	2.1
		Dust			0.27	4.0
		Bran			0.021	0.31

RAC: raw agricultural commodity

Table 234 Summary of residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), triazolyl acetic acid (TAA) and triazole lactic acid (TLA) in oat processed commodities.

Trial Identification (City, State/ Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	T		TA		TAA		TLA	
					mg/kg	PF	mg/kg	PF	mg/kg	PF	mg/kg	PF
L120183 (Motterwitz, Germany, 2012)	Oat/ Flocke	Grain (RAC)	540	50	< 0.01	-	0.26	-	0.093	-	< 0.01	-
		Flour			< 0.01	N/A	0.34	1.31	0.093	1.00	< 0.01	N/A
		Groats/rolled oats			< 0.01	N/A	0.36	1.38	0.090	0.97	< 0.01	N/A
		Husks			< 0.01	N/A	0.025	0.10	0.042	0.45	< 0.01	N/A
		Dust			< 0.01	N/A	0.41	1.58	0.11	1.18	0.014	N/A
		Bran			< 0.01	N/A	0.46	1.77	0.12	1.29	< 0.01	N/A
L120184 (Breitenborn, Germany, 2012)	Oat/ Flocke	Grain (RAC)	540	48	0.010	-	0.64	-	0.18	-	< 0.01	-
		Flour			0.014	1.40	0.61	0.95	0.17	0.94	< 0.01	N/A
		Groats/rolled oats			0.017	1.70	0.67	1.05	0.22	1.22	< 0.01	N/A
		Husks			< 0.01	1.00	0.040	0.06	0.081	0.45	< 0.01	N/A
		Dust			0.014	1.40	0.67	1.05	0.22	1.22	0.019	N/A
		Bran			0.019	1.90	0.98	1.53	0.29	1.61	< 0.01	N/A
L120185 (Tuetzpatz, Germany, 2012)	Oat/ Flocke	Grain (RAC)	540	43	< 0.01	-	0.56	-	0.15	-	< 0.01	-
		Flour			0.010	N/A	0.64	1.14	0.16	1.07	< 0.01	N/A
		Groats/rolled oats			0.012	N/A	0.70	1.25	0.17	1.13	< 0.01	N/A
		Husks			< 0.01	N/A	0.028	0.05	0.058	0.39	< 0.01	N/A
		Dust			0.013	N/A	0.77	1.38	0.21	1.40	0.021	N/A
		Bran			0.014	N/A	1.0	1.79	0.25	1.67	0.011	N/A
L120186 (Goeppersdorf, Germany, 2012)	Oat/ Flocke	Grain (RAC)	540	48	< 0.01	-	0.66	-	0.20	-	< 0.01	-
		Flour			< 0.01	N/A	0.68	1.03	0.17	0.85	< 0.01	N/A
		Groats/rolled oats			0.011	N/A	0.73	1.11	0.22	1.10	< 0.01	N/A
		Husks			< 0.01	N/A	0.024	0.04	0.086	0.43	0.015	N/A
		Dust			0.012	N/A	0.71	1.08	0.23	1.15	0.031	N/A
		Bran			0.012	N/A	1.1	1.67	0.33	1.65	< 0.01	N/A

RAC: raw agricultural commodity

Maize

The transfer of residues of metconazole into processed commodities was investigated in maize from one supervised field trial conducted in the USA (Carringer, 2007, METCON_150). The trial was performed with 4 applications using an exaggerated rate of 560 g ai/ha with an interval of 6–7 days and harvest at 21 DALA. Maize was processed to grits, meal, flour, starch and refined oil (dry and wet milling) using common commercial practices. All samples were analysed for residues of *cis*- and *trans*-metconazole and its metabolites M11, M21, M30, T, TAA and TA using method D0604. Procedural recoveries for all trials and analytes were within 70–120%. Samples of the RAC and processed commodities were stored frozen up to 1.8 months.

Residues of metabolites M11, M21, M30, 1,2,4-triazole, triazolyl alanine and triazolyl acetic acid were each below their LOQ of 0.01 or 0.05 mg/kg in maize RAC and processed commodities.

Table 235 Summary of the sum of *cis*- and *trans*-metconazole residues in maize processed commodities.

Trial Identification (City, State/Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	Total Residues (mg/kg)	Processing Factor
RCN R 06431 (Carlyle, IL, USA,	Maize/ BT 6516	Grain (RAC)	2240	21	< 0.01	-
		Grits			< 0.01	N/A

Trial Identification (City, State/Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	Total Residues (mg/kg)	Processing Factor
2006)	RR 2YG	Meal			< 0.01	N/A
		Flour			< 0.01	N/A
		Refined oil (dry milling)			< 0.01	N/A
		Starch			< 0.01	N/A
		Refined oil (wet milling)			0.011	N/A

Wheat

The transfer of residues of metconazole into processed commodities was investigated in wheat from four supervised field trial conducted in the USA (White & Saha, 2006, METCON_171). The trials were performed at an exaggerated rate of 2×560 g ai/ha (5×) with an interval of 6–7 days and harvest at 20–22 DALA. Wheat grains were processed to cleaned grain, aspirated grain fraction, epidermis/husk, coarse bran, straight flour, fine bran, middlings, shorts, germ, low grade meal, white flour, whole meal flour and bread using common commercial practices. All samples were analysed for residues of *cis*- and *trans*-metconazole and its metabolites M11, M21, M30, T, TAA and TA using method D0508. Procedural recoveries for all trials and analytes were within 70–120%. Samples of the RAC and processed commodities were stored frozen up to 2.6 months.

Table 236 Summary of the sum of *cis*- and *trans*-metconazole residues in wheat processed commodities.

Trial Identification (City, State/Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	Total Residues (mg/kg)	Processing Factor
RCN R05184 (Pepin, WI, USA, 2005)	Wheat/ Ingot	Grain (RAC)	1120	21	0.40	-
		Agf			25.7	64
		Cleaned grain			0.37	0.94
		Epidermis/husk			12	29
		Coarse bran			0.81	2.0
		Straight flour			0.057	0.14
		Fine bran			0.87	2.2
		Middlings			0.32	0.81
		Shorts			0.89	2.2
		Germ			0.37	0.92
		Low grade meal			0.26	0.66
		White flour			0.071	0.18
		Whole meal flour			0.36	0.91
		Bread			0.25	0.63
RCN R05185 (Clinton, IL, USA, 2004)	Wheat/ Excel 201	Grain (RAC)	1120	20	0.41	-
		Cleaned grain			0.46	1.1
		Epidermis/husk			23	56
		Coarse bran			0.65	1.6
		Straight flour			0.056	0.14
		Fine bran			0.66	1.6
		Middlings			0.47	1.1
		Shorts			0.98	2.4
		Germ			0.26	0.64
		Low grade meal			0.32	0.78
		White flour			0.087	0.21
		Whole meal flour			0.25	0.60
		Bread			0.18	0.44
RCN R05186 (Cass, ND, USA, 2005)	Wheat/ Knudson	Grain (RAC)	1120	22	0.24	-
		Cleaned grain			0.21	0.89
		Epidermis/husk			83	347
		Coarse bran			0.43	1.8

Trial Identification (City, State/Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	Total Residues (mg/kg)	Processing Factor
		Straight flour			0.074	0.31
		Fine bran			0.51	2.1
		Middlings			1.2	5.1
		Shorts			0.53	2.2
		Germ			0.29	1.2
		Low grade meal			0.19	0.81
		White flour			0.10	0.42
		Whole meal flour			0.21	0.88
		Bread			0.17	0.70
RCN R05187 (York, NE, USA, 2004)	Wheat/ Millenium HRW	Grain (RAC)	1120	20	0.37	-
		Cleaned grain			0.33	0.90
		Epidermis/husk			19	53
		Coarse bran			0.76	2.1
		Straight flour			0.086	0.23
		Fine bran			0.65	1.8
		Middlings			0.36	0.98
		Shorts			0.54	1.5
		Germ			0.39	1.1
		Low grade meal			0.21	0.56
		White flour			0.089	0.24
		Whole meal flour			0.14	0.39
		Bread			0.21	0.58

RAC: raw agricultural commodity

Table 237 Summary of residues of metabolites M11, M21 and M30 in wheat processed commodities

Trial Identification (City, State/ Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	M11		M21		M30	
					mg/kg	PF	mg/kg	PF	mg/kg	PF
RCN R05184 (Pepin, WI, USA, 2005)	Wheat/ Ingot	Grain (RAC)	1120	21	0.10	-	0.01	-	0.03	-
		Agf			7.15	71.5	1.71	171	1.44	48
		Cleaned grain			0.10	1.0	0.02	2.0	0.03	1
		Epidermis/husk			3.9	39	0.82	82	0.77	26
		Coarse bran			0.23	2.3	0.03	3.0	0.07	2.3
		Straight flour			0.01	0.10	< 0.01	<1.0	< 0.01	< 0.33
		Fine bran			0.23	2.3	0.03	3.0	0.08	2.7
		Middlings			0.08	0.80	0.01	1.0	0.02	0.67
		Shorts			0.12	1.2	0.02	2.0	0.04	1.3
		Germ			0.10	1.0	0.02	2.0	0.03	1.0
		Low grade meal			0.10	1.0	< 0.01	<1.0	0.02	0.67
		White flour			0.02	0.20	< 0.01	<1.0	< 0.01	< 0.33
		Whole meal flour			0.09	0.90	0.01	1.0	0.03	1.0
		Bread			0.06	0.60	0.01	1.0	0.02	0.67
RCN R05185 (Clinton, IL, USA, 2004)	Wheat/ Excel 201	Grain (RAC)	1120	20	0.04	-	0.01	-	0.01	-
		Cleaned grain			0.08	2.0	0.02	2.0	0.02	2.0
		Epidermis/husk			1.2	31	0.56	56	0.21	21
		Coarse bran			0.09	2.3	0.02	2.0	0.02	2.0
		Straight flour			< 0.01	< 0.25	< 0.01	<1.0	< 0.01	<1.0
		Fine bran			0.11	2.75	0.03	3.0	0.03	3.0
		Middlings			0.03	0.75	0.01	1.0	< 0.01	<1.0
		Shorts			0.06	1.5	0.02	2.0	0.01	1.0
		Germ			0.03	0.75	< 0.01	<1.0	< 0.01	<1.0
		Low grade meal			0.04	1.0	0.01	1.0	0.01	1.0
		White flour			< 0.01	< 0.25	< 0.01	<1.0	< 0.01	<1.0
		Whole meal flour			0.04	1.0	0.01	1.0	< 0.01	<1.0
		Bread			0.02	0.50	< 0.01	<1.0	< 0.01	<1.0

Trial Identification (City, State/ Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	M11		M21		M30	
					mg/kg	PF	mg/kg	PF	mg/kg	PF
RCN R05186 (Cass, ND, USA, 2005)	Wheat/ Knudson	Grain (RAC)	1120	22	0.09	-	0.01	-	0.03	-
		Cleaned grain			0.07	0.78	0.01	1.0	0.02	0.67
		Epidermis/husk			9.2	103	2.2	220	1.2	39
		Coarse bran			0.20	2.2	0.03	3.0	0.07	2.3
		Straight flour			0.01	0.11	< 0.01	<1.0	< 0.01	< 0.33
		Fine bran			0.18	2.0	0.03	3.0	0.06	2.0
		Middlings			0.15	1.7	0.04	4.0	0.02	0.67
		Shorts			0.07	0.78	0.02	2.0	0.02	0.67
		Germ			0.05	0.56	0.02	2.0	0.01	0.33
		Low grade meal			0.04	0.44	< 0.01	<1.0	0.01	0.33
		White flour			0.03	0.33	< 0.01	<1.0	< 0.01	< 0.33
		Whole meal flour			0.07	0.78	0.01	1.0	0.02	0.67
		Bread			0.04	0.44	< 0.01	<1.0	0.01	0.33
RCN R05187 (York, NE, USA, 2004)	Wheat/ Millenium HRW	Grain (RAC)	1120	20	0.06	-	0.01	-	0.02	-
		Cleaned grain			0.06	1.0	< 0.01	<1.0	0.02	1.0
		Epidermis/husk			1.4	23	0.65	65	0.21	10.5
		Coarse bran			0.18	3.0	0.03	3.0	0.04	2.0
		Straight flour			< 0.01	< 0.17	< 0.01	<1.0	< 0.01	< 0.50
		Fine bran			0.18	3.0	0.03	3.0	0.04	2.0
		Middlings			0.04	0.67	0.02	2.0	0.01	0.5
		Shorts			0.06	1.0	0.01	1.0	0.02	1.0
		Germ			0.06	1.0	0.01	1.0	0.02	1.0
		Low grade meal			0.03	0.5	< 0.01	<1.0	< 0.01	< 0.50
		White flour			0.01	0.17	< 0.01	<1.0	< 0.01	< 0.50
		Whole meal flour			0.06	1.0	0.01	1.0	0.02	1.0
		Bread			0.04	0.67	< 0.01	<1.0	< 0.01	< 0.50

Table 238 Summary of residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA) and triazolyl acetic acid (TAA) in wheat processed commodities.

Trial Identification (City, State/ Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	T		TA		TAA	
					mg/kg	PF	mg/kg	PF	mg/kg	PF
RCN R05184 (Pepin, WI, USA, 2005)	Wheat/ Ingot	Grain RAC	1120	21	< 0.05	-	0.08	-	0.05	-
		Agf			< 0.05	N/A	< 0.05	< 0.6	0.08	1.6
		Cleaned grain			< 0.05	N/A	0.07	0.9	< 0.05	<1.0
		Epidermis/husk			< 0.05	N/A	0.09	1.1	< 0.05	<1.0
		Coarse bran			< 0.05	N/A	0.15	1.9	< 0.05	<1.0
		Straight flour			< 0.05	N/A	< 0.05	< 0.6	< 0.05	<1.0
		Fine bran			< 0.05	N/A	0.15	1.9	< 0.05	<1.0
		Middlings			< 0.05	N/A	0.07	0.9	< 0.05	<1.0
		Shorts			< 0.05	N/A	0.11	1.4	< 0.05	1.0
		Germ			< 0.05	N/A	0.2	2.5	0.06	1.2
		Low grade meal			< 0.05	N/A	0.08	1.0	< 0.05	<1.0
		White flour			< 0.05	N/A	< 0.05	< 0.6	< 0.05	<1.0
		Whole meal flour			< 0.05	N/A	0.06	0.8	< 0.05	<1.0
		Bread			< 0.05	N/A	< 0.05	< 0.6	< 0.05	<1.0
RCN R05185 (Clinton, IL, USA, 2004)	Wheat/ Excel 201	Grain RAC	1120	20	< 0.05	-	0.09	-	0.06	-
		Cleaned grain			< 0.05	N/A	0.1	1.1	0.06	1.0
		Epidermis/husk			< 0.05	N/A	0.07	0.8	< 0.05	< 0.8
		Coarse bran			< 0.05	N/A	0.2	2.2	0.08	1.3
		Straight flour			< 0.05	N/A	< 0.05	< 0.6	< 0.05	< 0.8
		Fine bran			< 0.05	N/A	0.26	2.9	0.08	1.3
		Middlings			< 0.05	N/A	< 0.05	< 0.6	< 0.05	< 0.8

Trial Identification (City, State/ Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	T		TA		TAA	
					mg/kg	PF	mg/kg	PF	mg/kg	PF
		Shorts			< 0.05	N/A	0.13	1.4	0.06	1.0
		Germ			< 0.05	N/A	0.32	3.6	0.07	1.2
		Low grade meal			< 0.05	N/A	0.12	1.3	0.06	1.0
		White flour			< 0.05	N/A	< 0.05	< 0.6	< 0.05	< 0.8
		Whole meal flour			< 0.05	N/A	0.08	< 0.9	< 0.05	< 0.8
		Bread			< 0.05	N/A	< 0.05	< 0.6	< 0.05	< 0.8
RCN R05186 (Cass, ND, USA, 2005)	Wheat/ Knudson	Grain RAC	1120	22	< 0.05	-	0.31	-	0.09	-
		Cleaned grain			< 0.05	N/A	0.28	0.9	0.08	0.9
		Epidermis/husk			< 0.05	N/A	0.09	0.3	0.09	1.0
		Coarse bran			< 0.05	N/A	0.56	1.8	0.12	1.3
		Straight flour			< 0.05	N/A	0.13	0.4	0.07	0.8
		Fine bran			< 0.05	N/A	0.56	1.8	0.1	1.1
		Middlings			< 0.05	N/A	0.18	0.6	0.08	0.9
		Shorts			< 0.05	N/A	0.27	0.9	0.08	0.9
		Germ			< 0.05	N/A	0.46	1.5	0.09	1.0
		Low grade meal			< 0.05	N/A	0.23	0.7	0.08	0.9
		White flour			< 0.05	N/A	0.17	0.5	0.07	0.8
		Whole meal flour			< 0.05	N/A	0.25	0.8	0.07	0.8
		Bread			< 0.05	N/A	0.15	0.5	0.06	0.7
RCN R05187 (York, NE, USA, 2004)	Wheat/ Millenium HRW	Grain RAC	1120	20	< 0.05	-	0.2	-	0.1	-
		Cleaned grain			< 0.05	N/A	0.19	1.0	0.1	1.0
		Epidermis/husk			< 0.05	N/A	0.14	0.7	0.11	1.1
		Coarse bran			< 0.05	N/A	0.6	3.0	0.11	1.1
		Straight flour			< 0.05	N/A	0.07	0.4	0.09	0.9
		Fine bran			< 0.05	N/A	0.58	2.9	0.12	1.2
		Middlings			< 0.05	N/A	0.12	0.6	0.09	0.9
		Shorts			< 0.05	N/A	0.2	1.0	0.1	1.0
		Germ			< 0.05	N/A	0.44	2.2	0.1	1.0
		Low grade meal			< 0.05	N/A	0.15	0.8	0.09	0.9
		White flour			< 0.05	N/A	0.09	0.5	0.09	0.9
		Whole meal flour			< 0.05	N/A	0.19	1.0	0.09	0.9
		Bread			< 0.05	N/A	0.12	0.6	0.07	0.7

Sugar cane

The transfer of residues of metconazole into processed commodities was investigated in sugar cane from one supervised field trial conducted in the USA (White, 2013, METCON_153). The trial was performed at an exaggerated rate of 4×500 g ai/ha (5×) with an interval of 13–14 days and harvest at 14 DALA. Sugar cane stalks were processed to refined sugar, blackstrap molasses using common commercial practices. All samples were analysed for residues of *cis*- and *trans*-metconazole and its metabolites M11, M21, M30, T, TAA and TA using method D0604. Procedural recoveries for all trials and analytes were within 70–120%. Samples of the RAC and processed commodities were stored frozen up to 18 months.

Residues of metabolites M11, M21, M30, 1,2,4-triazole, triazolyl alanine and triazolyl acetic acid were each below their LOQ of 0.01 or 0.05 mg/kg in maize RAC and processed commodities.

Table 239 Summary of the sum of *cis*- and *trans*-metconazole residues in sugar cane processed commodities.

Trial Identification (City, State/Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	Total Residues (mg/kg)	Processing Factor
08-TX24 (Weslaco, TX, USA,	Sugar cane/	RAC	2000	14	0.098	-
		Ref. sugar			< 0.01	< 0.10

Trial Identification (City, State/Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	Total Residues (mg/kg)	Processing Factor
2005) USA, 2008)	TCP87–3388	Molasses			0.12	1.3

Oilseed rape

The transfer of residues of metconazole into processed commodities was investigated in oilseed rape from four supervised field trial conducted in Germany (Tandy, 2013, METCON_172). The trials were performed at an exaggerated rate of 2 × 240 g ai/ha (2×) with an interval of 12–17 days and harvest at 65–78 DALA. Oilseed rape seeds were processed into meal, crude oil (hot hexane extraction), refined oil, soap stock and press cake using common commercial practices. All samples were analysed for residues of *cis*- and *trans*-metconazole using method No 535/1, while for metabolites 1,2,4-triazole (T), triazolyl alanine (TA), triazolyl acetic acid (TAA) and triazole lactic acid (TLA) method 01062/M003 was used. Overall mean procedural recoveries for all commodities and analytes were within 70–120% with an RSD of < 20%.

Table 240 Summary of the sum of *cis*- and *trans*-metconazole residues in oilseed rape processed commodities.

Trial Identification (City, State/Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	Total Residues (mg/kg)	Processing Factor
L110292 (Wischhafen, Germany, 2011)	Oilseed rape/ Visby	Seed (RAC)	480	76	0.23	-
		Meal			0.21	0.91
		Crude oil			0.37	1.61
		Refined oil			0.37	1.61
		Soap stock			0.064	0.28
		Press cake			0.28	1.22
L110293 (Blumberg, Germany, 2011)	Oilseed rape/ Petrol	Seed (RAC)	480	67	0.047	-
		Meal			0.051	1.09
		Crude oil			0.074	1.57
		Refined oil			0.069	1.47
		Soap stock			< 0.01	0.21
		Press cake			0.059	1.26
L110294 (Ölbronn-Dürn, Germany, 2011)	Oilseed rape/ Artoga	Seed (RAC)	480	78	0.10	-
		Meal			0.10	1.00
		Crude oil			0.16	1.60
		Refined oil			0.16	1.60
		Soap stock			0.033	0.30
		Press cake			0.13	1.30
L110295 (Apensen, Germany, 2011)	Oilseed rape/ Visby	Seed (RAC)	480	65	0.24	-
		Meal			0.22	0.92
		Crude oil			0.43	1.79
		Refined oil			0.43	1.79
		Soap stock			0.052	0.21
		Press cake			0.29	1.21

RAC: raw agricultural commodity

Table 241 Summary of residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA), triazolyl acetic acid (TAA) and triazole lactic acid (TLA) in oilseed rape processed commodities.

Trial Identification (City, State/ Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	T		TA		TAA		TLA	
					mg/kg	PF	mg/kg	PF	mg/kg	PF	mg/kg	PF

Trial Identification (City, State/ Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	T		TA		TAA		TLA	
					mg/kg	PF	mg/kg	PF	mg/kg	PF	mg/kg	PF
L110292 (Wischhafen, Germany, 2011)	Oilseed rape/ Visby	Seed (RAC)	480	76	< 0.01	-	0.34	-	< 0.01	-	< 0.01	-
		Meal			< 0.01	N/A	0.59	1.74	< 0.01	N/A	0.024	N/A
		Crude oil			< 0.01	N/A	< 0.01	< 0.03	< 0.01	N/A	< 0.01	N/A
		Refined oil			< 0.01	N/A	< 0.01	< 0.03	< 0.01	N/A	< 0.01	N/A
		Soap stock			< 0.01	N/A	< 0.01	< 0.03	< 0.01	N/A	< 0.01	N/A
		Press cake			< 0.01	N/A	0.53	1.56	< 0.01	N/A	0.016	N/A
L110293 (Blumberg, Germany, 2011)	Oilseed rape/ Petrol	Seed (RAC)	480	67	< 0.01	-	1.5	-	0.015	-	0.034	-
		Meal			< 0.01	N/A	3.1	2.07	0.032	2.13	0.084	2.47
		Crude oil			< 0.01	N/A	< 0.01	< 0.01	< 0.01	< 0.67	< 0.01	< 0.29
		Refined oil			< 0.01	N/A	< 0.01	< 0.01	< 0.01	< 0.67	< 0.01	< 0.29
		Soap stock			< 0.01	N/A	< 0.01	< 0.01	< 0.01	< 0.67	< 0.01	< 0.29
		Press cake			< 0.01	N/A	2.2	1.47	0.020	1.33	0.057	1.68
L110294 (Ölbronn-Dürn, Germany, 2011)	Oilseed rape/ Artoga	Seed (RAC)	480	78	< 0.01	-	0.94	-	< 0.01	-	0.040	-
		Meal			< 0.01	N/A	1.7	1.81	0.014	N/A	0.068	1.70
		Crude oil			< 0.01	N/A	< 0.01	< 0.01	< 0.01	N/A	< 0.01	< 0.25
		Refined oil			< 0.01	N/A	< 0.01	< 0.01	< 0.01	N/A	< 0.01	< 0.25
		Soap stock			< 0.01	N/A	< 0.01	< 0.01	< 0.01	N/A	< 0.01	< 0.25
		Press cake			< 0.01	N/A	1.4	1.49	0.011	N/A	0.061	1.53
L110295 (Apensen, Germany, 2011)	Oilseed rape/ Visby	Seed (RAC)	480	65	< 0.01	-	0.30	-	< 0.01	-	< 0.01	-
		Meal			< 0.01	N/A	0.67	1.96	< 0.01	N/A	0.019	N/A
		Crude oil			< 0.01	N/A	< 0.01	< 0.02	< 0.01	N/A	< 0.01	N/A
		Refined oil			< 0.01	N/A	< 0.01	< 0.02	< 0.01	N/A	< 0.01	N/A
		Soap stock			< 0.01	N/A	< 0.01	< 0.02	< 0.01	N/A	< 0.01	N/A
		Press cake			< 0.01	N/A	0.56	1.60	< 0.01	N/A	0.018	N/A

RAC: raw agricultural commodity

A second processing study with oilseed rape seeds was performed from one supervised field trial conducted in the USA (Green, 2006, METCON_162). The trial was performed with an exaggerated rate of 1 ×700 g ai/ha (5×) with harvest and collection at 35 DALA and 49 DALA, respectively. Oilseed rape seeds were processed into meal and refined oil using common commercial practices. All samples were analysed for *cis*- and *trans*-metconazole according to method RM–41C–1 and for the triazole metabolites (1,2,4-triazole, triazolyl alanine, and triazolyl acetic acid) according to method Meth–160. Overall mean procedural recoveries for all commodities and analytes were within 70–120% with an RSD of < 20%. However, recoveries for the triazole metabolites were corrected for blank values. Samples of the RAC and processed commodities were stored frozen up to 2.2 months for the analysis of metconazole and up to 7.4 months for analysis of the triazole metabolites.

Table 242 Summary of the sum of *cis*- and *trans*-metconazole residues in oilseed rape processed commodities.

Trial Identification (City, State/Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days) [a]	Total Residues (mg/kg)	Processing Factor (STMR)
V–29989-06-H (Velva, ND, USA, 2006)	Oilseed rape/ Invigor 5550	Seed (RAC)	708	35/49	< 0.02	-
		Meal			< 0.02	N/A
		Refined oil			< 0.02	N/A

RAC: raw agricultural commodity

[a] Days after last application; cut / collected

Table 243 Summary of residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA) and triazolyl acetic acid (TAA) in oilseed rape processed commodities.

Trial Identification (City, State/ Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days) [a]	T		TA		TAA	
					mg/kg	PF	mg/kg	PF	mg/kg	PF
V–29989-06-H (Velva, ND, USA, 2006)	Oilseed rape/ Invigor 5550	Seed (RAC)	708	35/49	< 0.003	-	0.61 Control: 0.39	-	0.008 Control: 0.006	-
		Meal			< 0.007	N/A	1.3 Control: 0.99	2.1	0.011 Control: 0.011	1.4
		Refined oil			< 0.003	N/A	< 0.003	< 0.005	0.007 Control: 0.007	1.0

RAC: raw agricultural commodity

[a] Days after last application; cut / collected

Cotton seed

The transfer of residues of metconazole into processed commodities was investigated in cotton seed from one supervised field trial conducted in the USA (Carringer, 2007, METCON_164). The trial was performed with 3 applications using an exaggerated rate of 550 g ai/ha with an interval of 7 days and harvest at 31 DALA. Cotton seeds were processed to meal, hulls and refined oil (hot hexane extraction, followed by refining) using common commercial practices. All samples were analysed for residues of *cis*- and *trans*-metconazole and its metabolites M11, M21, M30, T, TAA and TA using method D0604. Procedural recoveries for all commodities and analytes were within 70–120%. Samples of the RAC and processed commodities were stored frozen up to 6.4 months.

Residues of metabolites M11, M21 and M30 were each below their LOQ of 0.01 mg/kg in cotton seed RAC and processed commodities.

Table 244 Summary of the sum of *cis*- and *trans*-metconazole residues in cotton seed processed commodities.

Trial Identification (City, State/Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	Total Residues (mg/kg)	Processing Factor
RCN R06454 (Uvalde, TX, USA, 2006)	Cotton seed/ DPL 444	Cotton seed RAC	1650	31	0.13	-
		Meal			< 0.01	< 0.076
		Hulls			0.016	0.12
		Refined oil			0.016	0.12

RAC: raw agricultural commodity

Table 245 Summary of residues of metabolites 1,2,4-triazole (T), triazolyl alanine (TA) and triazolyl acetic acid (TAA) in cotton seed processed commodities.

Trial Identification (City, State/ Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days)	T		TA		TAA	
					mg/kg	PF	mg/kg	PF	mg/kg	PF
RCN R06454 (Uvalde, TX, USA, 2006)	Cotton seed/ DPL 444	Cotton seed RAC	1650	31	< 0.01	-	0.13	-	< 0.01	-
		Meal			< 0.01	N/A	0.16	1.2	< 0.01	N/A
		Hulls			< 0.01	N/A	< 0.05	< 0.4	< 0.01	N/A
		Refined oil			< 0.01	N/A	< 0.05	< 0.4	< 0.01	N/A

Peanut

The transfer of residues of metconazole into processed commodities was investigated in peanuts from one supervised field trial conducted in the USA (Green, 2006, METCON_165). The trial was performed with an exaggerated rate of 2 × 1400 g ai/ha (5×) with an interval of 13 days and harvest at 18 DALA. Peanuts were processed into meal and refined oil using common commercial practices. All samples were analysed according to method RM–41C–1. Overall mean procedural recoveries for *cis*- and *trans*-metconazole in all commodities were within 70–120% and < 20% RSD. Samples of the RAC and processed commodities were stored frozen up to 4.2 months.

Table 246 Summary of the sum of *cis*- and *trans*-metconazole residues in peanut processed commodities.

Trial Identification (City, State/Region, Country, Year)	Crop/ Variety	Commodity or Matrix	Total Rate (g ai/ha)	PHI (days) [a]	Total Residues (mg/kg)	Processing Factor (STMR)
V–25689-05-N (Greenville, MS, USA, 2005)	Peanut/ Georgia Green	Seed (RAC)	2800	18	0.06	-
		Meal			0.05	0.8
		Refined oil			0.08	1.4

RAC: raw agricultural commodity

[a] Average of 3 analyses

Table 247 Overview of processing factors for MRL and STMR-P calculation.

Raw commodity	Processed commodity	Individual processing factors	Median or best estimate processing factor
Plum	Dried plum	2.3	2.3
Soya bean	Hulls	0.86, 1.3, 2.6	1.3
	Meal	0.48, < 0.53, 0.69	0.53
	Crude oil	0.76, 0.84, 1.0	0.84
	Refined oil	< 0.48, < 0.53, 0.69	
Sugar beet	Pulp (ext.)	0.7, 1.0, 3.9	1.0
	Dried pulp	4.4, 9.2, 41	9.2
	Water	< 0.4, < 0.6, 1.4	0.6
	Raw juice	0.5, < 0.6, 1.5	0.6
	Lime sludge	0.5, < 0.6, 0,8	0.6
	Thin juice	< 0.4, < 0.6, 2.1	0.6
	Thick juice	< 0.6, 0.8, 2.5	0.8
	Molasses	1.0, 1.3, 3.9	1.3
	Raw sugar	0.9, 1.2, 4.4	1.2
	Ref. sugar	0.5, < 0.6, 1.2	0.6
Barley	Pot barley	0.09, 0.47, 0.51, 0.54	0.49
	Flour	1.5, 2.3, 2.8, 2.9	2.6
	Bran	2.6, 2.7, 4.0, 4.9	3.4
	Brewing malt	0.16, 0.59, 0.63, 0.67	0.61
	Malt sprouts	0.19, 0.36, 0.59, 0.71	0.48
	Beer	< 0.002, < 0.07, < 0.13, < 0.42	0.1
	Brewer's grain (dried)	0.38, 1.9, 2.2, 2.2	2.1
	Brewer's yeast	0.05, 0.19, 0.37, 0.54	0.28
Oat	Flour	0.14, 0.16, 0.20, 0.22	0.18
	Groats/rolled oats	0.07, 0.12, < 0.15, 0.17	0.14
	Husks	2.2, 2.1, 4.0, 4.4	3.1

Raw commodity	Processed commodity	Individual processing factors	Median or best estimate processing factor
	Dust	1.6, 3.7, 4.0, 4.6	3.9
	Bran	0.16, 0.31, 0.43, 0,50	0.37
Maize	Grits	N/A	N/A
	Meal	N/A	N/A
	Flour	N/A	N/A
	Refined oil (dry milling)	N/A	N/A
	Starch	N/A	N/A
	Refined oil (wet milling)	N/A	N/A
Wheat	Agf	64	64
	Cleaned grain	0.89, 0.90, 0.94, 1.1	0.92
	Epidermis/husk	29, 53, 56, 347	55
	Straight flour	0.14, 0.14, 0.23, 0.31	0.19
	Coarse bran	1.6, 1.8, 2.0, 2.1	1.9
	Fine bran	1.6, 1.8, 2.1, 2.2	2.0
	Whole meal flour	0.39, 0.60, 0.88, 0.91	0.74
	Flour	0.18, 0.21, 0.24, 0.42	0.23
	Germ	0.64, 0.92, 1.1, 1.2	1.0
	Middlings	0.81, 0.98, 1.1, 5.1	1.0
	Shorts	1.5, 2.2, 2.2, 2.4	2.2
	Low grade meal	0.56, 0.66, 0.78, 0.81	0.72
	Bread	0.44, 0.58, 0.63, 0.70	0.61
Sugar cane	Ref. sugar	< 0.10	< 0.10
	Molasses	1.3	1.3
Oil seed rape	Meal	0.91, 0.92, 1.0, 1.1	0.96
	Crude oil	1.6, 1.6, 1.6, 1.8	1.6
	Refined oil	1.5, 1.6, 1.6, 1.8	1.6
	Soap stock	0.21, 0.21, 0.28, 0.30	0.25
	Press cake	1.2, 1.2, 1.3, 1.3	1.3
Cotton seed	Meal	< 0.076	0.076
	Hulls	0.12	0.12
	Refined oil	0.12	0.12
Peanut	Meal	0.8	0.8
	Refined oil	1.4	1.4

RESIDUES IN ANIMAL COMMODITIES

Farm animal feeding studies

Lactating cows

The transfer of residues of metconazole into animal matrices was investigated in a study with dairy cows (Green, 2006, METCON_174). The study was conducted at treatment rates of 5 (1×), 15 (3×), and 50 (10×) ppm (0.20, 0.57 and 1.7 mg/kg bw) for 28 days.

The cows in the treatment groups (three animals per group) were treated with metconazole in gelatin capsules once daily. Milk samples were collected twice daily and pooled. On day 24, whole milk samples were centrifuged to obtain skim milk and cream samples. One animal dropped out of the 1× group at day 11. Hence, samples were only collected up to this day. All cows were sacrificed

within 24 hours of administration of the last dose. Samples of liver, kidney, muscle, and fat were collected and taken for analysis.

Milk and cream samples were analysed for *cis*- and *trans*-metconazole using method RM-41M-1 with an LOQ of 0.02 mg/kg and 0.04 mg/kg, respectively. Tissues samples were analysed according to method RM-41M-2 for *cis*- and *trans*-metconazole and according to method RM-41M-3 for metabolites M1 (free and conjugated) and M12, both methods with a LOQ of 0.02 mg/kg. Maximum storage time of milk and tissue samples for the analysis of cis- and trans-metconazole was 50 days, while for the analysis of M1 and M12 in tissues the maximum frozen storage period was 181 days.

In milk, skim milk and cream residues of *cis*- and *trans*-metconazole were <LOQ in the 10× dosing group throughout the study. The findings in tissues are summarized inTable 248.

Table 248 Residues of metconazole and metabolites M1 and M12 in cow tissues

Dosing group	Residues found in mg/kg (mean)		
	Sum of cis- and trans-metconazole	M1 (free and conjugated)	M12 (free)
Milk			
10× (50 ppm)	3×< 0.04	-	-
Muscle			
10× (50 ppm)	3×< 0.04	-	-
Fat			
10× (50 ppm)	3×< 0.04	-	-
Kidney			
1× (5 ppm)	-	3×< 0.02	3×< 0.02
3× (15 ppm)	-	3×< 0.02	0.02, 2×< 0.02 (0.02)
10× (50 ppm)	3×< 0.04	< 0.02, 0.03, 0.02 (0.02)	< 0.02, 0.06, 0.04 (0.04)
Liver			
1× (5 ppm)	-	3×< 0.02	-
3× (15 ppm)	3×< 0.04	3×< 0.02	3×< 0.02
10× (50 ppm)	3×< 0.04	< 0.02, 0.05, < 0.02 (0.03)	3×< 0.02

Laying hens

The transfer of residues of metconazole into animal matrices was investigated in a study with laying hens (Green, 2008, METCON_173). The study was conducted at treatment rates of 2 (1×), 6 (3×), and 20 (10×) ppm (2.1, 6.2 and 20 mg/kg bw) for 28 days.

The hens in the treatment groups (12 animals per group) were treated with metconazole via a balling gun twice daily. Eggs were collected twice daily throughout the study period. All hens were sacrificed on the day after the last dose and samples of liver, muscle and fat were collected and taken for analysis.

Egg and tissue samples were analysed for *cis*- and *trans*-metconazole using method RM–41M–2, while metabolites M1 (free and conjugated) and M12 (free) in tissues were analysed using method RM–41M–3 with a limit of quantification of 0.02 mg/kg. Triazole metabolites were analysed using method Meth–160, revision 2 with and LOQ of 0.01 mg/kg. Maximum storage time of milk and tissue samples for the analysis of *cis*- and *trans*-metconazole was 26 days, while for the analysis of the triazole metabolites maximum storage was 135 days. For the analysis of M1 and M12 in tissues the maximum frozen storage period was 246 days.

The residue levels in eggs and tissues are summarized in Table 249 and Table 250 respectively. In eggs, residue levels reached a plateau in the 20 ppm group after approximately 6 days, (Figure 5). Residues of triazole metabolites occurring in poultry diet were up to < 0.003 mg/kg,

0.026 mg/kg and < 0.003 mg/kg for 1,2,4-triazole, triazolyl alanine and triazolyl acetic acid, respectively.

Table 249 Residues of metconazole in eggs.

Sampling Interval (days)	Residues in mg/kg (mean)					
	2 ppm		6 ppm		20 ppm	
	Sum of *cis*- and *trans*-metconazole	1,2,4-triazole	Sum of *cis*- and *trans*-metconazole	1,2,4-triazole	Sum of *cis*- and *trans*-metconazole	1,2,4-triazole
–1	3×< 0.04 (< 0.04)	-	3×< 0.04 (< 0.04)	-	3×< 0.04 (< 0.04)	-
1	3×< 0.04 (< 0.04)	-	3×< 0.04 (< 0.04)	-	3×< 0.04 (< 0.04)	0.013 < 0.01 < 0.01 (0.01)
3	3×< 0.04 (< 0.04)	-	3×< 0.04 (< 0.04)	-	0.027 0.074 0.033 (0.043)	-
7	3×< 0.04 (< 0.04)	-	3×< 0.04 (< 0.04)	-	0.034 0.045 0.058 (0.045)	0.022 0.021 0.019 (0.021)
10	3×< 0.04 (< 0.04)	-	3×< 0.04 (< 0.04)	3×< 0.01 (< 0.01)	0.042 0.049 0.080 (0.055)	0.019 0.021 0.017 (0.019)
14	3×< 0.04 (< 0.04)	-	3×< 0.04 (< 0.04)	-	0.050 0.086 0.048 (0.054	0.022 0.021 0.017 (0.020)
17	3×< 0.04 (< 0.04)	-	3×< 0.04 (< 0.04)	-	0.027 0.070 0.066 (0.053)	-
20	3×< 0.04 (< 0.04)	-	3×< 0.04 (< 0.04)	3×< 0.01 (< 0.01)	0.043 0.075 0.077 (0.062)	0.017 0.015 0.015 (0.016)
24	3×< 0.04 (< 0.04)	-	3×< 0.04 (< 0.04)	-	0.035 0.034 0.054 (0.041)	-
26	3×< 0.04 (< 0.04)	-	3×< 0.04 (< 0.04)	-	0.031 0.037 0.035 (0.034)	-
28	3×< 0.04 (< 0.04)	3×< 0.01 (< 0.01)	3×< 0.04 (< 0.04)	3×< 0.01 (< 0.01)	0.038 0.034 0.045 (0.039)	0.023 0.026 0.023 (0.024)

Table 250 Residues of metconazole metabolites in poultry tissues.

Dosing group	Residues found in mg/kg (mean)

	Sum of *cis*- and *trans*-metconazole	1,2,4-triazole	M1 (free and conjugated)	M12 (free)
Muscle				
1× (2 ppm)	3×< 0.04 (< 0.04)	3×< 0.01 (< 0.01)	-	-
3× (6 ppm)	3×< 0.04 (< 0.04)	0.011 < 0.01 0.011 (0.010)	-	-
10× (20 ppm)	3×< 0.04 (< 0.04)	0.031 0.026 0.029 (0.028)	3×< 0.02 (< 0.02)	-
Fat				
1× (2 ppm)	3×< 0.04 (< 0.04)	-	-	-
3× (6 ppm)	3×< 0.04 (< 0.04)	-	-	-
10× (20 ppm)	3×< 0.04 (< 0.04)	3×< 0.01 (< 0.01)	3×< 0.02 (< 0.02)	-
Liver				
1× (2 ppm)	3×< 0.04 (< 0.04)	3×< 0.01 (< 0.01)	3×< 0.02 (< 0.02)	-
3× (6 ppm)	3×< 0.04 (< 0.04)	0.010 < 0.01 0.011 (0.010)	< 0.02 < 0.02 0.03 (0.02)	-
10× (20 ppm)	3×< 0.04 (< 0.04)	0.030 0.026 0.032 (0.029)	0.03 0.05 0.05 (0.04)	3×< 0.02 (< 0.02)

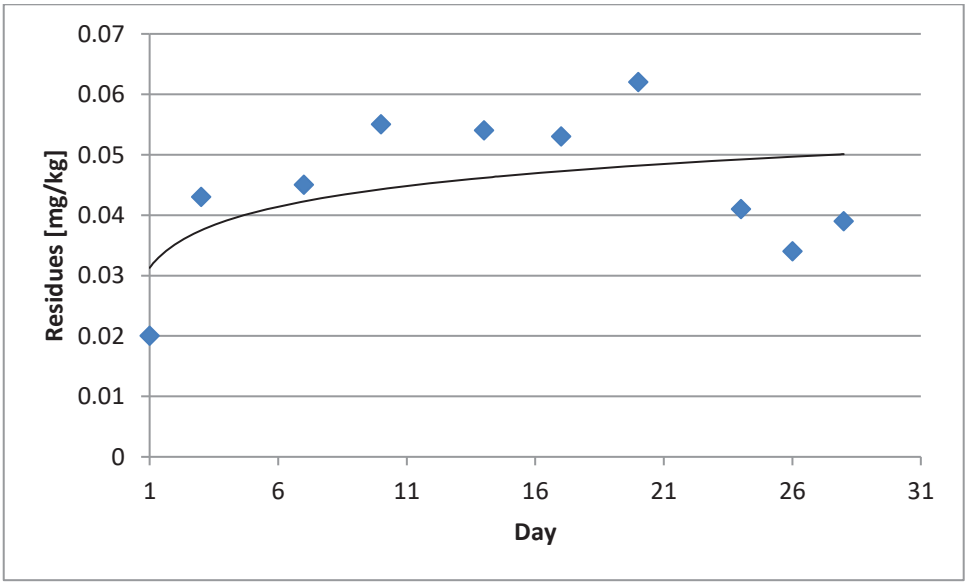
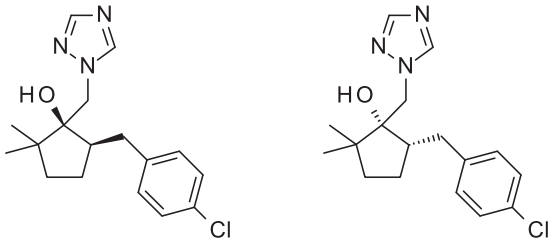


Figure 5 Time course of the concentrations of metconazole in eggs.

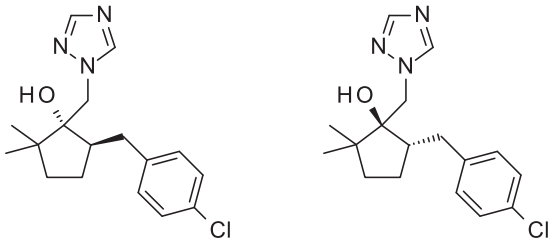
APPRAISAL

Metconazole is a systemic triazole fungicide and plant growth regulator. It acts by inhibiting ergosterol biosynthesis. Metconazole was scheduled by the Fiftieth Session of the CCPR for first evaluation by the 2019 JMPR for toxicology and residues.

The Meeting received information on identity, physicochemical properties, metabolism (plant, confined rotational crops and animals), environmental fate, field rotational crops, methods of residue analysis, freezer storage stability, registered use patterns, supervised residue trials, fate of residues in processing, and livestock feeding studies.



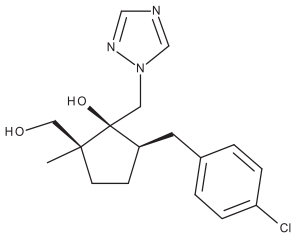
cis-isomers
Reg.no. 4079468

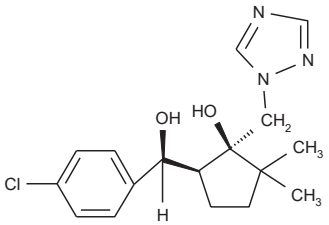
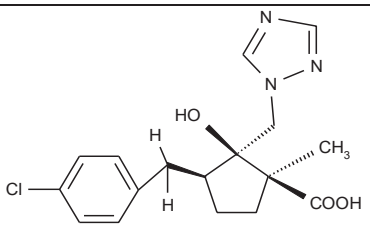
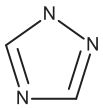
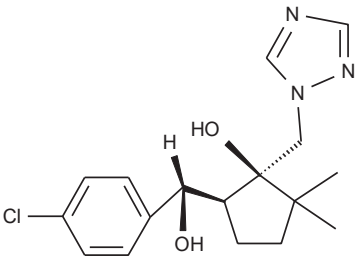
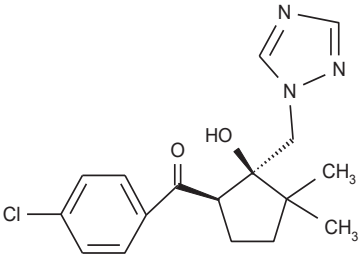
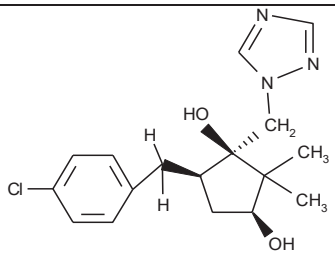
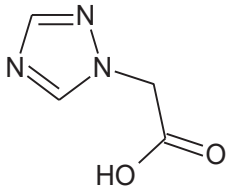


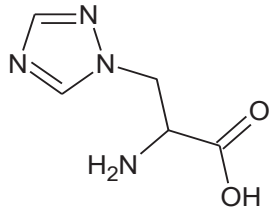
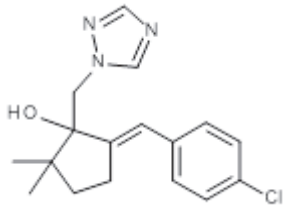
trans-isomers
Reg.no. 4079654

The IUPAC name of metconazole is (1*RS*,5*RS*;1*RS*,5*SR*)-5-(4-chlorobenzyl)-2,2-dimethyl-1-(1*H*-1,2,4-triazol-1-ylmethyl)cyclopentanol. The isomeric ratio of cis- and trans-metconazole is at about 80–85:15–20 (molecular weight of metconazole is 319.8).

Table 1 Overview of metabolites referred to in the appraisal

Code Names	Chemical Names (IUPAC)	Structure
M1 CL 359451	(1SR,2SR,5RS)-5-(4-chlorobenzyl)-2-(hydroxymethyl)-2-methyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol (Molecular weight of M1 is 335.8)	

Code Names	Chemical Names (IUPAC)	Structure
M11 CL 382390	(1RS,5SR)5-[(SR)-(4-chlorophenyl)(hydroxy)methyl]-2,2-dimethyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol	
M12 (4543815) CL 359138	(1RS,2SR,3RS)-3-(4-chlorobenzyl)-2-hydroxy-1-methyl-2-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanecarboxylic acid (Molecular weight of M12 is 349.8)	
M20 87084 M555F020	1,2,4-(1H)-triazole	
M21 CL 197130	(1RS,5SR)-5-[(RS)-(4-chlorophenyl)(hydroxy)methyl]-2,2-dimethyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol	
M30 4110625 CL 382389 M555F030cis	(1RS,5SR)-5-(4-chlorobenzoyl)-2,2-dimethyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol	
M31 5968488	(1RS,3SR,5RS)-5-(4-chlorobenzyl)-2,2-dimethyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentane-1,3-diol	
M34 Triazolyl acetic acid WL 161417	2-(1,2,4-triazol-1-yl)acetic acid	

Code Names	Chemical Names (IUPAC)	Structure
M35 Triazolyl alanine WL161416 CL 147267	2-amino-3-(1H-1,2,4-triazol-5-yl)propanoic acid	
M40 M555F040	(5Z)-5-(4-chlorobenzylidene)-2,2-dimethyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol	

PHYSICAL AND CHEMICAL PROPERTIES

Metconazole is not volatile. It generally has a higher solubility in organic solvents in comparison to water. The n-octanol water partition coefficient log P_{ow} is 3.8 at 20 °C, suggesting that the parent has the potential to partition into fat. Metconazole was shown to be hydrolytically stable at pH 4, 7 and 9.

Plant metabolism

The Meeting received plant metabolism studies in wheat, canola, banana, mandarins and peas following application of either [triazole-^{14}C]-, [cyclopentyl-^{14}C]- or [p-chlorophenyl-^{14}C]-metconazole.

Mandarin

On mandarins, [cyclopentyl-^{14}C]- and [triazole-^{14}C]-radiolabelled metconazole were applied in a single foliar application at a rate equivalent to 0.2 kg ai/ha at the fruit stage (about 2 months before maturity). Fruit and leaf samples were taken at 0 (immediately after the treatment), 28 and 56 days after treatment (DAT). A subset of fruits were also separated into peel and pulp.

TRRs were highest in leaves ranging between 3.1–4.8 mg eq/kg, while levels in fruits were significantly lower ranging between 0.072–0.13 mg eq/kg.

Mandarin leaves and fruits were surface rinsed with methanol, followed by extraction with methanol/water (1:1, v/v) for the leaves and methanol/water (7:3, v/v) for peel and pulp. Conjugates in extracts were hydrolyzed by treatment with either 0.1 mol/L HCl (100 °C, 1 d) or cellulase. Radioactivity in the surface rinse from fruits dropped from > 80% TRR at 0 DAT to 12–15% TRR at 56 DAT. Total extracted radioactivity (rinse + extract) in the leaves and whole fruits ranged between 90–99% TRR and 93–100% TRR, respectively.

Parent metconazole was the predominant residue in mandarin fruits accounting for 47–94% TRR (0.034–0.12 mg eq/kg) and in leaves accounting for 45–95% (1.5–4.6 mg eq/kg). No major metabolites were identified. The sum of other metabolites, including isomers of hydroxylated metconazole as well as conjugates, accounted for 32–36% TRR (0.024–0.039 mg eq/kg) in 28 and 56 DAT fruits and 33–37% TRR (1.1–1.2 mg eq/kg) in leaves.

Banana

On banana, [triazole-^{14}C]- and [*p*-chlorophenyl-^{14}C]-radiolabelled metconazole were applied in five foliar applications at 14-day intervals from flowering, at a rate equivalent to 0.14 kg ai/ha per

application. Banana fruits were sampled at 0 DALA (56 DAT1) and a subsample separated into peel and pulp.

TRRs were highest in banana peel ranging between 1.6–2.5 mg eq/kg, while levels in banana pulp were significantly lower ranging between 0.61–0.78 mg eq/kg.

Banana samples were extracted with methanol, followed by 2% HCl in methanol. Extracted radioactivity in the whole fruit, as well as in peel and pulp ranged between 96–98% TRR.

Parent metconazole was the predominant residue in all matrices accounting for 86–89% TRR (0.52–2.2 mg eq/kg). No major metabolites were identified.

Peas

On peas, [triazole-^{14}C]- and [*p*-chlorophenyl-^{14}C]-radiolabelled metconazole were applied in two (green pea scenario) or three (dry pea scenario) foliar applications at a rate equivalent to 0.22 kg ai/ha per application and a retreatment interval of 13–14 days. Foliage samples were taken after each treatment at 0, 13, 27 DAT1. For the green pea scenario (peas and foliage) samples were harvested at 26 DAT1 (13 DAT2) (BBCH 79) and for the dry pea scenario (peas and straw) at 42 DAT1 (15 DALA) (BBCH 89).

TRRs were highest in pea straw (dry pea scenario) ranging between 49–168 mg eq/kg, followed by foliage (green pea scenario) at up to 21 mg eq/kg. In pea seed, the TRR was higher in the dry pea scenario with 0.2–3.9 mg eq/kg compared to the green pea scenario with 0.038–1.6 mg eq/kg.

All samples except pea seeds were surface extracted by submersion in acetone/water (7:3), followed by extraction with acetone and acetone/methanol/water (1:1:1) for forage 0 and 13 DAT1 and with methanol/water (4:1) and water for forage 27 DAT1, straw and seeds. To liberate conjugates, aliquots of the straw extracts (15 DALA) were subjected to acidic hydrolysis (1 mol/L HCl, refluxed for 5 h) and additionally incubated with β-glucosidase. Extracted radioactivity ranged between 97–100% TRR in foliage, 91–94% in straw (both scenarios) and 85–100% TRR in seeds (both scenarios).

In both scenarios, parent metconazole was a major residue in foliage, straw and seeds (*p*-chlorophenyl-label only) accounting for 67–96% TRR (4.8–10 mg eq/kg), 54–68% TRR (4.6–33 mg eq/kg) and 21–36% TRR (0.016–0.043 mg eq/kg), respectively. The only major identified metabolite was triazolyl alanine in pea seeds at 75–85% TRR (1.2–3.2 mg eq/kg). Additionally, a mixture of isomers of hydroxylated metconazole as well as conjugates were identified at up to 38% TRR (23 mg eq/kg) in pea straw.

Wheat

On wheat, [triazole-^{14}C]- or [cyclopentyl-^{14}C]-metconazole were applied in one foliar application at BBCH 57–60 using a rate equivalent to 0.36–0.37 kg ai/ha. Samples of straw and grain were taken at 61 or 74 DAT.

Maximum TRR levels for both labels ranged between 5.9–6.3 mg eq/kg in straw, and in grain were 0.074 mg eq/kg (cyclopentyl-label) and 0.66 mg eq/kg (triazole-label).

Samples were sequentially extracted with acetone and acetonitrile (triazole-label only), as well as with acetonitrile/water (at various ratios) and water. Extracted radioactivity was equal to 82–92% TRR in grain and 74–81% TRR in straw.

While parent metconazole was not detected in wheat grain, it accounted for 19–32% TRR (1.2–1.9 mg eq/kg) in wheat straw. In wheat grain, major identified metabolites were triazolyl alanine at 69% TRR (0.46 mg eq/kg) and triazolyl acetic acid at 23% TRR (0.16 mg eq/kg). In wheat straw, major identified metabolites were M11 at 9.8% TRR (0.58 mg eq/kg) and M21 at 9.7% TRR (0.57 mg eq/kg).

Rape seed

On rape seed, [triazole-^{14}C]- or [p-chlorophenyl-^{14}C]-metconazole were applied in two foliar applications at a rate equivalent to 0.26–0.27 kg ai/ha per application. The first treatment occurred at BBCH 65 (full flowering); while the second treatment occurred 14 days later at BBCH 67 (flowering declining). Oilseed rape foliage was sampled at 0 DAT1, 0 DALA (14 DAT1), 14 DALA (28 DAT1) and 28 DALA (42 DAT1), while the pods and seeds were harvested at 44–50 DALA.

TRRs were highest in foliage (28 DALA) at up to 20 mg eq/kg and in pods at up to 21 mg eq/kg, while levels in seeds were significantly lower ranging between 1.9–2.4 mg eq/kg.

Foliage and pods were extracted with methanol (pods were soaked in water overnight prior to extraction), while seeds were extracted with hexane, followed by methanol and water. Extracted radioactivity ranged between 61–98% TRR in foliage, 65–74% in pods and 72–80% TRR in seeds.

Parent metconazole was the predominant residue in foliage, pods (*p*-chlorophenyl-label only) and seeds accounting for 40–96% TRR (2.6–13 mg eq/kg), 21% TRR (4.4 mg eq/kg) and 20–29% TRR (0.47–0.53 mg eq/kg), respectively. The only major identified metabolite was triazolyl alanine in oilseed rape seeds at 39% TRR (0.92 mg eq/kg). Additionally, a mixture of glucose conjugates of metconazole and monohydroxylated metconazole metabolites were identified at up to 63% TRR (12 mg eq/kg) in pods.

In summary, metconazole was only moderately metabolized in studies performed with wheat, oilseed rape, banana, mandarin and pea. Parent metconazole was a major residue (19–96% TRR) in all crops, except wheat grain where it was not detected. Major identified metabolites were triazolyl alanine accounting for 39–69% TRR in wheat grain, oilseed rape seed and pea seed, as well as triazolyl acetic acid accounting for 23% TRR in wheat grain. In wheat straw, metabolites M11 accounted for 9.8% TRR and M21 for 9.7% TRR. Additionally, significant residues of hydroxylated metconazole metabolites and/or their conjugates were detected in mandarin fruit, pea seed and oilseed rape seed, ranging between 19–67% TRR.

Animal metabolism

The Meeting received studies on the metabolism of metconazole in laboratory animals, lactating goats and laying hens. The evaluation of the metabolism studies in rats was carried out by the WHO Core Assessment Group.

Goats

In lactating goats, the metabolic fate of metconazole was investigated using [cyclopentyl-^{14}C]-or [triazole-^{14}C]-metconazole. In two studies [cyclopentyl-^{14}C]-metconazole was administered orally at different isomeric ratios: a) a *cis:trans* ratio of 85:15 was administered to two lactating goats at 14 ppm (0.47 mg/kg bw per day) and 24 ppm (0.48 mg/kg bw per day) for 3–4 consecutive days; b) the *cis*-isomer only was administered to one goat at 11 ppm (0.64 mg/kg bw per day) for 4 consecutive days. Moreover, in a third study, [triazole-^{14}C]-radiolabelled metconazole containing a *cis:trans* ratio of 85:15 was administered to one goat at 10 ppm (0.46 mg/kg bw per day) for 4 consecutive days.

For both labels most of the administered radioactivity was recovered from urine (28–43% AR) and faeces (25–50% AR). In edible tissues residues were low in all studies. The highest TRRs were found in liver ranging from 0.22 mg eq/kg (10 ppm dose rate) to 0.56 mg eq/kg (24 ppm dose rate) and in kidney ranging from 0.11 mg eq/kg (10 ppm dose rate) to 0.28 mg eq/kg (24 ppm dose rate); while in other edible tissues residue levels were significantly lower (0.001–0.015 mg eq/kg).

In milk, the radioactive residues ranged between 0.011–0.017 mg eq/kg for both labels. A plateau was reached after approximately 3 days in the studies dosed at 10–14 ppm. However, for the study using [cyclopentyl-^{14}C]-metconazole dosed at 24 ppm, no plateau was reached after 4 days.

Tissue samples of the [cyclopentyl-^{14}C]-metconazole dosed goats were extracted with acetonitrile, followed by acetonitrile/water 1:1, v/v) or acetonitrile/ water (9:1, v/v), followed by

methanol, while tissues of the [triazole-^{14}C]-metconazole dosed goat were extracted with acetonitrile, followed by a single extraction with water and ethanol. Resulting extraction rates were 94–96% TRR in liver and 96–98% TRR in kidney. To liberate conjugates, extracts of the [cyclopentyl-^{14}C]- and [triazole-^{14}C]-metconazole dosed goats were hydrolysed with 2 mol/L HCl or 6 mol/L HCl, respectively.. It was also recognized that a shift of the *cis:trans* ratio of metconazole indicated a faster metabolism of the *cis* isomer.

Identification and characterization of the radioactivity in liver and kidney was done in all studies and in one study additionally in muscle and fat. Metconazole (sum of free and conjugated) was the major identified residue in liver, accounting for 33–42% TRR (0.09–0.24 mg eq/kg), with the contribution of conjugated metconazole being about 6–10%. Additionally, several metabolites were detected for both labels at significant levels: M1 (conjugated) in kidney ranging between 12–14% TRR (0.014–0.038 mg eq/kg); M12 (free) in kidney ranging between 13–21% TRR (0.020–0.055 mg eq/kg) and M31 (free and conjugated) in liver and kidney ranging between 15–24% TRR (0.022–0.063 mg eq/kg). Levels of M1 and M12 in kidney were 4–12 times higher compared to parent, while levels of M31 were similar, or below parent. 1,2,4-triazole was not detected in any of the samples from the [triazole-^{14}C]-metconazole dosed goat.

Laying hens

In laying hens, the metabolic fate of metconazole was investigated using [cyclopentyl-^{14}C]-or [triazole-^{14}C]-metconazole. In three separate studies, [cyclopentyl-^{14}C]-metconazole was administered orally to laying hens at 7 ppm (0.6 mg/kg bw per day) for 28 consecutive days, at 8 ppm (0.64 mg/kg bw per day) for 14 consecutive days or at 14 ppm (0.73 mg/kg bw per day) for 4.5 consecutive days. In the third study, [triazole-^{14}C]-radiolabelled metconazole was also administered to laying hens at 13 ppm (0.75 mg/kg bw per day) for 4.5 consecutive days.

Most of the administered radioactivity was recovered from excreta (91–97% AR). In egg whites the radioactive residues ranged between < 0.001–0.09 mg eq/kg (cyclopentyl-label) and < 0.001–0.17 mg eq/kg (triazole-label) and in egg yolk between < 0.001–0.18 mg eq/kg (cyclopentyl-label) and < 0.001–0.16 mg eq/kg (triazole-label). TRR levels in eggs did reach a plateau after 8 days. In edible tissues the highest TRRs were found in liver at 0.60–0.79 mg eq/kg (cyclopentyl-label) and 0.97 mg eq/kg (triazole-label) and in kidney at 0.33–0.36 mg eq/kg (cyclopentyl-label); while in other edible tissues residue levels were significantly lower at 0.024–0.13 mg eq/kg (cyclopentyl-label) and 0.14–0.19 mg eq/kg (triazole-label).

In the third study, dosing [cyclopentyl-^{14}C]-metconazole at 14 ppm and [triazole-^{14}C]-metconazole at 13 ppm for 4.5 days, samples were extracted for the purpose of characterization of the radioactive residue. Samples of liver, breast muscle, thigh muscle, abdominal fat, skin with fat, egg white and egg yolk, were extracted three times with acetonitrile, followed by two times with water. Insoluble oily droplets were dissolved with hexane. The extract (cyclopentyl label only) and PES from liver samples of both labels was hydrolysed with 6 mol/L and 2 mol/L HCl, respectively. Extractability ranged for all matrices between 86–99% TRR.

Parent metconazole was identified as a major residue for both labels in abdominal fat at 35–37% TRR (0.033–0.050 mg eq/kg) and skin with fat at 20–28% TRR (0.021–0.027 mg eq/kg), as well as for [cyclopentyl-^{14}C]-metconazole in egg yolk at 11% TRR (0.010 mg eq/kg). In tissues of hens treated with the [triazole-^{14}C]-metconazole, metabolite 1,2,4-triazole was also quantified in all tissues at levels ranging between 27–77% TRR (0.019–0.27 mg eq/kg). Several additional metabolites were detected for both labels at significant levels: M1 (free and conjugated) in liver at 16% TRR (0.13 mg eq/kg) and M12 (free and conjugated) in liver at 12% TRR (0.091 mg eq/kg). The sum of the co-eluting metabolites M1 and M31 in abdominal fat, skin with fat and egg yolk, as well as whole egg accounted for 11–28% TRR (0.010–0.025 mg eq/kg).

In summary, extensive metabolic degradation of metconazole was observed with similar pathways in lactating goats and laying hens. Parent metconazole (mostly unconjugated) was quantified at major amounts in goats (liver) and hens (fat, skin and egg yolk), accounting for 11–42%

TRR. Major metabolites were M1 at 12–16% TRR and M12 at 12–21% TRR in goats (kidney) and hens (liver), as well as M31 at 15–24% TRR in goats (liver & kidney). The sum of metabolites M1 and M31 accounted for 11–28% TRR in hens (fat, skin and egg yolk). Metabolite 1,2,4-triazole was quantified in all tissues of laying hens at 27–77% TRR.

ENVIRONMENTAL FATE IN SOIL

The Meeting received studies on aerobic soil degradation, soil photolysis, confined rotational crop metabolism and field rotational crops.

Aerobic soil degradation

In aerobic soil degradation studies, moderate degradation of ^{14}C-metconazole was observed with estimated half-lives in various soils ranging from 84–128 days. The only identified metabolites were M30 at up to 4.9% AR, M40 (and/or unknown) at up to 1.8% AR and 1,2,4-triazole at up to 1.2% AR.

Half-lives of ^{14}C-metconazole for soil photolysis under the assumption of an average daylight period of 12 hours were estimated at 63–136 days (1st order kinetics) and 73 days (square root 2nd order kinetics). The only identified metabolite was M30 at up to 3.7% AR. The Meeting concluded that photolysis does not represent a significant degradation pathway for metconazole.

Confined rotational crops

A confined rotational crop metabolism study was conducted with [cyclopentyl-^{14}C]- and [triazole-^{14}C]-radiolabelled metconazole applied at a rate equivalent to 0.4 kg ai/ha to a sandy loam soil. After plant-back intervals (PBIs) of 30 and 120 days the nature and level of radioactive residues were investigated in lettuce, radish and wheat.

At 120-days PBI, the measured TRR was often at similar or higher levels compared to the 30-day PBI. At harvest, the highest total radioactive residues were found in wheat straw (0.61–0.73 mg eq/kg). In edible commodities radioactive residues were highest in radish root, up to 0.71 mg eq/kg (triazole-label, 120 DAT) and 0.37 mg eq/kg (cyclopentyl-label, 120 DAT), followed by wheat grain, up to 0.49 mg eq/kg (triazole-label, 120 DAT), and lettuce leaf up to 0.2 mg eq/kg (triazole-label, 120 DAT) and 0.10 mg eq/kg (cyclopentyl-label, 120 DAT).

All samples were extracted with acetonitrile/water at various ratios and water. Subsequently the extracts were partitioned with ethyl acetate, dichloromethane or hexane. Conjugates present in the extracts were hydrolyzed by either acid (2 mol/L HCl) or base hydrolysis (0.1 mol/L NaOH). For both labels and PBIs, the extracted radioactivity in radish (root and tops), lettuce, wheat straw and wheat grain ranged between 84–97% TRR.

Parent metconazole was identified as the major component in radish roots and tops at the 30-day PBI at 15–41% TRR (0.07–0.13 mg eq/kg) and in lettuce at the 120-day PBI at 20% TRR (0.02 mg eq/kg). Metconazole was also a major residue in radish from the 120-day PBI and lettuce and wheat straw from the 30-day PBI, but could not be unequivocally identified due to interference.

Metabolite M35 (triazolyl alanine) was a major residue in the 30-day PBI radish roots and tops, as well as in the 120-day wheat grain making up 18–59% TRR (0.07–0.29 mg eq/kg), while M34 (triazolyl acetic acid) was found at up to 20% TRR (0.10 mg eq/kg) in the 120–day PBI wheat grain. Metabolite M12 was a significant residue in the 30-day PBI radish tops at up to 14% TRR (0.09 mg eq/kg), but was not found in the 120-day PBI samples. Additionally, glycoside conjugates were detected at up to 18% TRR (0.13 mg eq/kg) in wheat straw at the 120-day PBI.

In two field rotational crop trials, conducted in Germany, metconazole was applied twice to bare soil a rate of 0.09 kg ai/ha with an interval of 21 days. Carrots and lamb's lettuce were planted 30-31 DALA while winter wheat was planted 98–99 DALA. Carrots and lamb's lettuce were sampled at the earliest time the crop could be commercially used and at maturity. Winter wheat was sampled immature (whole plant, ears and rest of plant) and at maturity (grain and straw).

Residues of metconazole in crops planted at 30/31 days (carrot and lamb's lettuce) and 99 days (winter wheat) after treatment of the soil were not quantifiable (LOQ: 0.01 mg/kg; straw: 0.03 mg/kg).

The Meeting noted that residues of metconazole are moderately persistent in soil (DT_{50} up to 128 days). In the confined rotational crop metabolism study performed at 0.4 kg ai/ha, metconazole was the predominant residue in all plant commodities, except wheat grain. Also, the concentrations in the 30– and 120-day PBI samples were in the same range or increased with time, reaching up to 0.13 mg eq/kg in edible parts.

The two field rotational crop studies performed at 2 × 0.09 kg ai/ha did not result in any detectable residues of metconazole in succeeding crops. Data from field trials on potato treated at a rate of 4 × 0.14 kg ai/ha (approx. 3 times higher compared to the available field rotational crop data) resulted in no residues >LOQ. The Meeting concluded that there is no concern for carry over of metconazole residues in rotational crops.

In addition to parent metconazole, the metabolites triazolyl alanine and triazolyl acetic acid, common to the whole group of triazole fungicides, were found.

METHODS OF RESIDUE ANALYSIS

The Meeting received analytical methods for the determination of metconazole and metabolites M11, M21 and M30 in plant matrices, as well as for the triazole metabolites 1,2,4-triazole, triazolyl alanine, triazolyl acetic acid and triazolyl lactic acid.

For matrices of plant origin, most methods employed extraction with acetone/hexane, acetone/water, acetonitrile, acetonitrile/water, methanol or methanol/water. Clean-up was done by either liquid-liquid partitioning alone or in combination with GPC or SPE. Parent metconazole was determined by LC-MS/MS, GC-NPD or GC-MS, while all metabolites were determined by LC-MS/MS only. Among all available methods, the validated LOQ for parent metconazole ranged between 0.005–0.05 mg/kg. For the metabolites M11, M21 and M30, the LOQ was at 0.01 mg/kg or 0.02 mg/kg, and for the triazole metabolites at 0.01 mg/kg, except for one method for triazolyl acetic acid where the LOQ was also at 0.05 mg/kg. Mean recoveries were, with few exceptions, within the acceptable range of 70–120% with a RSD of < 20%.

For animal matrices, methods were provided for parent metconazole and metabolites M1, M12 and 1,2,4-triazole.

In animal matrices, most methods employed extraction with acetone/water, ethyl acetate/methanol, acetonitrile, methanol or methanol/water. Clean-up was done by either liquid-liquid partitioning alone or in combination with SPE. Conjugates of M1 were additionally cleaved by acidic hydrolysis using 3 mol/L HCl. Parent metconazole was determined by LC-MS/MS or GC-NPD, while all metabolites were determined by LC-MS/MS only. The method for 1,2,4-triazole also involved a derivatization step with dansyl chloride. Among the available methods, the validated LOQ for parent metconazole ranged between 0.005–0.02 mg/kg. For metabolites M1 and M12 the validated LOQ was equal to 0.02 mg/kg and for 1,2,4-triazole equal to 0.01 mg/kg. Mean recoveries were within the acceptable range of 70–120% with a RSD of < 20%.

The Meeting concluded that suitable data generation and monitoring methods are available to measure residues of metconazole and metabolites M11, M21 and M30, 1,2,4-triazole, triazolyl alanine, triazolyl acetic acid and triazolyl lactic acid in plants, as well as parent metconazole and metabolites M1, M12 and 1,2,4-triazole in animal commodities.

The Meeting also noted that with the DFG S19 method, a suitable multi-residue method for the monitoring of metconazole residues in plant and animal matrices is available.

Stability of residues in stored analytical samples

The Meeting received information on the storage stability of *cis*- and *trans*-metconazole and metabolites M21, M11, M30, 1,2,4-triazole, triazolyl alanine and triazolyl acetic acid in a variety of plant matrices stored under frozen conditions.

Residues of *cis*- and *trans*-metconazole were stable in high starch matrices for at least 12 months (wheat grain and carrot), for at least 31 months (potato) and at least 26 months (radish root); in high protein matrices for at least 14 months (pea seed); in high water matrices for least 12 months (lettuce); in high oil matrices for at least 12 months (rape seed and oil) and for at least 26 months (soya bean seed); and in blueberries for least 9 months. Additionally, storage stability in wheat hay was demonstrated for at least 26 months.

Metabolites M11 and M21 were stable in high starch matrices (wheat grain, sugar beet root), high water content matrices (radish tops) and high oil matrices (soya bean seed) for at least 26 months. Additionally, storage stability in wheat straw and hay was demonstrated for at least 26 months.

Metabolite M30 was stable in high starch matrices for at least 26 months (wheat gain) and up to 12 months (sugar beet root). In high water content matrices (radish tops) and high oil matrices (soya bean seed), as well as in wheat straw and hay M30 was stable for up to 12 months.

Metabolite 1,2,4-triazole was stable in high water content matrices (radish tops) for at least 26 months, and in high starch matrices (radish root) as well as in high oil content matrices (soya bean seed) for up to 12 months.

Metabolites triazolyl alanine and triazolyl acetic acid were stable in high starch matrices (wheat gain, radish roots), high water content matrices (radish tops) and high oil matrices (soya bean seed) for at least 26 months.

For animal matrices, the Meeting received information on the storage stability of *cis*- and *trans*-metconazole and metabolites M1 and M12 in animal matrices stored at -20 °C.

Residues of *cis*- and *trans*-metconazole were not stable in muscle and liver, but stable in fat for up to 3 months. Metabolite M1 was stable in liver for at least 9 months and in kidney, muscle, and fat for at least 8 months. Metabolite M12 was stable in liver and kidney for at least 8 and 9 months, respectively.

DEFINITION OF THE RESIDUE

In the plant metabolism studies conducted on wheat, canola, banana, mandarins and peas, the predominant residue was parent metconazole at 20–29% TRR in rape seeds, 86–89% TRR in banana, 47–94% TRR in mandarins and 21–36% TRR in pea. Only in wheat grain were no parent metconazole or metconazole specific metabolites detected (parent metconazole was detected frequently in cereal grain from field trials). In feed matrices, residues of metconazole ranged from 19–32% TRR in wheat straw, 40–96% TRR in rape forage, 67–96% TRR in pea foliage (vines) and 54–68% TRR in pea straw (hay/fodder).

Analytical methods are capable of monitoring metconazole in all plant matrices.

The Meeting concluded that parent metconazole (sum of *cis* and *trans* isomer) is a major residue in plants and is a suitable marker compound for compliance with MRLs.

On deciding which compounds should be included in the residue definition for risk assessment, the Meeting considered the likely occurrence of the compounds and the toxicological properties of the candidates M11, M21 and M30. All three metabolites were analysed in various food and feed commodities from supervised field trials, but residues were only found in cereal commodities. These metabolites were also identified in plant metabolism studies, but always as minor components of the residue (up to 30% of parent).

Metabolites M11, M21 and M30 were either not detected in the rat or only at small amounts (M21 at < 1–6% AD), and no indications of genotoxicity were identified. Therefore, the TTC approach for a Cramer Class III compound was applied.

Estimated long-term exposures were based on uses in plant and animal commodities and using maximum values found in supervised field trials. Actual measured concentrations from field trials were used where metabolites M11, M21, and M30 were analysed in the field trials. In trials where only metconazole was measured, a maximum value was estimated assuming 30% contribution of each metabolite relative to parent. The estimated long-term maximum dietary exposures for metabolites M11, M21 and M30 were 0.81 µg/kg bw per day –for each metabolite.

The Meeting noted that the estimated exposures for metabolites M11, M21 and M30 are each below the threshold of toxicological concern for Cramer Class III compounds (1.5 µg/kg bw per day), and concluded that dietary exposure to these metabolites is unlikely to present a public health concern.

Triazole derived metabolites were found in significant amounts in wheat grain, oilseed rape seed and pea seed (triazolyl alanine), as well as in wheat grain (triazolyl acetic acid) from primary plant metabolism studies. Moreover, these two metabolites were also frequently detected in crops from supervised field trials (e.g. cereal grains). The Meeting concluded that these metabolites can arise from other sources and have toxicities known to be different from metconazole. These metabolites should be assessed separately, considering their source and respective toxicities, and were not further considered in the current evaluation.

In primary metabolism studies, significant residues of unidentified hydroxylated metconazole metabolites and/or their conjugates were detected in mandarin fruit, pea seed and oilseed rape seed, ranging between 19–67% TRR. These metabolites occurred at lower or similar levels relative to parent metconazole, except for pea seed. Since no genotoxicity was indicated for hydroxylated metconazole metabolites, the TTC approach for Cramer Class III compounds was applied. Estimated long-term exposure was based on consumption of plant and animal commodities and using maximum values of parent metconazole found in supervised field trials corrected for the estimated fraction of the hydroxylated metconazole metabolites.

The following factors were derived from results in metabolism studies (mandarin, pea, oilseed rape) comparing parent and total hydroxylated metconazole metabolites (free and conjugated) and assigning them to associated crops to reflect their nature, where possible. If a crop could not be assigned to a matching matrix from the metabolism studies, the most conservative factor of 3.6 was applied (e.g. bulb and root vegetables).

Stone fruit, blueberries:	0.6 (mandarin fruit, 28 DAT)
Banana	0.06 (mandarin fruit, 0 DAT)
Green beans, sweet corn:	3.6 (green pea)
Dried peas, soya beans, cereal grain, maize:	3.0 (dry pea)
Sugar cane, soya bean forage, sugar beet tops, maize forage, rape forage:	0.8 (mandarin leaf)
Oilseeds (oilseed rape, sunflower, cotton seed), peanuts, tree nuts:	2.1 (rape seed)
Straw, hay, stover, almond hulls, cotton gin by-product:	0.5 (pea straw)
Bulb onion, garlic, potato, sugar beet:	3.6 (unassigned)

The estimated long-term maximum dietary exposure, calculated for the total of hydroxylated metconazole metabolites, was 0.75 µg/kg bw per day.

The Meeting noted that the estimated exposure is below the threshold of toxicological concern for Cramer Class III compounds (1.5 µg/kg bw per day) and concluded that dietary exposure to these metabolites is unlikely to present a public health concern.

The Meeting agreed the definition of the residue for dietary risk assessment for plant commodities should be: metconazole (sum of cis and trans isomer)

In animal metabolism studies performed with lactating goats and laying hens, parent metconazole (mostly unconjugated) was quantified at major amounts in goats (liver) and hens (fat, skin and egg yolk), accounting for 11–42% TRR. Major metabolites were M1 (free and conjugated) at 12–16% TRR and M12 (free and conjugated) at 12–21% TRR in goats (kidney) and hens (liver), as well as M31 (free and conjugated) at 15–24% TRR in goats (liver & kidney). The sum of metabolites M1 and M31 accounted for 11–28% TRR in hens (fat, skin and egg yolk). Additionally, metabolite 1,2,4-triazole was quantified in all tissues of laying hens at 27–77% TRR.

A cow feeding study was conducted at treatment rates of 5, 15 and 50 ppm in the diet. In milk no residues >LOQ (0.02 mg/kg) were detected in all dose groups. Residues of parent metconazole were <LOQ (0.04 mg/kg) in muscle, fat, liver and kidney in the highest dose group. Metabolite M1 (free and conjugated) was quantified in the highest dose group in kidney and liver at up to 0.02 mg/kg and 0.03 mg/kg, respectively. Additionally, metabolite M12 (free) was quantified only in kidney from the 15 ppm dose group at 0.02 mg/kg and from the 50 ppm dose group at 0.04 mg/kg.

A poultry feeding study was conducted at treatment rates of 2, 6 and 20 ppm. While residues of parent metconazole in eggs were <LOQ in the lower dose groups, residues ranged between 0.043–0.062 mg/kg at the highest dose group. In tissues, no residues of parent metconazole were detected >LOQ in any dose group. Metabolite M1 was quantified in liver only at the 6 ppm level at 0.02 mg/kg and at the 20 ppm level at 0.04 mg/kg. Additionally, metabolite 1,2,4-triazole was quantified in eggs in the 20 ppm dose group ranging between 0.010–0.024 mg/kg as well as in muscle and liver at 0.028 mg/kg and at 0.029 mg/kg, respectively.

Parent metconazole was identified as a major residue in liver, fat skin and egg yolk during animal metabolism studies. Additionally, it was the only identified compound in eggs during a poultry feeding study. While no suitable marker compound could be identified for all matrices, parent was generally present. Hence, the Meeting decided to include only metconazole (sum of cis and trans isomers) into the residue definition for compliance with MRLs. Analytical methods are capable of measuring metconazole in animal matrices.

In muscle and fat tissues of all animals investigated, residue concentrations were of similar proportions. The log P_{ow} of metconazole is 3.8. The Meeting concluded that residues are not fat-soluble.

On deciding which compounds should be included in the residue definition for risk assessment, the Meeting considered the likely occurrence of the compound and its toxicological properties for the candidates M1, M12 and M31. The three metabolites were detected in animal metabolism studies in their free and conjugated (conjugated fraction: M1: 83–100%; M12: 0% (ruminant); 64% (poultry); M31: 72–100%) forms in liver and kidney. However, levels of M1 (free and conjugated) and M12 (free) in their free form found in liver and kidney during ruminant and poultry feeding studies were low. Since the method used in the feeding studies did not include a hydrolysis step, residue levels could be underestimated for total free and conjugated M12 in poultry. M1 and M12 were observed in the rat and are of no greater toxicity than parent metconazole and are covered by its toxicological reference values. Therefore, the Meeting decided to include the metabolites into the residue definition for dietary exposure purposes. Metabolite M31 was not detected in the rat and no indications on genotoxicity were identified. Therefore, the TTC approach for a Cramer Class III compound was applied. Potential long-term exposure to M31 was estimated using the maximum values found in liver and kidney in the metabolism studies.

The estimated long-term maximum dietary exposure, calculated for metabolite M31 was 0.01 µg/kg bw per day.

The Meeting noted that the estimated dietary exposure to M31 is below the threshold of toxicological concern for Cramer Class III compounds (1.5 µg/kg bw per day) and concluded that dietary exposure to this metabolite is unlikely to be of public health concern.

Triazole metabolite 1,2,4-triazole was found in significant amounts in a poultry metabolism study and feeding study. The Meeting concluded that triazole metabolites, such as 1,2,4-triazole, can arise from other sources and have toxicities known to be different from metconazole. These metabolites should be assessed separately, considering their source and respective toxicities and were not further considered in the current evaluation.

For dietary exposure purposes for animal commodities, based on the results of the animal metabolism studies, the Meeting decided to include metabolites M1 and M12 (free and conjugated) in the residue definition, together with parent metconazole (sum of *cis* and *trans* isomer).

Definition of the residue for compliance with the MRL for plant and animal commodities: *Metconazole (sum of cis and trans isomer)*

Definition of the residue for dietary risk assessment for plant commodities: *Metconazole (sum of cis and trans isomer)*

Definition of the residue for dietary risk assessment for animal commodities: *Sum of metconazole (cis and trans-isomer) and metabolites (1SR,2SR,5RS)-5-(4-chlorobenzyl)-2-(hydroxymethyl)-2-methyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol (M1; free and conjugated) and (1RS,2SR,3RS)-3-(4-chlorobenzyl)-2-hydroxy-1-methyl-2-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanecarboxylic acid (M12; free and conjugated), expressed as metconazole*

The residue is not fat-soluble.

RESULTS OF SUPERVISED RESIDUE TRIALS ON CROPS

Stone fruit (peach, plum, cherry)

The critical GAP for stone fruit in the USA allows three foliar applications of metconazole at 140 g ai/ha, at full bloom, petal fall and pre-harvest and a PHI of 14 days.

The ranked order of residues in peach approximating GAP treatment for estimating maximum residue levels and dietary risk assessment was (n = 8): 0.040(2), 0.045(3), 0.050, 0.060, 0.085 mg/kg.

The Meeting estimated a maximum residue level of 0.2 mg/kg, a STMR of 0.045 mg/kg and a HR of 0.09 mg/kg (highest individual value) for metconazole in the subgroup of peaches.

The ranked order of residues in plum approximating GAP treatment for estimating maximum residue levels and dietary risk assessment was (n = 5): < 0.04(2), 0.040(2), 0.045 mg/kg.

The Meeting estimated a maximum residue level of 0.1 mg/kg, a STMR of 0.040 mg/kg and a HR of 0.05 mg/kg (highest individual value) for metconazole in the subgroup of plums.

The ranked order of residues in cherry approximating GAP treatment for estimating maximum residue levels and dietary risk assessment was (n = 7): < 0.04, 0.040, 0.060, 0.070, 0.080, 0.090, 0.14 mg/kg.

The Meeting estimated a maximum residue level of 0.3 mg/kg, a STMR of 0.07 mg/kg and a HR of 0.16 mg/kg (highest individual value) for metconazole in the subgroup of cherries.

Blueberries

The critical GAP for blueberries in Canada allows three foliar applications of metconazole at 90 g ai/ha applied at flowering and pre-harvest with no more than two sequential applications and a PHI of 7 days.

Field trials conducted with blueberries in Canada and the USA were performed with three foliar applications of metconazole at rates of 90–100 g ai/ha with a RTI of 27–63 days between the first and second treatment and 6–14 days between the second and third treatment.

The ranked order of residues approximating GAP treatment for estimating maximum residue levels and dietary risk assessment was (n = 11): < 0.10(2), 0.12, 0.13, 0.14(2), 0.16, 0.18, 0.19, 0.20, 0.31 mg/kg.

The Meeting estimated a maximum residue level of 0.5 mg/kg, a STMR of 0.14 mg/kg and HR of 0.33 mg/kg (highest individual value) for metconazole in blueberries.

Banana

The critical GAP for banana in Mexico allows three foliar applications of metconazole at 90 g ai/ha with a RTI of 14 days and a PHI of 0 days.

Field trials conducted with banana in the Costa Rica (3), Ecuador (3), Honduras (3), and Mexico (3)were performed with seven foliar applications of metconazole at rates of 150 g ai/ha with an RTI of 11–15 days. Bananas were harvested at 0 DALA.

The ranked order of residues in these trials for estimating maximum residue levels and dietary risk assessment was (n = 12): < 0.10(12) mg/kg.

Although the number of applications in field trials was 7 instead of 3, the Meeting concluded that recommendations could be given since all residues even at the higher number of applications were <LOQ and estimated a maximum residue level of 0.1(*) mg/kg and a STMR and HR of 0.1 mg/kg in banana.

Bulb onions, Subgroup of

The critical GAP for bulb onion and garlic in Brazil allows three foliar applications of metconazole at 90 g ai/ha with a RTI of 7 days and a PHI of 14 days.

Bulb onion

Field trials conducted with bulb onion in Brazil were performed approximating the GAP.

The ranked order of residues in bulb onions following GAP treatment for estimating maximum residue levels and dietary risk assessment was (n = 3): < 0.02, < 0.05(2) mg/kg.

Garlic

Field trials conducted with garlic in Brazil were performed approximating the GAP.

The ranked order of residues in garlic following GAP treatment for estimating maximum residue levels and dietary risk assessment was (n = 3): < 0.02, < 0.05(2) mg/kg.

The Meeting decided to combine the data sets from bulb onions and garlic to mutually support maximum residue levels for bulb onion and garlic. The ranked order of residues following GAP treatment for estimating maximum residue levels and dietary risk assessment was (n = 6): < 0.02(2), ≤ 0.05(4) mg/kg.

The Meeting estimated a maximum residue level of 0.05(*) mg/kg, a STMR and HR of 0.05 mg/kg for metconazole in bulb onion and garlic.

Beans with pods (Phaseolus spp.) (immature pods and succulent seeds)

The critical GAP for green beans in Brazil allows three foliar applications of metconazole at 14 g ai/ha with a RTI of 7 days and a PHI of 15 days.

Field trials conducted with green beans in Brazil were performed with three foliar applications of metconazole at considerably higher rates of 45–180 g ai/ha with a RTI of 7 days and PHI of 14–15 days.

The ranked order of residues for estimating maximum residue levels and dietary risk assessment was (n = 4): < 0.02, < 0.05(3) mg/kg.

The Meeting noted that green beans fall under category 3 of the minor crop classification, requiring a minimum of five supervised field trials to estimate maximum residue levels. Although the number of trials was only 4, the Meeting estimated a maximum residue level of 0.05(*) mg/kg and a STMR and HR of 0 mg/kg, since no residues >LOQ were detected at a considerably higher treatment rates.

Dry beans (except soya beans), Subgroup of

The critical GAP for dry beans except soya beans in Canada and the USA allows two foliar applications of metconazole at 140 g ai/ha with a RTI of 7 days and a PHI of 21 days.

In field trials conducted with dry beans in Canada and the USA, the ranked order of residues following GAP treatment for estimating maximum residue levels and dietary risk assessment was (n = 18): < 0.04(18) mg/kg.

The Meeting noted that the GAP covers the subgroup of dry beans except soya beans and estimated a maximum residue level of 0.04(*) mg/kg, and a STMR of 0.04 mg/kg for metconazole in the subgroup of dry beans (except soya bean).

Soya beans

The critical GAP for soya beans in the USA allows two foliar applications of metconazole at 63 g ai/ha with a RTI of 10 days and a PHI of 30 days.

In field trials conducted with soya beans in the USA, the ranked order of residues for estimating maximum residue levels and dietary risk assessment was (n = 21): < 0.01(17), 0.011, 0.012, 0.030, 0.046 mg/kg. Using scaling a factor of 0.8, scaled residues in ranked order were (n = 21): < 0.01(17), 0.01(2), 0.024, 0.037

The Meeting estimated a maximum residue level of 0.04 mg/kg, and a STMR of 0.01 mg/kg for metconazole in soya beans.

Dry peas, Subgroup of

The critical GAP for dry peas in Canada and the USA allows two foliar applications of metconazole at 140 g ai/ha with a RTI of 7 days and a PHI of 21 days.

In field trials conducted with dry peas in Canada and the USA, the ranked order of residues following GAP treatment for estimating maximum residue levels and dietary risk assessment was (n = 14): < 0.04(5), 0.041, 0.042, 0.043, 0.048, 0.051, 0.056, 0.061, 0.073, 0.084 mg/kg.

The Meeting noted that the GAP covers the subgroup of dry peas and estimated a maximum residue level of 0.15 mg/kg, and a STMR of 0.0425 mg/kg for metconazole in the subgroup of dry peas.

Tuberous and corm vegetables,Subgroup of

The critical GAP for the subgroup of tuberous and corm vegetables in the USA allows four foliar applications of metconazole at 140 g ai/ha with a RTI of 7 days and a PHI of 1 day.

In field trials conducted with potato in the USA, the ranked order of residues following GAP treatment (± 25%) for estimating maximum residue levels and dietary risk assessment was (n = 14): < 0.04(14) mg/kg.

The Meeting noted that the GAP covers the subgroup of tuberous and corm vegetables and estimated a maximum residue level of 0.04(*) mg/kg, and a STMR and HR of 0 mg/kg for metconazole in the subgroup of tuberous and corm vegetables, including potato.

Sugar beet

The critical GAP for sugar beet in Canada allows two outdoor foliar applications of metconazole at 113 g ai/ha with a RTI of 14 days and a PHI of 14 days.

In field trials conducted with sugar beet in the USA, the ranked order of residues following GAP treatment (± 25%) for estimating maximum residue levels and dietary risk assessment was (n = 11): < 0.01, 0.010(3) 0.020(3), 0.022, 0.030(2), 0.044 mg/kg.

The Meeting estimated a maximum residue level of 0.07 mg/kg and a STMR of 0.02 mg/kg for metconazole in sugar beet.

Barley, oats, rye, wheat

The critical GAP for barley, oat, rye, triticale and wheat in the USA allows two outdoor foliar applications of metconazole at 112 g ai/ha with a RTI of 6 days and a PHI of 30 days.

The ranked order of residues in barley following GAP treatment (± 25%) for estimating maximum residue levels and dietary risk assessment was (n = 1): 0.83 mg/kg.

The Meeting concluded that no maximum residue level could be estimated for metconazole in barley.

The ranked order of residues in oats following GAP treatment (± 25%) for estimating maximum residue levels and dietary risk assessment was (n = 2): 0.21, 0.31 mg/kg.

The Meeting concluded that no maximum residue level could be estimated for metconazole in oat.

The ranked order of residues in rye following GAP treatment (± 25%) for estimating maximum residue levels and dietary risk assessment was (n = 3): 0.068, 0.074, 0.15 mg/kg.

The Meeting concluded that no maximum residue level could be estimated for metconazole in rye.

The ranked order of residues in wheat following GAP treatment (± 25%) for estimating maximum residue levels and dietary risk assessment was (n = 4): 0.011, 0.013, 0.015, 0.051 mg/kg.

The Meeting concluded that no maximum residue level could be estimated for metconazole in wheat.

Since the residue populations were significantly different according to the Kruskal-Wallis H-test between cereals, the Meeting decided that it was not possible to combine the data for mutual support.

Maize

The critical GAP for maize in the USA allows four foliar applications of metconazole at 92 g ai/ha with a RTI of 7 days and a PHI of 20 days.

In field trials conducted with maize in the USA, the ranked order of residues following GAP treatment (± 25%) for estimating maximum residue levels and dietary risk assessment was (n = 20): < 0.01(18), 0.010, 0.015 (highest individual value: 0.018) mg/kg.

The Meeting estimated a maximum residue level of 0.015 mg/kg, and a STMR of 0.01 mg/kg for metconazole in maize.

Sweet corn (Corn-on–the-cob)

The critical GAP for sweet corn in the USA allows four foliar applications of metconazole at 92 g ai/ha with a RTI of 7 days and a PHI of 7 days.

In field trials conducted with sweet corn in the USA the ranked order of residues following GAP treatment (± 25%) for estimating maximum residue levels and dietary risk assessment was (n = 12): < 0.01(11), 0.01 mg/kg.

The Meeting estimated a maximum residue level of (*)0.015 mg/kg, and a STMR and HR of 0.01 mg/kg for metconazole in sweet corn (Corn-on–the-cob).

Sugar cane

The critical GAP for sugar cane in the USA allows four foliar applications of metconazole at 91 g ai/ha with a RTI of 14 days and a PHI of 14 days.

In field trials conducted with sugar cane in the USA, the ranked order of residues following GAP treatment (± 25%) for estimating maximum residue levels and dietary risk assessment was (n = 8): < 0.01(2), 0.019, 0.020, 0.021, 0.023, 0.030, 0.036 mg/kg.

The Meeting estimated a maximum residue level of 0.06 mg/kg, a STMR of 0.0205 mg/kg and HR of 0.036 mg/kg for metconazole in sugar cane.

Tree nuts

The critical GAP for tree nuts in the USA allows four foliar applications of metconazole at 123 g ai/ha (pistachios: 140 g ai/ha) with a RTI of 7 days (14 days filberts and pistachios) and a PHI of 25 days.

Pecan nuts

Field trials with pecan nuts conducted in the USA were performed with 2 foliar applications of metconazole at rates of 268–306 g ai/ha with a 145–178 day interval between applications and harvested at 25 DALA.

The ranked order of residues in these trials for estimating maximum residue levels and dietary risk assessment was (n = 3): < 0.04(3) mg/kg.

Almonds

Field trials with almonds conducted in the USA were performed with 2 foliar applications of metconazole at rates of 153–307 g ai/ha and one trial at an exaggerated rate of 607–608 g ai/ha with a 133–155 day interval between applications and harvested at 25 DALA.

The ranked order of residues in these trials for estimating maximum residue levels and dietary risk assessment was (n = 7): < 0.04(7) mg/kg.

The Meeting noted that all trials for pecan and almonds were overdosed with the last application according to the PHI of the critical GAP and all residues were <LOQ, and decided to estimate a maximum residue level of 0.04(*) mg/kg and a STMR and HR of 0 mg/kg for the group of tree nuts.

Rape seed

The Meeting noted a GAP from the USA involving one single application of metconazole at 140 g ai/ha with a 35 day PHI. However, residue levels observed in oilseed rape from corresponding field trials in the USA indicated that this was not the most critical GAP available. Therefore, the Meeting based its recommendations on a more critical GAP as reflected in the European field trials.

The critical GAP for oilseed rape in Chile allows two foliar applications of metconazole at 90 g ai/ha with a PHI of 42 days.

Field trials conducted with oilseed rape in France were performed with two foliar applications of metconazole at rates of 90 g ai/ha (RTI not stated) and harvest at 39–70 DALA.

The ranked order of residues in rape seed following GAP treatment (± 25%) for estimating maximum residue levels and dietary risk assessment was (n = 2): 0.050, 0.090 mg/kg.

The critical GAP for oilseed rape in the United Kingdom allows a maximum of two foliar applications of metconazole at 72 g ai/ha at up to BBCH 71 (10% of pods at final size) with a RTI of 14 days.

In field trials conducted with oilseed rape in France, the ranked order of residues in rape seed following GAP treatment (± 25%) for estimating maximum residue levels and dietary risk assessment was (n = 11): < 0.02(5), 0.02(2), 0.04, 0.05, 0.07, 0.09 mg/kg.

Based on the UK GAP, which was supported with a sufficient number of supervised field trials, the Meeting estimated a maximum residue level of 0.15 mg/kg and a STMR of 0.02 mg/kg for metconazole in rape seed.

Sunflower seeds, Subgroup of

The critical GAP for sunflower in Canada and the USA allows two foliar applications of metconazole at 140 g ai/ha with a RTI of 7 days and a PHI of 21 days.

In field trials conducted with sunflower in Canada and the USA, the ranked order of residues in sunflower seeds following GAP treatment (± 25%) for estimating maximum residue levels and dietary risk assessment was (n = 7): < 0.04, 0.040, 0.043, 0.089, 0.096, 0.24, 0.68 mg/kg.

The Meeting estimated a maximum residue level of 1.5 mg/kg, and a STMR of 0.089 mg/kg for metconazole in the subgroup of sunflower seeds.

Cotton seed

The critical GAP for cotton seed in the USA allows three foliar applications of metconazole at 92 g ai/ha with a RTI of 7 days and a PHI of 30 days.

In field trials conducted with cotton in the USA, the ranked order of residues in cotton seed following GAP treatment (± 25%) for estimating maximum residue levels and dietary risk assessment was (n = 12): 0.020, 0.021, 0.022, 0.024(2), 0.027, 0.042, 0.051, 0.068, 0.071, 0.075, 0.23 mg/kg.

The Meeting estimated a maximum residue level of 0.3 mg/kg, and a STMR of 0.0345 mg/kg for metconazole in cotton seed.

Peanuts

The critical GAP for peanuts in the USA allows four foliar applications of metconazole at 140 g ai/ha with a RTI of 14 days and a PHI of 14 days.

Field trials conducted with peanuts in the USA were performed with two foliar applications of metconazole at rates of 270–290 g ai/ha and harvest at 13–15 DALA. Since no residues occurred at a 2× application rate, the Meeting assumed that four application at 1×, would also not result in residues >LOQ. Residue levels from additional trials performed at a 4× or 10× application rate were also <LOQ or only slightly above.

The ranked order of residues in peanut for estimating maximum residue levels and dietary risk assessment was (n = 14): < 0.04 mg/kg.

The Meeting estimated a maximum residue level of 0.04(*) mg/kg, and a STMR of 0.04 mg/kg for metconazole in peanuts.

Animal feed items

Soya bean forage

The critical GAP for soya bean forage in the USA allows two outdoor foliar applications of metconazole at 63 g ai/ha with no livestock feeding restrictions.

Field trials conducted with soya bean forage in the USA, were performed with two foliar applications of metconazole at rates of 80 g ai/ha with a PHI of 7–8 days. The Meeting noted that since there were no livestock feeding restrictions a 7 day pre-grazing or feeding interval would be practical.

The ranked order of residues was (n = 21): 0.56, 0.71, 0.73, 0.96, 1.0(2), 1.1, 1.2(3), 1.3, 1.4, 1.6, 1.7, 1.8, 1.9(4), 2.2(2) mg/kg (2.4 mg/kg highest individual). Using scaling a factor of 0.8, scaled residues in ranked order were (n = 21): 0.45, 0.57, 0.58, 0.77, 0.8(2), 0.88, 0.96(3), 1.0, 1.1, 1.3, 1.4(2), 1.5(4), 1.8(2) mg/kg (1.92 mg/kg highest individual scaled).

The Meeting estimated a highest residue of 1.92 mg/kg (as received) for metconazole in soya bean forages and a median residue of 1.0 mg/kg (as received).

Soya bean hay

The critical GAP for soya bean hay in the USA allows two outdoor foliar applications of metconazole at 63 g ai/ha with no livestock feeding restrictions.

Field trials conducted with soya bean hay in the USA were performed with two foliar applications of metconazole at rates of 80 g ai/ha and harvest 7–8 or 20 DALA. The Meeting noted that since there were no livestock feeding restrictions a minimum 7 day pre-grazing or feeding interval would be practical.

The ranked order of residues was (n = 21): 0.6, 1.1, 1.3, 1.4(3), 1.7, 2.0(2), 2.1(2), 2.3, 2.6(3), 3.0, 3.2(2), 3.3, 3.4, 3.9 mg/kg (4.0 mg/kg highest individual). Using scaling a factor of 0.8, scaled residues in ranked order were (n = 21): 0.48, 0.88, 1.0, 1.1(3), 1.4, 1.6(2), 1.7(2), 1.8, 2.1(3), 2.4, 2.6(3), 2.7, 3.1 mg/kg (3.2 mg/kg highest individual scaled).

The Meeting estimated a highest residue of 3.2 mg/kg (as received) for metconazole in soya bean hay, a median residue of 1.7 mg/kg (as received) and a maximum residue level of 8 mg/kg (DM, based on 85% DM content).

Sugar beet tops

The critical GAP for sugar beet in Canada allows two outdoor foliar applications of metconazole at 113 g ai/ha with no livestock feeding restrictions.

Field trials conducted with sugar beet in the USA were performed with two foliar applications of metconazole at rates of 109–114 g ai/ha and harvest at 14–15 DALA. The Meeting noted that sugar beet tops are normally harvested (or grazed) at the same time as beet harvesting. Hence, the 14 day PHI for beet would also reflect grower practice for sugar beet tops.

The ranked order of residues in sugar beet tops following GAP treatment was (n = 11): 0.09, 0.11, 0.12, 0.13, 0.14, 0.15, 0.58, 0.97, 1.0(2), 1.2 mg/kg as received.

The Meeting estimated a highest residue of 1.2 mg/kg (as received) for metconazole in sugar beet tops and a median residue of 0.15 mg/kg (as received).

Hay (barley, oats, rye, wheat)

The critical GAP for hay of wheat, oat, barley, rye and triticale in the USA allows two foliar applications of metconazole at 112 g ai/ha with no livestock feeding restrictions.

The ranked order of residues in barley hay following GAP treatment for estimating maximum residue levels and dietary risk assessment was (n = 11): 0.79, 0.82, 1.2, 1.5, 2.2, 3.0, 3.1, 3.2(2), 4.1, 4.4 mg/kg.

The ranked order of residues in oat hay following GAP treatment for estimating maximum residue levels and dietary risk assessment was (n = 12): 2.4, 2.6, 3.7, 3.8, 4.8, 4.9, 6.0, 6.1, 6.6, 9.4(2), 11 mg/kg.

The ranked order of residues in wheat hay following GAP treatment for estimating maximum residue levels and dietary risk assessment was (n = 15): 1.4, 2.0, 3.9, 4.2, 5.2, 5.5, 5.9(2), 6.2, 6.3, 6.7, 7.3, 9.7, 11, 13 mg/kg.

The Meeting noted that median residues in barley, oats and wheat hay and straw are within a 5-fold range. However, since the residue populations were significantly different according to the Kruskal-Wallis H-test between cereals, the Meeting decided to estimate a maximum residue level and median residue value based on the highest individual dataset for wheat hay (see JMPR Report 2013, 2.9).

Based on wheat hay, the Meeting estimated a highest residue of 13 mg/kg (as received), a median residue of 5.9 mg/kg (as received) and a maximum residue level of 25 mg/kg (DM, based on 88% DM content) for hay of barley, oat, rye, wheat, extrapolated to triticale.

Straw (barley, oats, rye, wheat)

The critical GAP for straw of wheat, oat, barley, rye and triticale in the USA allows two foliar applications of metconazole at 112 g ai/ha with no livestock feeding restrictions. The Meeting noted that the GAP for barley, oat, rye, triticale and wheat grains in the USA has a PHI of 30 days.

The ranked order of residues in barley straw approximating GAP was (n = 1): 2.6 mg/kg (3.1 mg/kg highest individual).

The ranked order of residues in oat straw approximating GAP was (n = 2): 1.0, 1.8, mg/kg (2.1 mg/kg highest individual).

The ranked order of residues in rye straw approximating GAP was (n = 3): 2.3, 5.0, 8.5 mg/kg (8.8 mg/kg highest individual).

The ranked order of residues in wheat straw approximating GAP was (n = 4): 0.42, 1.2, 2.3, 4.8 mg/kg (5.1 mg/kg highest individual).

The Meeting decided to combine the data sets for straw as they were considered similar. The ranked order of residues in straw following treatment approximating GAP for estimating maximum residue levels and livestock burden was (n = 10): 0.42, 1.0, 1.2, 1.8, 2.3(2), 2.6, 4.8, 5.0, 8.5 mg/kg (8.8 mg/kg highest individual residue).

The Meeting estimated a highest residue of 8.8 mg/kg (as received), a median residue of 2.3 mg/kg (as received) and a maximum residue level of 20 mg/kg (DM, based on 88% DM content) for straw of barley, oat, rye, wheat, extrapolated to triticale.

Maize forage

The critical GAP for maize forage in the USA allows four foliar applications of metconazole at 92 g ai/ha with a PHI of 7 days.

In field trials conducted with maize in the USA, the ranked order of residues in maize forage following GAP treatment (± 25) was (n = 25): 0.04, 0.09, 0.10(2), 0.11, 0.17, 0.19, 0.48, 0.52, 0.53, 0.80, 0.82, 0.91, 0.97, 1.1, 1.2(4), 1.3(2), 1.5, 1.8, 1.9, 2.7 mg/kg as received.

The Meeting estimated a highest residue of 2.7 mg/kg (as received) for metconazole in maize forage and a median residue of 0.91 mg/kg (as received).

Maize fodder

The critical GAP for maize fodder in the USA allows four foliar applications of metconazole at 92 g ai/ha with a PHI of 20 days.

In field trials conducted with maize in the USA, the ranked order of residues in maize fodder following GAP treatment (± 25) was (n = 20): 0.14, 0.94, 1.2, 1.4, 1.5(2), 1.6, 1.8(3), 1.9(2), 2.0(2), 2.1, 2.3, 2.5, 2.7(2), 3.2 mg/kg as received (3.5 mg/kg highest individual value).

The Meeting estimated a highest residue of 3.5 mg/kg (as received) for metconazole in maize fodder, a median residue of 1.85 mg/kg (as received) and a maximum residue level of 7 mg/kg (DM, based on 83% DM content)

Almond hulls

The critical GAP for almonds in the USA allows four outdoor foliar applications of metconazole at 123 g ai/ha with a PHI of 25 days, with no more than 2 sequential applications after petal fall before switching to an alternative fungicide.

No trials provided matched the GAPs. Hence, the Meeting concluded that no maximum residue level could be estimated for metconazole in almond hulls.

Rape seed forage

The critical GAP for oilseed rape in Chile allows two outdoor foliar applications of metconazole at 90 g ai/ha with a PHI of 42 days.

In field trials conducted with oilseed rape in France, the ranked order of residues in rape forage following GAP treatment (± 25) was (n = 7): 0.050, 0.060, 0.070, 0.090, 0.12, 0.13(2) mg/kg.

The Meeting estimated a highest residue of 0.13 mg/kg (as received) for metconazole in oilseed rape forage and a median residue of 0.09 mg/kg (as received).

Cotton gin by-products

The critical GAP for cotton seed in the USA allows three outdoor foliar applications of metconazole at 92 g ai/ha with a PHI of 30 days.

In field trials conducted with cotton in the USA, the ranked order of residues in cotton gin by-products following GAP treatment (± 25) was (n = 6): 0.17, 0.18, 2.5, 2.8, 3.7, 4.1 mg/kg (4.6 mg/kg highest individual value).

The Meeting estimated a highest residue of 4.6 mg/kg (as received) for metconazole in cotton gin by-products, a median residue of 2.65 mg/kg (as received) and a maximum residue level of 10 mg/kg (DM, based on 90% DM content).

FATE OF RESIDUES DURING PROCESSING

The Meeting received information on the hydrolysis of *cis*-enriched ^{14}C-labelled-metconazole, simulating typical processing conditions (pH 4,5 and 6 with 90 °C, 100 °C and 120 °C for 20, 60 and 20 minutes). No significant hydrolysis of metconazole was observed at the conditions studied.

The Meeting concluded that metconazole is stable under the conditions of pasteurisation, boiling, baking and brewing, as well as sterilisation.

The fate of metconazole residues has been examined simulating household and commercial processing of plums, soya bean, potato, sugar beet, barley, oat, maize, wheat, sugar cane, oilseed rape seed, cotton seed and peanut.

Table 2 Estimated processing factors for maximum residue and dietary exposure of processed commodities according to the residue definition *metconazole (sum of cis and trans isomer)*

Crop	Residue (mg/kg) in RAC			Processed commodity	Individual PF	Median or best estimate PF	Residue (mg/kg) in processed commodity		
	MRL	STMR	HR				MRL-P	STMR-P	HR-P
Plum	0.1	0.04	0.05	Prunes, dried	2.3	2.3	0.5	0.092	0.115
Soya bean	0.04	0.01	-	Refined oil	< 0.48, < 0.53, 0.69	0.53	-	0.005	-
Sugar beet	0.07	0.02	-	Sugar	0.5, < 0.6, 1.2	0.6	-	0.012	-
Sugar cane	0.06	0.021	0.036	Ref. sugar	< 0.10	< 0.10	-	0.002	-
				Molasses	1.3	1.3	0.08	0.027	-
Rape seed	0.15	0.02	--	Refined oil	1.5, 1.6, 1.6, 1.8	1.6	0.5	0.032	-
Cotton seed	0.3	0.035	-	Refined oil	0.12	0.12	-	0.004	-
Peanut	0.04(*)	0.04	-	Refined oil	1.4	1.4	0.06	0.056	-

RESIDUES IN ANIMAL COMMODITIES

Farm animal feeding studies

The Meeting received feeding studies involving metconazole on lactating cows and laying hens.

The study with lactating cows was conducted at treatment rates of 5, 15 and 50 ppm. In milk, skim milk and cream residues of *cis*- and *trans*-metconazole were <LOQ in the 50 ppm dose group throughout the study. Residues of parent metconazole were <LOQ (< 0.04 mg/kg) in muscle, fat, liver kidney, at the highest dose group. Metabolite M1 (free and conjugated) was quantified in the highest dosing group in kidney and liver at up to 0.02 mg/kg and 0.03 mg/kg, respectively. Additionally, metabolite M12 (free) was quantified only in kidney at the 15 ppm level at 0.02 mg/kg and at the 50 ppm level at 0.04 mg/kg.

The study with laying hens was conducted at treatment rates of 2, 6 and 20 ppm. While residues of parent metconazole in eggs were <LOQ in the lower dose groups, residues ranged between 0.043–0.062 mg/kg at the highest dose group. In tissues, no residues of parent metconazole were detected >LOQ in any dose group. Metabolite M1 (free and conjugated) was quantified in liver only at the 6 ppm level at 0.02 mg/kg and at the 20 ppm level at 0.04 mg/kg. Additionally, metabolite 1,2,4-triazole was quantified in eggs at the 20 ppm dose group ranging between 0.010–0.024 mg/kg as well as in muscle and liver at 0.028 mg/kg and at 0.029 mg/kg, respectively.

Estimated maximum and mean dietary burdens of livestock and animal commodities maximum residue levels

Dietary burden calculations for beef cattle, dairy cattle, broilers and laying poultry are presented in Annex 6. The calculations were made according to the livestock diets from US-Canada, EU, Australia and Japan in the OECD Table (Annex 6 of the 2006 JMPR Report).

Table 3 Estimated livestock dietary burden for *metconazole (sum of cis and trans isomer)*

Livestock dietary burden, ppm of dry matter diet								
	US-Canada		EU		Australia		Japan	
	max.	Mean	max.	mean	max.	Mean	max.	Mean
Beef cattle	2.5	1.2	8.6	3.2	15[a]	6.7[b]	0.010	0.010
Dairy cattle	6.2	2.8	7.9	2.5	15[a]	6.7[b]	3.8	1.4

Livestock dietary burden, ppm of dry matter diet								
	US-Canada		EU		Australia		Japan	
	max.	Mean	max.	mean	max.	Mean	max.	Mean
Poultry – broiler	0.040	0.040	0.028	0.028	0.046	0.046	0.008	0.008
Poultry – layer	0.040	0.040	2.2[c]	0.94[d]	0.046	0.046	0.009	0.009

[a] Highest maximum dietary burden for beef or dairy cattle; suitable for estimating the maximum residue levels for mammalian meat and milk

[b] Highest mean dietary burden for beef or dairy cattle; suitable for estimating STMRs for mammalian meat and milk

[c] Highest maximum dietary burden for broiler chickens or laying hens suitable for estimating maximum residue levels for poultry meat, fat, offal, and eggs

[d] Highest mean dietary burden for laying hens; suitable for estimating the STMRs for poultry meat, fat, offal, and eggs.

none no relevant feed items

Animal commodities maximum residue levels

For beef and dairy cattle, a maximum and mean dietary burden of 15 ppm and 6.7 ppm were estimated, respectively. The estimated dietary burdens are evaluated against a lactating cow feeding study involving administration of metconazole at 5, 15 and 50 ppm.

For maximum residue level estimation, the Meeting noted that even at the 50 ppm feeding level no residues of metconazole >LOQ were detected in milk and tissues and estimated maximum residues levels of 0.04(*) mg/kg for mammalian meat, milks, fat and edible offal (mammalian).

For STMR and HR estimations in milk and tissues, the mean and maximum dietary burdens of 6.7 ppm and 15 ppm, respectively, were evaluated against the residues in milk and tissues of the lactating cow feeding study at the 15 ppm dosing level. Levels in milk, muscle and fat (parent only measured) and liver and kidney (parent, metabolite M1 (free and conjugated) and M12 (free) measured) were < LOQ at 15 ppm (except for M12 in kidney found at 0.02 mg/kg at 15 ppm). Levels of metabolites M1 (free and conjugated) and M12 (free) in milk, muscle and fat in a goat metabolism study dosed at 24 ppm were < 0.01 mg/kg. Conjugated M12 was not found in the goat metabolism study.

The Meeting estimated STMR and HR values of 0 mg/kg in mammalian meat, milks and fat.

As residues of parent were <LOQ, even at the 50 ppm feeding level, the Meeting decided to set the value at 0 for estimating STMR and HR values in edible offal (mammalian). The Meeting estimated a STMR and HR of 0.037 mg/kg for edible offal (mammalian) based on kidney

For poultry, a maximum and mean dietary burden of 2.2 ppm and 0.94 ppm were estimated, respectively. The estimated dietary burdens are evaluated against a poultry feeding study involving administration of metconazole at 2, 6 and 20 ppm.

For a maximum residue level, the Meeting noted that even at the 20 ppm feeding level no residues of metconazole >LOQ were detected in eggs and poultry tissues and estimated maximum residues levels of 0.04(*) mg/kg in poultry meat, eggs, fat and edible offal.

For STMR and HR estimations in eggs and poultry tissues, the mean and maximum dietary burden of 0.94 ppm and 2.2 ppm were evaluated against the residues in eggs and tissues of the poultry feeding study at the 2 ppm and 6 ppm dosing level, respectively. Levels in eggs (parent only measured) were <LOQ at 2 and 6 ppm. Residues of metabolites M1 and M12 in eggs from a poultry metabolism study dosed at 14 ppm or 13 ppm, scaled to the mean dietary burden of 0.94 ppm were < 0.01 mg/kg. In tissues (parent, metabolite M1 (free and conjugated) and M12 (free) measured) were <LOQ at 2 and 6 ppm (except for M1 in liver found at 0.02 mg/kg at 6 ppm). . Since no conjugates of M12 were determined, residue levels could be underestimated for total free and conjugated M12 in poultry. However, considering the contribution of conjugated M12 (up to 64% of total M12) and that

residues of M12 (free) were <LOQ at even 20 ppm, no residues of M12 (conjugated) >LOQ are expected at the relevant dietary burden.

The Meeting estimated STMR and HR values of 0 mg/kg for poultry eggs, meat and fat.

As residues of parent and M12 in liver were <LOQ in all dose groups, the Meeting decided to set these values at 0 for estimating STMR and HR values in poultry edible offal. The Meeting estimated a STMR of 0.019 mg/kg and a HR of 0.020 mg/kg in poultry edible offal.

RECOMMENDATIONS

On the basis of the data obtained from supervised trials, the Meeting concluded that the residue levels listed below 1 are suitable for establishing maximum residue limits and for IEDI and IESTI assessments

Definition of the residue for compliance with the MRL for plant and animal commodities: *Metconazole (sum of cis and trans isomer)*

Definition of the residue for dietary risk assessment for plant commodities: *Metconazole (sum of cis and trans isomer)*

Definition of the residue for dietary risk assessment for animal commodities: *Sum of metconazole (cis and trans-isomer) and metabolites (1SR,2SR,5RS)-5-(4-chlorobenzyl)-2-(hydroxymethyl)-2-methyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol (M1; free and conjugated) and (1RS,2SR,3RS)-3-(4-chlorobenzyl)-2-hydroxy-1-methyl-2-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanecarboxylic acid (M12; free and conjugated), expressed as metconazole*

The residue is not fat-soluble.

Table 4 Maximum residue levels and dietary exposure

Commodity		Recommended maximum residue level, mg/kg		STMR or STMR-P, mg/kg	HR or highest residue, mg/kg
CCN	Name	New	Previous		
FI 0327	Banana	0.1(*)		0.1	0.1
FB 0020	Blueberries	0.5		0.14	0.33
VP 0061	Beans with pods (Phaseolus spp.) immature pods and succulent seeds)	0.05(*)		0	0
SO 0691	Cotton seed	0.3		0.0345	
MO 0105	Edible offal (mammalian)	0.04(*)		0.037	0.037
PE 0112	Eggs	0.04(*)		0	
VA 0381	Garlic	0.05(*)		0.05	0.05
TN 0085	Group of tree nuts	0.04(*)		0	0
GC 0645	Maize	0.015		0.01	
MF 0100	Mammalian fats (except milk fats)	0.04(*)		0	0
MM 0095	Meat (from mammals other than marine mammals)	0.04(*)		0	0
ML 0106	Milks	0.04(*)		0	0
VA 0385	Onion, bulb	0.05(*)		0.05	0.05
SO 0697	Peanut	0.04(*)		0.04	
PO 0111	Poultry, Edible offal of	0.04(*)		0.019	0.020
PF 0111	Poultry fats	0.04(*)		0	0
PM 0110	Poultry meat	0.04(*)		0	0
SO 0495	Rape seed	0.15		0.02	

Commodity		Recommended maximum residue level, mg/kg		STMR or STMR-P, mg/kg	HR or highest residue, mg/kg
CCN	Name	New	Previous		
FS 0013	Subgroup of cherries	0.3		0.07	00.16
VD 2065	Subgroup of dry beans except soya beans	0.04(*)		0.04	
VD 2066	Subgroup of dry peas	0.15		0.0425	
FS 2001	Subgroup of peaches	0.2		0.045	0.09
FS 0014	Subgroup of plums	0.1		0.040	0.05
SO 2091	Subgroup of sunflower seeds	1.5		0.089	
VR 2071	Subgroup of tuberous and corm vegetables	0.04(*)		0	0
VR 0596	Sugar beet	0.07		0.02	
VD 0541	Soya beans	0.04		0.01	
GS 0659	Sugar cane	0.06		0.0205	0.036
GC 0447	Sweet corn (Corn-on–the-cob)	0.015(*)		0.01	0.01
DF 0014	Prunes, dried	0.5		0.092	0.115
OR 0541	Soya bean oil, refined	-		0.005	
	Sugar, sugar beet	-		0.012	
	Sugar cane, refined sugar	-		0.002	
DM 0659	Sugar cane, molasses	0.08		0.027	
OR 0495	Rape seed oil, Edible	0.5		0.032	
OR 0691	Cotton seed oil, Edible	-		0.004	
OR 0697	Peanut oil, Edible	0.06		0.056	

Table 5 Feed items

Commodity		Recommended maximum residue level, mg/kg		STMR or STMR-P or median mg/kg	HR or highest residue, mg/kg
AS 0640	Barley straw and fodder, dry	25 (dw)		Median: 5.9 (ar) (hay), 2.3 (ar) (straw)	Highest: 13 (ar) (hay), 8.8 (ar) (straw)
AS 0647	Oat straw and fodder, dry	25 (dw)		Median: 5.9 (ar) (hay), 2.3 (ar) (straw)	Highest: 13 (ar) (hay), 8.8 (ar) (straw)
AS 0650	Rye straw and fodder, dry	25 (dw)		Median: 5.9 (ar) (hay), 2.3 (ar) (straw)	Highest: 13 (ar) (hay), 8.8 (ar) (straw)
AS 0653	Triticale straw and fodder, dry	25 (dw)		Median: 5.9 (ar) (hay), 2.3 (ar) (straw)	Highest: 13 (ar) (hay), 8.8 (ar) (straw)
AS 0654	Wheat straw and fodder, dry	25 (dw)		Median: 5.9 (ar) (hay), 2.3 (ar) (straw)	Highest: 13 (ar) (hay), 8.8 (ar) (straw)
	Cotton gin by-products	10 dw		2.65 ar	4.6 ar
	Maize fodder	7 dw		1.85 ar	3.5 ar
	Maize forage	-		0.91	2.7
	Rape seed forage	-		0.09	0.13
	Soya bean forage	-		1.0	1.92
	Soya bean hay	8 dw		1.7 ar	3.2 ar
	Sugar beet tops			0.15	1.2

DIETARY RISK ASSESSMENT

Long-term dietary exposure

The ADI for metconazole is 0–0.04 mg/kg bw. The International Estimated Daily Intakes (IEDIs) for metconazole were estimated for the 17 GEMS/Food Consumption Cluster Diets using the STMR or STMR-P values estimated by the JMPR. The results are shown in Annex 3 of the 2019 JMPR Report.

The IEDIs ranged from 0–2% of the maximum ADI. The Meeting concluded that long-term dietary exposure to residues of metconazole from uses considered by the JMPR is unlikely to present a public health concern.

Acute dietary exposure

The ARfD for metconazole is 0.04 mg/kg bw. The International Estimate of Short Term Intakes (IESTIs) for metconazole were calculated for the food commodities and their processed commodities for which HRs/HR-Ps or STMRs/STMR-Ps were estimated by the present Meeting and for which consumption data were available. The results are shown in Annex 4 of the 2019 JMPR Report.

The IESTIs varied from 0–20% of the ARfD for children and 0–10% of the ARfD for the general population. The Meeting concluded that acute dietary exposure to residues of metconazole from uses considered by the present Meeting is unlikely to present a public health concern.

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METCON_027	Edwards V.T.	1991 b	[Cyclopentyl–^{14}C] WL148271(KNF-S–474m): Metabolism in wheat Shell Research Ltd., Sittingbourne Kent ME9 8AG, United Kingdom MK–640-002 GLP: yes Unpublished
METCON_028	Kao M.L.	1997 a	CL 900768 (Metconazole): Metabolism of [triazole–3,5–^{14}C] CL 900768 in canola under field conditions American Cyanamid Co., Princeton NJ, United States of America MK–640-006 GLP: yes Unpublished
METCON_029	Kao M.L.	1997 b	CL 900768 (Metconazole): Metabolism of [p-chlorophenyl-U–14C] CL 900768 in canola under field conditions American Cyanamid Co., Princeton NJ, United States of America MK–640-007 GLP: yes Unpublished
METCON_030	Kao L.M.	1998	CL 900768 (Metconazole): Metabolism of CL 900768 in banana under greenhouse conditions American Cyanamid Co., Princeton NJ, United States of America MK–640-008 GLP: yes Unpublished
METCON_031	Satoh K.	2002	Metabolic fate of KNF–474m in mandarins The Institute of Environmental Toxicology, Mitsukaido-shi Ibaraki 303-0043, Japan 2002/1028917 GLP: yes Unpublished

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METCON_032	Class T., Schluter H.	2002	Metconazole (BAS 555 F: AC 900768): Metabolism of carbon–14 labeled AC 900768 in peas PTRL Europe GmbH, Ulm, Germany Fed.Rep. 2002/5003836 GLP: yes Unpublished
METCON_033	Johnston A.M. *et al*.	1992 a	The disposition of [14C]-WL148271 (KNF-S–474m) in the lactating goat (nature of residue study to EPA guidelines) Inveresk Research International Ltd., Tranent East Lothian EH33 2NE, United Kingdom MK–440-013 GLP: yes Unpublished
METCON_034	Richardson K.A.	1993	[Cyclopentyl–^{14}C]-WL136184 (Metconazole, KNF-S–474c): Fate of WL136184 in the lactating goat following 5 consecutive daily doses (23 mg/day) Shell Research Ltd., Sittingbourne Kent ME9 8AG, United Kingdom MK–440-015 GLP: yes Unpublished
METCON_035	Jalal M.A.F	2006 a	Metconazole (KNF-S–474m): Metabolism by lactation goats Valent Technical Center, Dublin CA, United States of America 2006/1046074 GLP: yes Unpublished
METCON_036	Johnston A.M. *et al*.	1992 b	The disposition of [14C]-WL136184 (KNF-S–474c) in the laying hen (nature of residue study to EPA guidelines) Inveresk Research International Ltd., Tranent East Lothian EH33 2NE, United Kingdom MK–440-011 GLP: yes Unpublished
METCON_037	Johnston A.M. *et al*.	1992 c	The disposition of (14C)-WL136184 (KNF-S–474c) in the laying hen (nature of residue study to EPA guidelines) Inveresk Research International Ltd., Tranent East Lothian EH33 2NE, United Kingdom MK–440-012 GLP: yes Unpublished
METCON_038	Jalal M.A.F	2006 b	Metconazole (KNF-S–474m): Metabolism by laying hens Valent Technical Center, Dublin CA, United States of America 2006/1046073 GLP: yes Unpublished
METCON_039	Gedik L., Fullard D.C.	2002	Metconazole (BAS 555 F): Degradation in soil under aerobic conditions Inveresk Research, Tranent East Lothian EH33 2NE, United Kingdom MK–620-020 GLP: yes Unpublished
METCON_040	Dalkmann P., Kibat H.	2015	Soil metabolism of Metconazole (BAS 555 F) under aerobic conditions BASF SE, Limburgerhof, Germany Fed.Rep. 2014/1000901 GLP: yes Unpublished

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METCON_041	Baranowski D., VanDijk A.	1992	Photodegradation study of 14C-WL 136184 on soil RCC Umweltchemie AG, Itingen, Switzerland MK–620-005 GLP: yes Unpublished
METCON_042	Bissinger H.J.	1996	Photochemical degradation of Metconazole (CL900768) in soil Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–620-013 GLP: yes Unpublished
METCON_043	Knight L.	2015	Metconazole (BAS 555 F): Soil photolysis Huntingdon Life Sciences Ltd., Huntingdon Cambridgeshire PE28 4HS, United Kingdom 2014/1000923 GLP: yes Unpublished
METCON_044	Hill A.D., Standen M.E.	1993	Metconazole: Confined rotational crop study using [cyclopentyl–^{14}C] and [triazole–^{14}C]- WL148271 Shell Research Ltd., Sittingbourne Kent ME9 8AG, United Kingdom MK–640-004 GLP: yes Unpublished
METCON_045	Memmesheimer H.	1996	Metconazole (CL 900768) 60 g ai/l SL (SF09381): Determination of CL 900768 residues in following crops (Germany, 1995) Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–790-010 GLP: yes Unpublished
METCON_046	Memmesheimer H.	1996	Metconazole (CL900768): Validation of method FAMS 050-01 for the determination of residues in cereals (Germany, 1995) Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–244-010 GLP: no Unpublished
METCON_047	Memmesheimer H.	1996	Metconazole (CL 900768): Analytical method FAMS 050-01 for the determination of CL 900768 residues as cis- (CL354801) and trans-isomer (CL 354802) in cereals-Additional validation data Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–244-026 GLP: no Unpublished
METCON_048	Weeren R.D.	1996	Validation of Cyanamid analytical method FAMS 050-01 for the determination of residues of Metconazole in cereals Dr. Specht & Partner Chemische Laboratorien GmbH, Hamburg, Germany Fed.Rep. MK–244-016 GLP: yes Unpublished
METCON_049	Memmesheimer H.	1996	Metconazole (CL900768): Validation of method FAMS 059-01 for the determination of residues as cis-(CL354801) and trans-(CL354802) isomer in oil seed rape and rape oil (Germany, 1995) Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–244-014 GLP: yes Unpublished

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METCON_050	Memmesheimer H.	1997	Metconazole (CL 900768): Validation of method FAMS 059-02 for the determination of CL 900768 residues as cis-(CL 354801) or trans-(CL354802) isomer in oilseed rape (Germany, 1996) Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–244-019 GLP: yes Unpublished
METCON_051	Memmesheimer H.	1999	Metconazole (CL 900768): Analytical method FAMS 059-02 for the determination of CL 900768 residues as cis- (CL 354801) and trans-isomer (CL 354802) in oil seed rape-Additional validation data Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–244-025 GLP: no Unpublished
METCON_052	Memmesheimer H.	1997	Analysemethode FAMS 069-01: Metconazole (CL 900768): Methode zur Bestimmung des Wirkstoffes als cis (CL 354801)- und trans (CL 354802) -Isomer in Erbsen und Erbsenstroh Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–244-021 GLP: no Unpublished
METCON_053	Memmesheimer H.	1997	Metconazole (CL 900768): Validation of method FAMS 069-01 for the determination of CL 900768 residues as cis-(CL 354801) and trans-(CL 354802) isomer in pea seed and pea straw (Germany, 1997) Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–244-020 GLP: yes Unpublished
METCON_054	Memmesheimer H.	1999	Metconazole (CL 900768): Analytical method FAMS 069-01 for the determination of CL 900768 residues as cis-(CL 354801) and trans-isomer (CL 354802) in pea seeds and pea straw-Additional validation data Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–244-027 GLP: no Unpublished
METCON_055	Khunachak A. *et al*.	1998	CL 900,768 (Metconazole): GC/NP determinative and GC/MS confirmatory methods for the determination of CL 354,801 (cis-isomer) and CL 354,802 (trans-isomer) residues in whole banana and banana pulp American Cyanamid Co., Princeton NJ, United States of America MK–244-022 GLP: no Unpublished
METCON_056	Sweeney R.A., Khunachak A.	1998	CL 900768 (Metconazole): Verification of the extraction efficiency and accountability of American Cyanamid Company method M 2722 used for the determination of CL 354801 (cis-isomer) and CL 354802 (trans-isomer) residues in whole banana and banana pulp American Cyanamid Co., Princeton NJ, United States of America MK–244-024 GLP: no Unpublished
METCON_057	Lehmann A., Mackenroth C.	2004	Validation of the analytical method 550/0 in various plant matrices BASF AG, Limburgerhof, Germany Fed.Rep. 2004/1010555 GLP: yes Unpublished

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METCON_058	Perny A.	2004	Study on the residue behaviour of Metconazole in spring barley after application of BAS 555 00 F under field conditions in France, in 2003 Anadiag SA, Haguenau, France 2004/1000755 GLP: yes Unpublished
METCON_059	Perny A.	2004	Report amendment No. 1 to final report: Study code 159427 Anadiag SA, Haguenau, France 2004/1006466 GLP: yes Unpublished
METCON_060	Fujie G.H.	2006	RM–41C–1–1-Determination of cis-Metconazole and trans-Metconazole in crops Valent Technical Center, Dublin CA, United States of America 2006/1051358 GLP: no Unpublished
METCON_061	Thompson D.C.	2010	Metconazole (V10116): Magnitude of the residue on blueberry United States Department of Agriculture ARS SAA, Tifton GA, United States of America 2010/1232553 GLP: yes Unpublished
METCON_062	Corley J.	2013	Metconazole: Magnitude of the residue on bean (dry) JRF America, Audubon PA, United States of America 2013/1418322 GLP: yes Unpublished
METCON_063	Green C.A.	2010	Magnitude of the residues of Metconazole on dry peas Valent Technical Center, Dublin CA, United States of America 2010/1232555 GLP: yes Unpublished
METCON_064	Corley J.	2013	Metconazole: Magnitude of the residue on pea (dry) JRF America, Audubon PA, United States of America 2013/1418321 GLP: yes Unpublished
METCON_065	Corley J.	2013	Metconazole: Magnitude of the residue on sunflower JRF America, Audubon PA, United States of America 2013/1418320 GLP: yes Unpublished
METCON_066	Green C.A.	2010	Magnitude of the residues of Metconazole on dry beans Valent Technical Center, Dublin CA, United States of America 2010/1232554 GLP: yes Unpublished

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METCON_067	Sweeney R.A., Khunachak A.	1998	Independent laboratory validation of GC/NP determinative method M 2722 for the determination of CL 354,801 (cis-isomer) and CL 354,802 (trans-isomer) of Metconazole (CL 900,768) residues in whole bananas and banana pulp American Cyanamid Co., Princeton NJ, United States of America MK–244-023 GLP: yes Unpublished
METCON_068	Kwasniok A., Pelz S.	1997	Independent laboratory validation (ILV) of Cyanamid analytical method FAMS 059-02 for the determination of residues of Metconazole (CL 900768) in oilseed rape Dr. Specht & Partner Chemische Laboratorien GmbH, Hamburg, Germany Fed.Rep. MK–244-018 GLP: yes Unpublished
METCON_069	Noon P.	2006	Independent laboratory validation of the analytical method RM–41C–1, determination of cis-Metconazole and trans-Metconazole in crops North Coast Laboratories Ltd., Arcata CA, United States of America 2006/1051357 GLP: yes Unpublished
METCON_070	Class T.	1999	Metconazole (CL 900768): Assessment and validation of the multi-residue enforcement method DFG S19 with modified extraction for determination of residues in plant material and in foodstuff of animal origin PTRL Europe GmbH, Ulm, Germany Fed.Rep. MK–240-002 GLP: yes Unpublished
METCON_071	Class T.	2003	Assessment and validation of the multi-residue enforcement method DFG S19 with modified extraction for the determination of residues of Metconazole in plant material and in foodstuff of animal origin PTRL Europe GmbH, Ulm, Germany Fed.Rep. 2003/1016623 GLP: yes Unpublished
METCON_072	Tillkes M.	1996	Validation of DFG method S19 (modified extraction) for the determination of the residues of Metconazole in cereals Dr. Specht & Partner Chemische Laboratorien GmbH, Hamburg, Germany Fed.Rep. MK–244-017 GLP: no Unpublished
METCON_073	Kuhn T.	2014	Metconazole: Validation of the multi-residue enforcement method DFG S19 for the determination of residues in wheat grain, grape, peas, oilseed rape seed and apple using LC/MS/MS PTRL Europe, Ulm, Germany Fed.Rep. 2014/1028662 GLP: yes Unpublished
METCON_074	Richter S.	2014	Report amendment No. 1-Metconazole: Validation of the multi-residue enforcement method DFG S19 for the determination of residues in wheat grain, grape, peas, oilseed rape seed and apple, using LC/MS/MS PTRL Europe, Ulm, Germany Fed.Rep. 2014/1263163 GLP: yes

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			Unpublished
METCON_075	Schemikau N., Colorado C.	2015	Metconazole: Independent laboratory validation of the BASF method L0259/01 multi residue enforcement method DFG S19 for the determination of residues in wheat grain, grape, peas, oilseed rape seed and apple, using LC/MS/MS Eurofins Agroscience Services Chem GmbH, Hamburg, Germany Fed.Rep. 2014/7000243 GLP: yes Unpublished
METCON_076	Dantas C.	2005	Estudo de validacao do POP-PA.0223 para determinacao de resíduos de Metconazole em soja (grao) LARAL-Laboratorio Agro de Residuos da America Latina, Rio de Janeiro, Brazil 2005/3000400 GLP: yes Unpublished
METCON_077	Saha M.G.	2007	Method validation of BASF analytical method D0604 Entitled: The determination of residues of BAS 555 F and its metabolites in corn and cotton matrices using LC/MS/MS BASF Agro Research RTP, Research Triangle Park NC, United States of America 2006/7011129 GLP: yes Unpublished
METCON_078	Class T.	2011	Modification M004 of BCS residue analytical method 01062 for the determination of 1,2,4-Triazole, Triazolyl alanine, Triazolyl acetic acid and Triazole lactic acid by LC/DMS/MS/MS in plant materials PTRL Europe GmbH, Ulm, Germany Fed.Rep. 2012/1294644 GLP: yes Unpublished
METCON_079	Mackenroth C., Lehmann A.	2007	Validation of BASF method No. 535/1 in plant matrices BASF AG, Limburgerhof, Germany Fed.Rep. 2006/1039427 GLP: yes Unpublished
METCON_080	Green C.A.	2007	Magnitude of the residues of Metconazole in/on canola and canola processing fractions Valent U.S.A. Corp.-Valent Technical Center, Dublin CA, United States of America 2007/1073345 GLP: yes Unpublished
METCON_081	Dantas C.	2005	Estudo de validacao do POP-PA.0206 para determinacao de residuos de Metconazole em alho (bulbo total) e cebola (bulbo total) BASF SA, Resende, Brazil 2005/3000387 GLP: yes Unpublished

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METCON_082	Weeren R.D., Pelz S.	1999	Metconazole (CL 900768): Validation of DFG method S 19 for the determination of residues of Metconazole (CL 900768) as cis- (CL 354801) and trans-isomer (CL 354802) in plant material, foodstuff of animal origin and soil Dr. Specht & Partner Chemische Laboratorien GmbH, Hamburg, Germany Fed.Rep. MK–240-003 GLP: yes Unpublished
METCON_083	Green C.A.	2006	Magnitude of the residues of Metconazole in dairy cattle and meat Valent Technical Center, Dublin CA, United States of America 2006/1046033 GLP: yes Unpublished
METCON_084	Kuhn T.	2010	Metconazole: Validation of the multi-residue enforcement method DFG S19 for the determination of residues in liver and kidney, using LC/MS/MS PTRL Europe GmbH, Ulm, Germany Fed.Rep. 2010/1080270 GLP: yes Unpublished
METCON_085	Toledo F.	2010	Determination of Metconazole (BAS 555 F) in animal matrices-Independent laboratory validation SGS Institut Fresenius GmbH, Taunusstein, Germany Fed. Rep. 2010/1144332 GLP: yes Unpublished
METCON_086	Kuhn T.	2014	Metconazole: Validation of the multi-residue enforcement method DFG S19 for the determination of residues in milk, egg, meat and fat, using LC/MS/MS PTRL Europe, Ulm, Germany Fed.Rep. 2013/1349767 GLP: yes Unpublished
METCON_087	Schemikau N., Colorado C.	2015	Metconazole: Independent laboratory validation of the multi-residue enforcement method DFG S19 for the determination of residues in milk, egg, meat and fat, using LC/MS/MS Eurofins Agroscience Services Chem GmbH, Hamburg, Germany Fed.Rep. 2014/7000242 GLP: yes Unpublished
METCON_088	Green C.A.	2008	Magnitude of the residues of Metconazole in chicken eggs and tissues Valent U.S.A. Corp.-Valent Technical Center, Dublin CA, United States of America 2008/8000061 GLP: yes Unpublished
METCON_089	Andre M., Stahl F.	2018	Validation of analytical method L0408/01 (RM–41M–1) for the determination of cis- and trans-BAS 555 F (Metconazole) in milk and cream SGS Institut Fresenius GmbH, Taunusstein, Germany Fed. Rep. 2018/1099559 GLP: yes Unpublished

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METCON_090	Poperechna N.	2018	Validation of analytical method L0408/02 (RM–41M–2) for the determination of cis- and trans- BAS 555 F (Metconazole) in animal tissues SGS Institut Fresenius GmbH, Taunusstein, Germany Fed. Rep. 2018/1099560 GLP: yes Unpublished
METCON_091	Stahl F.	2018	Amendment 1: Validation of analytical method L0408/02 (RM–41M–2) for the determination of cis- and trans- BAS 555 F (Metconazole) in animal tissues SGS Institut Fresenius GmbH, Taunusstein, Germany Fed. Rep. 2018/1222770 GLP: yes Unpublished
METCON_092	Bitter J.	2018	Metconazole: Validation of Valents method RM–41M–3a, determination of Metconazole metabolites M–1 and M–12 in animal matrices Valent Technical Center, Dublin CA, United States of America 2018/1203739 GLP: yes Unpublished
METCON_093	Jooss S., Tussetschlaeger S.	2018	Validation of BASF analytical method L0415/01 for the determination of 1.2.4 Triazole in animal matrices EAG Laboratories GmbH, Ulm, Germany Fed.Rep. 2018/1172561 GLP: yes Unpublished
METCON_094	Memmesheimer H.	1997	Metconazole (CL 900768): Storage stability of CL 900768 residues of cis-(CL 354801) and trans-(CL 354802) isomer at less than or equal to -18 °C in cereal grain (Germany, 1995) Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–326-004 GLP: yes Unpublished
METCON_095	Memmesheimer H.	1997	Metconazole (CL 900768): Storage stability of CL 900768 residues as cis-(CL 354801) and trans-(CL 354802) isomer at less than or equal to -18 degrees C in cereal green plant and straw (Germany, 1996) Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–326-005 GLP: yes Unpublished
METCON_096	Memmesheimer H.	1997	Metconazole (CL 900768): Storage stability of CL 900768 residues as cis-(CL 354801) and trans-(CL 354802) isomer at less than or equal to-18 degrees C in rape seed and rape oil (Germany, 1996) Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–326-007 GLP: yes Unpublished
METCON_097	Memmesheimer H.	1997	Metconazole (CL 900768): Storage stability of CL 900768 residues as cis-(CL 354801) and trans-(CL 354802) isomer at less than or equal to -18 °C in carrots and lettuce (Germany, 1996) Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–326-006 GLP: yes Unpublished

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METCON_098	Mueller U.	1998	Metconazole (CL 900768): Storage stability of CL 900768 residues as cis-(CL 354801) and trans-(CL 354802) isomer at less than -18 degrees C in pea seeds and straw (Germany, 1997) Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–326-011 GLP: yes Unpublished
METCON_099	Gooding R., Saha M.	2008	Freezer storage stability of BAS 555 F (Metconazole) and its metabolites in plant samples BASF Agro Research RTP, Research Triangle Park NC, United States of America 2008/7019330 GLP: yes Unpublished
METCON_100	Thompson D.C.	2010	Metconazole (V10116): Magnitude of the residue on blueberry United States Department of Agriculture ARS SAA, Tifton GA, United States of America 2010/1232553 GLP: yes Unpublished
METCON_101	Corley J.	2010	Metconazole: Magnitude of the residue on potato United States Department of Agriculture ARS SAA, Tifton GA, United States of America 2010/1232552 GLP: yes Unpublished
METCON_102	Green C.A.	2010	Magnitude of the residues of Metconazole on dry peas Valent Technical Center, Dublin CA, United States of America 2010/1232555 GLP: yes Unpublished
METCON_103	Corley J.	2013	Metconazole: Magnitude of the residue on pea (dry) JRF America, Audubon PA, United States of America 2013/1418321 GLP: yes Unpublished
METCON_104	Green C.A.	2006	Magnitude of the residues of Metconazole in dairy cattle and meat Valent Technical Center, Dublin CA, United States of America 2006/1046033 GLP: yes Unpublished
METCON_105	Green C.A.	2006	Magnitude of the residues of Metconazole on peaches Valent Technical Center, Dublin CA, United States of America 2006/1052077 GLP: yes Unpublished
METCON_106	Green C.A.	2006	Magnitude of the residues of Metconazole on plums and dried plums Valent Technical Center, Dublin CA, United States of America 2006/1052075 GLP: yes Unpublished

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METCON_107	Green C.A.	2006	Magnitude of the residues of Metconazole on cherries Valent Technical Center, Dublin CA, United States of America 2006/1052076 GLP: yes Unpublished
METCON_108	Kleiner A.	1998	CL 900768 (Metconazole): CL 900768 residues in bananas after multiple treatments with Metconazole 200EC fungicide from a crop residue study conducted in Mexico American Cyanamid Co., Princeton NJ, United States of America MK–714-001 GLP: yes Unpublished
METCON_109	Kleiner A.	1998	CL 900768 (Metconazole): CL 900768 residues in bananas after multiple treatments with Metconazole 200EC fungicide from a crop residue study conducted in Mexico American Cyanamid Co., Princeton NJ, United States of America MK–714-002 GLP: yes Unpublished
METCON_110	Kleiner A.	1998	CL 900768 (Metconazole): CL 900768 residues in bananas after multiple treatments with Metconazole 200EC fungicide from a crop residue study conducted in Mexico American Cyanamid Co., Princeton NJ, United States of America MK–714-003 GLP: yes Unpublished
METCON_111	Garrett A.	1998	CL 900768 (Metconazole): CL 900768 residues in bananas after multiple treatments with Metconazole 200EC fungicide from a crop residue study conducted in Ecuador American Cyanamid Co., Princeton NJ, United States of America MK–714-004 GLP: yes Unpublished
METCON_112	Garrett A.	1998	CL 900768 (Metconazole): CL 900768 residues in bananas after multiple treatments with Metconazole 90EC fungicide from a crop residue study conducted in Honduras American Cyanamid Co., Princeton NJ, United States of America MK–714-005 GLP: yes Unpublished
METCON_113	Garrett A.	1998	CL 900768 (Metconazole): CL 900768 residues in bananas after multiple treatments with Metconazole 200EC fungicide from a crop residue study conducted in Ecuador American Cyanamid Co., Princeton NJ, United States of America MK–714-006 GLP: yes Unpublished
METCON_114	Garrett A.	1998	CL 900768 (Metconazole): CL 900768 residues in bananas after multiple treatments with Metconazole 90EC fungicide from a crop residue study conducted in Honduras American Cyanamid Co., Princeton NJ, United States of America MK–714-007 GLP: yes Unpublished
METCON_115	Garrett A.	1998	CL 900768 (Metconazole): CL 900768 residues in bananas after multiple treatments with Metconazole 90EC fungicide from a crop residue study conducted in Honduras American Cyanamid Co., Princeton NJ, United States of America MK–714-008 GLP: yes

Code	Author	Year	Title, Institute, Report reference
			Unpublished
METCON_116	Garrett A.	1998	CL 900768 (Metconazole): CL 900768 residues in bananas after multiple treatments with Metconazole 200EC fungicide from a crop residue study conducted in Ecuador American Cyanamid Co., Princeton NJ, United States of America MK–714-009 GLP: yes Unpublished
METCON_117	Kleiner A.	1998	CL 900768 (Metconazole): CL 900768 residues in bananas after multiple treatments with Metconazole 200EC fungicide from a crop residue study conducted in Costa Rica American Cyanamid Co., Princeton NJ, United States of America MK–714-010 GLP: yes Unpublished
METCON_118	Kleiner A.	1998	CL 900768 (Metconazole): CL 900768 residues in bananas after multiple treatments with Metconazole 200EC fungicide from a crop residue study conducted in Costa Rica American Cyanamid Co., Princeton NJ, United States of America MK–714-011 GLP: yes Unpublished
METCON_119	Kleiner A.	1998	CL 900768 (Metconazole): CL 900768 residues in bananas after multiple treatments with Metconazole 200EC fungicide from a crop residue study conducted in Costa Rica American Cyanamid Co., Princeton NJ, United States of America MK–714-012 GLP: yes Unpublished
METCON_120	Baptista G.C.	1998	Analise de residuos de Caramba 90 em cebola ESALQ-Escola Superior de Agricultura Luis de Queiroz, Sao Paulo, Brazil 1998/3000726 GLP: yes Unpublished
METCON_121	Baptista G.C.	1998	Analysis of residues of Caramba 90 in onions English translation of 1998/3000726 (5.4/1) 1998/1010995 GLP: yes Unpublished
METCON_122	Steling C.	2000	Determinacao de residuo de Metconazole (CL 900,768) em cebola do Brasil Cyanamid Quimica do Brasil Ltda., Paulinia, Brazil 2000/3000660 GLP: yes Unpublished
METCON_123	Steling C.	2000	Determination of Metconazole residues (CL 900,768) in onions from Brazil English translation of 2000/3000660 (5.4/2) 2000/1024653 GLP: yes Unpublished

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METCON_124	Steling C.	2000	Determinacao de residuos de Metconazole (CL 900, 768) LAADL-Latin America Agricultural Development Laboratory, Rio de Janeiro, Brazil 2000/3000737 GLP: yes Unpublished
METCON_125	Steling C.	2000	Determination of Metconazole residues (CL 900768) in onions from Brazil English translation of 2000/3000737 (5.4/3) 2000/1024654 GLP: yes Unpublished
METCON_126	Dantas C.	2006	Estudos de residuos de Metconazole em cebola (bulbo total) apos tratamento com Caramba 90 (BAS 555 01 F) no Brasil LARAL-Laboratorio Agro de Residuos da America Latina, Resende, Brazil 2006/3000666 GLP: yes Unpublished
METCON_127	Dantas C.	2006	Study of Metconazole residues in onions (total bulb) after treatment with Caramba 90 (BAS 555 01 F) in Brazil English translation of 2006/3000666 (5.4/4) 2006/1053713 GLP: yes Unpublished
METCON_128	Baptista C.G. de	1999	Analise de residuos de Caramba 90 em Alho ESALQ-Escola Superior de Agricultura Luis de Queiroz, Sao Paulo, Brazil 1999/3000525 GLP: yes Unpublished
METCON_129	Baptista C.G. de	1999	BAS 555 01 F: Analysis of residues of Caramba 90 in garlic, Brasil English translation of 1999/3000525 (5.4/5) 1999/1015377 GLP: yes Unpublished
METCON_130	Steling C.	2000	Relatorio de estudo de residuo de Metconazole (CL 900,768) em alho (bulbo total) do Brasil (Curva de Degradacao) Cyanamid Quimica do Brasil Ltda., Paulinia, Brazil 2000/3000672 GLP: yes Unpublished
METCON_131	Steling C.	2000	Study report of residue of Metconazole (CL 900768) in garlic (total bulb) from Brazil (degradation curve) English translation of 2000/3000672 (5.4/6) 2000/1024649 GLP: yes Unpublished
METCON_132	Steling C.	2000	Relatorio de estudo de residuo de Metconazole (CL 900,768) em alho (bulbo total) do Brasil Cyanamid Quimica do Brasil Ltda., Rio de Janeiro, Brazil 2000/3000683 GLP: yes Unpublished
METCON_133	Steling C.	2000	Metconazole residue study report (CL 900 768) in garlic (total bulb) from Brazil English translation of 2000/3000683 (5.4/7) 2000/1024650 GLP: yes Unpublished

Code	Author	Year	Title, Institute, Report reference
METCON_134	Dantas C.	2005	Estudos de residuos de Metconazole em alho (bulbo total) apos tratamento com Caramba 90 (BAS 555 01 F) no Brasil LARAL-Laboratorio Agro de Residuos da America Latina, Resende, Brazil 2005/3000331 GLP: yes Unpublished
METCON_135	Dantas C.	2005	Study of Metconazole residues in garlic (total bulb) after treatment with Caramba 90 (BAS 555 01 F) in Brazil English translation of 2005/3000331 (5.4/8) 2005/1046040 GLP: yes Unpublished
METCON_136	Baptista G.C. de	1999	Analise de residuos de Caramba 90 em vagem ESALQ-Escola Superior de Agricultura Luis de Queiroz, Sao Paulo, Brazil 1999/3000524 GLP: no Unpublished
METCON_137	Baptista G.C. de	1999	Residue analysis of Caramba 90 in green bean pods English translation of 1999/3000524 (5.5/1) 2018/3003649 GLP: no Unpublished
METCON_138	Dantas C.	2004	Estudo de resíduo de Metconazole em feijao (vagem) após tratamento com Caramba 90 (BAS 555 01 F) no Brasil LARAL-Laboratorio Agro de Residuos da America Latina, Resende, Brazil 2004/3000236 GLP: yes Unpublished
METCON_139	Green C.A.	2010	Magnitude of the residues of Metconazole on dry beans Valent Technical Center, Dublin CA, United States of America 2010/1232554 GLP: yes Unpublished
METCON_140	Corley J.	2013	Metconazole: Magnitude of the residue on bean (dry) JRF America, Audubon PA, United States of America 2013/1418322 GLP: yes Unpublished
METCON_141	Green C.A.	2010	Magnitude of the residues of Metconazole on dry peas Valent Technical Center, Dublin CA, United States of America 2010/1232555 GLP: yes Unpublished
METCON_142	Corley J.	2013	Metconazole: Magnitude of the residue on pea (dry) JRF America, Audubon PA, United States of America 2013/1418321 GLP: yes Unpublished

Code	Author	Year	Title, Institute, Report reference
METCON_143	Leonard R.C.	2005	The magnitude of Metconazole residues in soya beans BASF Agro Research RTP, Research Triangle Park NC, United States of America 2004/5000755 GLP: yes Unpublished
METCON_144	White M.T., Saha M.	2006	The magnitude of residues of Metconazole (BAS 555 F) and its metabolites in soya beans BASF Agro Research RTP, Research Triangle Park NC, United States of America 2006/7006995 GLP: yes Unpublished
METCON_145	Dantas C.	2006	Study on the residues of Metconazole in soya bean (grain) after treatment with Caramba 90 (BAS 555 01 F) in Brazil BASF SA, Resende, Brazil 2006/1008232 GLP: yes Unpublished
METCON_146	Corley J.	2010	Metconazole: Magnitude of the residue on potato United States Department of Agriculture ARS SAA, Tifton GA, United States of America 2010/1232552 GLP: yes Unpublished
METCON_147	Jordan J.M., Saha M.	2006	The magnitude of residues of Metconazole (BAS 555 F) and its metabolites in sugar beet BASF Agro Research RTP, Research Triangle Park NC, United States of America 2006/7006726 GLP: yes Unpublished
METCON_148	White M.T., Saha M.	2006	The magnitude of residues of Metconazole (BAS 555 F) and its metabolies in barley BASF Agro Research RTP, Research Triangle Park NC, United States of America 2006/7006917 GLP: yes Unpublished
METCON_149	Jordan J.M., Saha M.	2006	The magnitude of Metconazole (BAS 555 F) and its metabolites and Pyraclostrobin (BAS 500 F) residues in oats BASF Agro Research RTP, Research Triangle Park NC, United States of America 2006/7006724 GLP: yes Unpublished
METCON_150	Carringer S.J.	2007	Magnitude of the residue of Metconazole and its metabolites in or on field corn and sweet corn raw agricultural commodities and field corn processed commodities following applications of BAS 555 01 F BASF Agro Research RTP, Research Triangle Park NC, United States of America 2006/7012839 GLP: yes Unpublished
METCON_151	Jordan J.M., Saha M.	2006	The magnitude of residues of Metconazole (BAS 555 F) and its metabolites in rye BASF Agro Research RTP, Research Triangle Park NC, United States of America 2006/7006725 GLP: yes

Code	Author	Year	Title, Institute, Report reference
			Unpublished
METCON_152	White M.T., Saha M.	2006	The magnitude of residues of Metconazole (BAS 555 F) and its metabolites in wheat BASF Agro Research RTP, Research Triangle Park NC, United States of America 2006/7006723 GLP: yes Unpublished
METCON_153	White M.T.	2013	Pyraclostrobin + Metconazole: Magnitude of the residue on sugarcane BASF Agricultural Research Center, Research Triangle Park NC, United States of America 2013/7001632 GLP: yes Unpublished
METCON_154	Green C.A.	2006	Magnitude of the residues of Metconazole on pecans Valent U.S.A. Corp.-Valent Technical Center, Dublin CA, United States of America 2006/7017434 GLP: yes Unpublished
METCON_155	Green C.A.	2006	Magnitude of the residues of Metconazole on almonds Valent U.S.A. Corp.-Valent Technical Center, Dublin CA, United States of America 2006/7017431 GLP: yes Unpublished
METCON_156	Beggs C.J. *et al*.	1996	Metconazole (CL 900768) 60 g a.i./L SL (SF 09381) at harvest residue study in autumn oil seed rape-(France, 1995) Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–750-003 GLP: yes Unpublished
METCON_157	Beggs C.J. *et al*.	1997	Metconazole (CL 900768) 60 g ai/l SL (SF 09381): Decline curve residue study in oil seed rape (France-south, 1996) Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–750-004 GLP: yes Unpublished
METCON_158	Beggs C.J. *et al*.	1997	Metconazole (CL 900768) 60 g ai/l SL (SF 09381): At harvest residue study in oil seed rape (France-north, 1996) Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–750-005 GLP: yes Unpublished
METCON_159	Dombo P. *et al*.	1997	Metconazole (CL 900768) 60 g ai/l SL (SF 09381): Decline curve residue study in oil seed rape (France-north, 1996) Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–750-006 GLP: yes Unpublished

Code	Author	Year	Title, Institute, Report reference
METCON_160	Dombo P. *et al*.	1997	Metconazole (CL 900768) 60 g ai/l SL (SF 09381): At harvest residue study in oilseed rape (France-south, 1996) Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–750-007 GLP: yes Unpublished
METCON_161	Scharm M. *et al*.	1999	Metconazole (CL 900768) 90 g ai/l SL (RLF 12307): At harvest residue study on metconazole (CL 900768) in oil seed rape (South-France, 1998) Cyanamid Forschung GmbH, Schwabenheim, Germany Fed.Rep. MK–750-009 GLP: yes Unpublished
METCON_162	Green C.A.	2007	Magnitude of the residues of Metconazole in/on canola and canola processing fractions Valent U.S.A. Corp.-Valent Technical Center, Dublin CA, United States of America 2007/1073345 GLP: yes Unpublished
METCON_163	Corley J.	2013	Metconazole: Magnitude of the residue on sunflower JRF America, Audubon PA, United States of America 2013/1418320 GLP: yes Unpublished
METCON_164	Carringer S.J.	2007	Magnitude of the residue of Metconazole and its metabolites in or on cotton raw agricultural and processed commodities following applications of BAS 555 01 F BASF Agro Research RTP, Research Triangle Park NC, United States of America 2007/7001663 GLP: yes Unpublished
METCON_165	Green C.A.	2006	Magnitude of the residues of Metconazole on peanut nutmeats and peanut processing fractions Valent Technical Center, Dublin CA, United States of America 2006/1051359 GLP: yes Unpublished
METCON_166	Adam D.	2013	^{14}C -Metconazole (BAS 555 F): Simulated processing-Hydrolysis at 90 °C, 100 °C and 120 °C IES-Innovative Environmental Services Ltd., Witterswil, Switzerland 2013/1126040 GLP: yes Unpublished
METCON_167	White M.T., Saha M.	2006	The magnitude of residues of Metconazole (BAS 555 F) and its metabolites in soya bean processing commodities BASF Agro Research RTP, Research Triangle Park NC, United States of America 2006/7006996 GLP: yes Unpublished
METCON_168	Jordan J.M., Saha M.	2006	Magnitude of residues of Metconazole (BAS 555 F) and its metabolites in sugar beets and sugar beet processed fractions following applications of BAS 555 01 F BASF Agro Research RTP, Research Triangle Park NC, United States of America 2006/7006727 GLP: yes

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METCON_169	Plier S.	2015	Determination of residues of BAS 555 F (Metconazole) in barley and its processed products after two applications of BAS 555 00 F in Germany, 2012 BioChem agrar Labor fuer biologische und chemische Analytik GmbH, Gerichshain, Germany Fed.Rep. 2013/1037952 GLP: yes Unpublished
METCON_170	Plier S.	2015	Determination of residues of BAS 555 F (Metconazole) in oat and its processed products after two applications of BAS 555 00 F in Germany, 2012 BioChem agrar Labor fuer biologische und chemische Analytik GmbH, Gerichshain, Germany Fed.Rep. 2013/1037951 GLP: yes Unpublished
METCON_171	White M.T., Saha M.	2006	The magnitude of residues of Metconazole (BAS 555 F) and its metabolites in wheat processing commodities BASF Agro Research RTP, Research Triangle Park NC, United States of America 2006/7007147 GLP: yes Unpublished
METCON_172	Tandy R.	2013	Study on the residue behaviour of Pyraclostrobin (BAS 500 F) and Metconazole (BAS 555 F) in oilseed rape and processed fractions after treatment with BAS 556 03 F in Northern Europe during 2011 Eurofins Agroscience Services, Melbourne Derbyshire DE73 8AG, United Kingdom 2013/1256239 GLP: yes Unpublished
METCON_173	Green C.A.	2008	Magnitude of the residues of Metconazole in chicken eggs and tissues Valent U.S.A. Corp.-Valent Technical Center, Dublin CA, United States of America 2008/8000061 GLP: yes Unpublished
METCON_174	Green C.A.	2006	Magnitude of the residues of Metconazole in dairy cattle and meat Valent Technical Center, Dublin CA, United States of America 2006/1046033 GLP: yes Unpublished
METCON_175	Bitter J., Kowalsky W.	2019	Metconazole: Freezer Storage Stability of M–1 and M–12 Metabolites in Animal Matrices Valent Technical Center, Dublin CA, United States of America 201900114, V–18–200800 GLP: yes Unpublished