FINAL REGISTRATION REPORT

Part B

Section 8

Environmental Fate

Detailed summary of the risk assessment

Product code: BAS 758 00 F

Product name(s): Revyflex Plus

Chemical active substance(s):

Mefentrifluconazole, 66.6 g/L

Metrafenone, 100 g/L

Pyraclostrobin, 80 g/L

Central Zone

Zonal Rapporteur Member State: Poland

CORE ASSESSMENT

(authorization)

Applicant: BASF

Submission date: June 2022

MS Finalisation date: 27/01/2023

Version history

When	What
03/2022	Initial dRR – BASF DocID 2021/2047054
04/2022	Dossier sent for evaluation
06/2022	Updated version - BASF DocID 2022/2035489
10/2022	zRMS evaluation of dRR
January 2023	Final version prepared by zRMS after Commenting period

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Evaluator comments:
The text highlighted in grey was provided by the evaluator.

8 Fate and behaviour in the environment (KCP 9)

8.1 Critical GAP and overall conclusions

Table 8.1-1: Critical use pattern of the formulated product

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Use-No.	**Member state(s)**	**Crop and/or situation** **(crop destination / purpose of crop)**	**F, Fn, Fpn, G, Gn, Gpn or I**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)**	**Application**				**Application rate**			**PHI** **(days)**	**Remarks**	**Conclusion** **Groundwater**
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop / season	Min. interval between applications (days)	L product / ha a) max. rate per appl./ season b) max. total rate per crop/season	kg as/ha a) max rate per appl. b) max. total rate per crop/season Mefentrifluconazole / Metrafenone / Pyraclostrobin	Water L/ha min / max			
Central Zone														
1	AT, DE, BE, NL, IE, PL	wheat TRZAW, TRZAS TRZDU, TRZSP	F	*Oculimacula spp. - PSDCHE* *Blumeria graminis - ERYSGR* *Zymoseptoria tritici - SEPTTR* *Puccinia triticina - PUCCRT* *Puccinia striiformis - PUCCST* *P. tritici-repentis - PYRNTR*	Spraying (SP)	30 - 59	a) 2 b) 2	14	a) 1.50 b) 3.00	a) 0.100* / 0.150** / 0.120*** b) 0.200* / 0.300** / 0.240***	100 / 300	56	For eyespot control, only one application at BBCH 30-32	
2	AT, DE, BE, NL, IE, PL	barley HORVW HORVS	F	*B. graminis - ERYSGR* *Pyrenophora teres - PYRNTE* *R. secalis - RHYNSE* *R. collo-cygni - RAMUCC* *Puccinia hordei - PUCCHD*	Spraying (SP)	30 - 59	a) 2 b) 2	14	a) 1.50 b) 3.00	a) 0.100* / 0.150** / 0.120*** b) 0.200* / 0.300** / 0.240***	100 / 300	56		
3	AT, DE, BE, NL, IE, PL	rye SECCW SECCS SECCE	F	*R. secalis - RHYNSE* *Puccinia recondita - PUCCRE*	Spraying (SP)	30 - 59	a) 2 b) 2	14	a) 1.50 b) 3.00	a) 0.100* / 0.150** / 0.120*** b) 0.200* / 0.300** / 0.240***	100 / 300	56		
4	AT, DE, BE, NL, IE, PL	triticale TTLWI TTLSO	F	*B. graminis - ERYSGR* *Septoria spp. - SEPTSP* *Puccinia recondita - PUCCRE* *Puccinia striiformis - PUCCST*	Spraying (SP)	30 - 59	a) 2 b) 2	14	a) 1.50 b) 3.00	a) 0.100* / 0.150** / 0.120*** b) 0.200* / 0.300** / 0.240***	100 / 300	56		
5	AT, DE, BE, NL, IE	oat AVESA	F	*B. graminis - ERYSGR* *Puccinia coronata - PUCCCA*	Spraying (SP)	30 - 59	a) 2 b) 2	14	a) 1.50 b) 3.00	a) 0.100* / 0.150** / 0.120*** b) 0.200* / 0.300** /	100 / 300	56		

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Use-No.	**Member state(s)**	**Crop and/or situation** **(crop destination / purpose of crop)**	**F, Fn, Fpn, G, Gn, Gpn or I**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)**	**Application**				**Application rate**			**PHI** **(days)**	**Remarks**	**Conclusion** **Groundwater**
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop / season	Min. interval between applications (days)	L product / ha a) max. rate per appl./ season b) max. total rate per crop/season	kg as/ha a) max rate per appl. b) max. total rate per crop/season Mefentrifluconazole / Metrafenone / Pyraclostrobin	Water L/ha min / max			
										0.240***				
6	CZ	wheat TRZAW, TRZAS TRZDU, TRZSP	F	*Oculimacula spp. - PSDCHE* *Blumeria graminis - ERYSGR* *Zymoseptoria tritici - SEPTTR* *Puccinia triticina - PUCCRT* *Puccinia striiformis - PUCCST* *P. tritici-repentis - PYRNTR*	Spraying (SP)	30 - 59	a) 1 b) 1		a) 1.00 – 1.50 b) 1.00 – 1.50	a) 0.100* / 0.150** / 0.120*** b) 0.100* / 0.150** / 0.120***	100 / 300	56	For eyespot control, only one application at BBCH 30-32	
7	CZ	barley HORVW HORVS	F	*B. graminis - ERYSGR* *Pyrenophora teres - PYRNTE* *R. secalis - RHYNSE* *R. collo-cygni - RAMUCC* *Puccinia hordei - PUCCHD*	Spraying (SP)	30 - 59	a) 1 b) 1		a) 1.00 – 1.50 b) 1.00 – 1.50	a) 0.100* / 0.150** / 0.120*** b) 0.100* / 0.150** / 0.120***	100 / 300	56		
8	CZ	rye SECCW SECCS SECCE	F	*R. secalis - RHYNSE* *Puccinia recondita - PUCCRE*	Spraying (SP)	30 - 59	a) 1 b) 1		a) 1.00 – 1.50 b) 1.00 – 1.50	a) 0.100* / 0.150** / 0.120*** b) 0.100* / 0.150** / 0.120***	100 / 300	56		
9	CZ	triticale TTLWI TTLSO	F	*B. graminis - ERYSGR* *Septoria spp. - SEPTSP* *Puccinia recondita - PUCCRE* *Puccinia striiformis - PUCCST*	Spraying (SP)	30 - 59	a) 1 b) 1		a) 1.00 – 1.50 b) 1.00 – 1.50	a) 0.100* / 0.150** / 0.120*** b) 0.100* / 0.150** / 0.120***	100 / 300	56		
10	CZ	oat AVESA	F	*B. graminis - ERYSGR* *Puccinia coronata - PUCCCA*	Spraying (SP)	30 - 59	a) 1 b) 1		a) 1.00 – 1.50 b) 1.00 – 1.50	a) 0.100* / 0.150** / 0.120*** b) 0.100* / 0.150** / 0.120***	100 / 300	56		

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Use-No.	**Member state(s)**	**Crop and/or situation (crop destination / purpose of crop)**	**F, Fn, Fpn, G, Gn, Gpn or I**	**Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)**	**Application**				**Application rate**			**PHI (days)**	**Remarks**	**Conclusion Groundwater**
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop / season	Min. interval between applications (days)	L product / ha a) max. rate per appl./ season b) max. total rate per crop/season	kg as/ha a) max rate per appl. b) max. total rate per crop/season Mefentrifluconazole / Metrafenone / Pyraclostrobin	Water L/ha min / max			
11	HU, RO, SK	wheat TRZAW, TRZAS TRZDU, TRZSP	F	*Oculimacula spp. - PSDCHE* *Blumeria graminis - ERYSGR* *Zymoseptoria tritici - SEPTTR* *Puccinia triticina - PUCCRT* *Puccinia striiformis - PUCCST* *P. tritici-repentis - PYRNTR*	Spraying (SP)	30 - 59	a) 2 b) 2	14	a) 0.50 - 1.00 b) 0.50 - 2.00	a) 0.067* / 0.100** / 0.080*** b) 0.133* / 0.200** / 0.160***	100 / 300	56	For eyespot control, only one application at BBCH 30-32	
12	HU, RO, SK	barley HORVW HORVS	F	*B. graminis - ERYSGR* *Pyrenophora teres - PYRNTE* *Puccinia hordei - PUCCHD*	Spraying (SP)	30 - 59	a) 2 b) 2	14	a) 0.50 - 1.00 b) 0.50 - 2.00	a) 0.067* / 0.100** / 0.080*** b) 0.133* / 0.200** / 0.160***	100 / 300	56		
13	HU, RO, SK	rye SECCW SECCS SECCE	F	*R. secalis - RHYNSE* *Puccinia recondita - PUCCRE*	Spraying (SP)	30 - 59	a) 2 b) 2	14	a) 0.50 - 1.00 b) 0.50 - 2.00	a) 0.067* / 0.100** / 0.080*** b) 0.133* / 0.200** / 0.160***	100 / 300	56		
14	HU, SK, RO	triticale TTLWI TTLSO	F	*B. graminis - ERYSGR* *Septoria spp. - SEPTSP* *Puccinia recondita - PUCCRE* *Puccinia striiformis - PUCCST*	Spraying (SP)	30 - 59	a) 2 b) 2	14	a) 0.50 - 1.00 b) 0.50 - 2.00	a) 0.067* / 0.100** / 0.080*** b) 0.133* / 0.200** / 0.160***	100 / 300	56		
15	HU, SK, RO	oat AVESA	F	*B. graminis - ERYSGR* *Puccinia coronata - PUCCCA*	Spraying (SP)	30 - 59	a) 2 b) 2	14	a) 0.50 - 1.00 b) 0.50 - 2.00	a) 0.067* / 0.100** / 0.080*** b) 0.133* / 0.200** / 0.160***	100 / 300	56		

* Mefentrifluconazole
** Metrafenone
*** Pyraclostrobin

F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor application

(a) Use number(s) in accordance with the list of all intended GAPs in Part B, Section 0 should be given in column 1

(b) No authorization possible for uses where the line is highlighted in grey, Use should be crossed out when the notifier no longer supports this use.

Explanation for column 15 “Conclusion”

A	Safe use	C	To be confirmed by cMS
R	Further refinement and/or risk mitigation measures required	N	No safe use

Table 8.1-2: Assessed (critical) uses during approval of mefentrifluconazole concerning the Section Environmental Fate

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Use-No.	Member state(s)	Crop and/or situation (crop destination / purpose of crop)	F, Fn, Fpn G, Gn, Gpn or I *	Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)	**Application**				**Application rate**			PHI (days)	Remarks: e.g. g safener/ synergist per ha
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between applications (days)	L product/ha a) max. rate per appl. b) max. total rate per crop/season	g as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min/max		
1	EU	Cereals	F	Septoria tritici – SEPTTR further control claims are currently under evaluation	Foliar spray	30-69	2	14	a) 1.50 b) 3.00	150 300	100-300	35	

* F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor application

Table 8.1-3: Assessed (critical) uses during approval of metrafenone concerning the Section Environmental Fate

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Use-No.	Member state(s)	Crop and/or situation (crop destination / purpose of crop)	F, Fn, Fpn G, Gn, Gpn or I *	Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)	Application				Application rate			PHI (days)	Remarks: e.g. g safener/ synergist per ha
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between applications (days)	L product/ha a) max. rate per appl. b) max. total rate per crop/season	g as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min/max		
1	EU	Cereals	F	*Oculimacula spp.* *E. graminis*	Spray	25-69	2	21	a) 0.50 b) 1.00	a) 150 b) 300	100-400	35	

* F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor application

Table 8.1-4: Assessed (critical) uses during approval of pyraclostrobin concerning the Section Environmental Fate

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Use-No.	Member state(s)	Crop and/or situation (crop destination / purpose of crop)	F, Fn, Fpn G, Gn, Gpn or I*	Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)	**Application**				**Application rate**			PHI (days)	Remarks: e.g. g safener/ synergist per ha
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between applications (days)	kg as/hL min/max	g as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min/max		
1	NEU(Germany)	Cereals	F	*leaf diseases*	Spray	25-69	2	appr. 20	0.058	233	400	35	
2	SEU(France)	Cereals	F	*leaf diseases*	Spray	31-65	2	appr. 20	0.080	200	250	30	

* F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor application

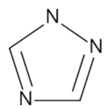
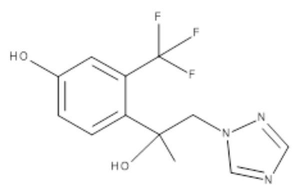
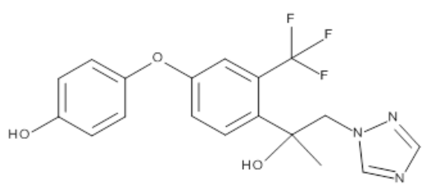
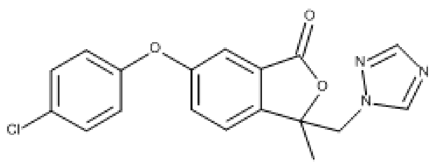
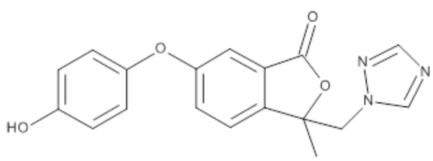
8.2 Metabolites considered in the assessment

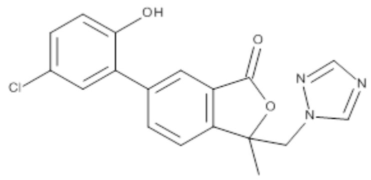
All information provided in this chapter was previously evaluated in the frame of the EU review of mefentrifluconazole (BAS 750 F) and were summarized from the EFSA Conclusion on the active substance [*EFSA (European Food Safety Authority), 2018. Conclusion on the peer review of the pesticide risk assessment of the active substance BAS 750 F (Mefentrifluconazole). EFSA Journal 2018;16(7):5379, 32 pp. doi:10.2903/j.efsa.2018.5379*]. More detailed information were collected from the DAR, when necessary. [*European Commission / RMS UK, Co-RMS AT and FR (2018): Draft Assessment Report prepared according to the Commission Regulation (EU) N° 1107/2009. BAS 750F (Mefentrifluconazole)*].

All information provided in this chapter was previously evaluated in the frame of the EU review of metrafenone (BAS 560 F) and were summarized from *EFSA Scientific Report (2006) 58, 1 - 72, Conclusion on the peer review of metrafenone.*

All information provided in this chapter was previously evaluated in the frame of the EU review of pyraclostrobin (BAS 500 F) and were summarized from SANCO/1420/2001 Monograph 12945/ ECCO/BBA/01.

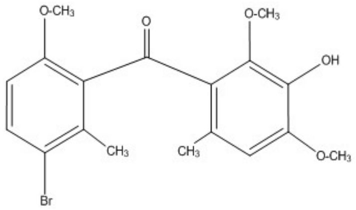
Table 8.2-1: Metabolites of mefentrifluconazole potentially relevant for exposure assessment

Metabolite	Molar mass [g mol^{-1}]	Chemical structure	Maximum observed occurrence in compartments [%]	Exposure assessment required due to
M750F001 (1,2,4-triazole)	69.1		Soil: 5.1[a)] Water: 10.2 Sediment: 4.9 Total w/s system: 15.1	PEC_{soil}: yes[a)] PEC_{gw}: yes[a)] PEC_{sw}: yes PEC_{sed}: yes
M750F003	287.2		Soil: 1.8 Water: 3.8 Sediment: 5.4 Total w/s system: 8.5	PEC_{soil}: no PEC_{gw}: no PEC_{sw}: yes PEC_{sed}: yes
M750F005	379.3		Soil: not detected in soil Water: 32.2 (max. in aqueous photolysis study) Sediment: not detected in sediment Total w/s system: not detected in w/s study	PEC_{soil}: no PEC_{gw}: no PEC_{sw}: yes PEC_{sed}: yes
M750F006	355.8		Soil: not detected in soil Water: 30.7 (max. in aqueous photolysis study) Sediment: not detected in sediment Total w/s system: not detected in w/s study	PEC_{soil}: no PEC_{gw}: no PEC_{sw}: yes PEC_{sed}: yes
M750F007	337.3		Soil: not detected in soil Water: 43.9 (max. in aqueous photolysis study) Sediment: not detected in sediment Total w/s system: not detected in w/s study	PEC_{soil}: no PEC_{gw}: no PEC_{sw}: yes PEC_{sed}: yes

Metabolite	Molar mass [g mol-1]	Chemical structure	Maximum observed occurrence in compartments [%]	Exposure assessment required due to
M750F008	355.8		Soil: not detected in soil Water: 7.3 (max. in aqueous photolysis study) Sediment: not detected in sediment Total w/s system: not detected in w/s study	PEC_{soil}: no PEC_{gw}: no PEC_{sw}: yes PEC_{sed}: yes

a) The metabolite was observed at a single time point above 5% in one soil (max. 5.1% at 90 d with subsequent decline – average of two replicates). For precautionary reasons, it was included in the exposure assessment for soil and groundwater

Table 8.2-2: Metabolites of metrafenone potentially relevant for exposure assessment

Metabolite	Molar mass [g mol-1]	Chemical structure	Maximum observed occurrence in compartments [%]	Exposure assessment required due to
CL 377160	395.3		Soil: 18.9 (photolysis study) a) Water: not detected in water Sediment: ~~not detected in sediment~~ 6.2% Total w/s system: not detected in w/s study	PEC_{soil}: yes PEC_{gw}: yes PEC_{sw}: no PEC_{sed}: no

a) Though the metabolite CL 377160 was observed in soil photolysis studies at concentrations up to 18.9% AR in the first EU evaluation concluded that no metabolites required risk assessment in surface water and sediment. Therefore, no metabolites were included in the residue definition for risk assessment in surface water and sediment in the EFSA Conclusion (EFSA 2006), and PECsw and PECsed values are not calculated for any metabolites here.

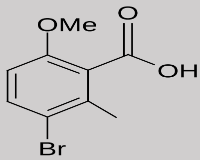
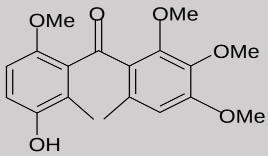
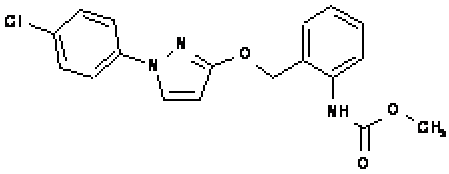
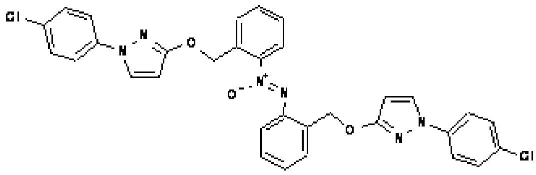
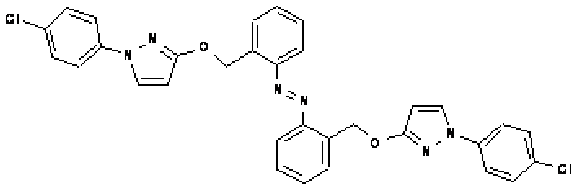
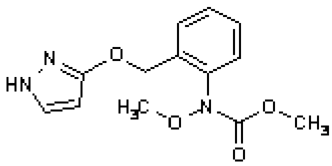
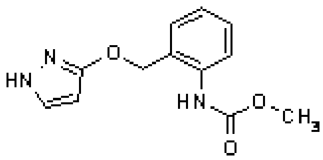
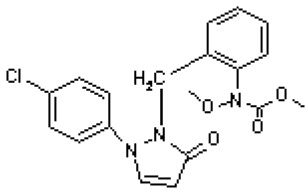
<table>
<tr><td>zRMS Comments:</td><td>In accordance with EFSA, 2006, the metrafenone metabolites CL 375816 and CL 4084564 identified in photolytic or water/sediment degradation study are presented in the table below:
<table>
<tr><th>Metabolite</th><th>Molar mass [g/mol]</th><th>Chemical structure</th><th>Maximum observed occurence in compartments</th><th>Exposure assessment required due to</th></tr>
<tr><td>CL 375816</td><td>245.1</td><td></td><td>Water/Sediment
3.7% in water
6.4% in sediment</td><td>PECsw, PECsed</td></tr>
<tr><td>CL 4084564</td><td>346.4</td><td></td><td>Photolytic degradation in water 8.7%</td><td>PECsw, PECsed</td></tr>
</table></td></tr>
</table>

Table 8.2-3: Metabolites of pyraclostrobin potentially relevant for exposure assessment

Metabolite	Molar mass [g mol^{-1}]	Chemical structure	Maximum observed occurrence in compartments [%]	Exposure assessment required due to
BF 500-3 "des-methoxy" 500M07	357		Soil: 95.8 (anaerobic degradation study); not found in field studies Water: 5.0 (irradiated system) Sediment: 65.7 (dark system), Total w/s system: 67.7 (dark system)	PEC_{soil}: no PEC_{gw}: no PEC_{sw}: no PEC_{sed}: yes
BF 500-6 "azoxy" 500M01	611	 cis-trans isomerization possible	Soil: 30.9 (aerobic laboratory degradation study) Water: not found Sediment: 6.5 (dark system) Total w/s system: 6.5 (dark system)	PEC_{soil}: yes PEC_{gw}: yes PEC_{sw}: no PEC_{sed}: yes
BF 500-7 "azo" 500M02	596	 cis-trans isomerization possible	Soil: 12.5 (aerobic laboratory degradation study) Water: not found Sediment: 6.3 (dark system) Total w/s system: 6.3 (dark system)	PEC_{soil}: yes PEC_{gw}: yes PEC_{sw}: no PEC_{sed}: yes
BF 500-11 "M277" 500M60	277		Soil: not found *Photolysis study* Water: 44.5 (tolyl label) *Irradiated water/sediment study:* Water: 11.4 Sediment: 0.6 Total w/s system: 12.0	PEC_{soil}: no PEC_{gw}: no PEC_{sw}: yes PEC_{sed}: no
BF 500-13 "M247" 500M62	247		Soil: not found *Photolysis study* Water: 16.8 (tolyl label) *Irradiated water/sediment study:* Water: 15.7 Sediment: 2.1 Total w/s system: 17.8	PEC_{soil}: no PEC_{gw}: no PEC_{sw}: yes PEC_{sed}: no
BF 500-14 "M387TypeA" 500M76	387		Soil: not found *Photolysis study* Water: 14.8 (tolyl label) *Irradiated water/sediment study:* Water: 11.4 Sediment: 0.7 Total w/s system: 12.1	PEC_{soil}: no PEC_{gw}: no PEC_{sw}: yes PEC_{sed}: no

8.3 Rate of degradation in soil (KCP 9.1.1)

Studies on degradation in soil with the formulation were not performed, since it is possible to extrapolate from data obtained with the active substances.

Mefentrifluconazole

All information on mefentrifluconazole provided in this chapter was previously evaluated in the frame of the EU review of mefentrifluconazole and were summarized from the EFSA Conclusion on the active substance [*EFSA (European Food Safety Authority), 2018. Conclusion on the peer review of the pesticide risk assessment of the active substance BAS 750 F (Mefentrifluconazole). EFSA Journal 2018;16(7):5379, 32 pp. doi:10.2903/j.efsa.2018.5379*].

EU agreed endpoints for the metabolite 1,2,4-triazole originate from CRD evaluation [*CRD (2014): Triazole Derived Metabolite: 1,2,4-Triazole. Proposed revision to DT50 Summary, Scientific Evaluation and Assessment July 2011, revised September 2011 (after comments from MS and EFSA) and further revised January 2013 (minor clarifications added post-commenting) 24 Oct. 2014*]. All relevant endpoints for 1,2,4-triazole were included in the EFSA Conclusion on the active substance mefentrifluconazole as well.

Metrafenone

All information provided in this chapter was previously evaluated in the frame of the EU review of metrafenone (BAS 560 F) and was summarized from *EFSA Scientific Report (2006) 58, 1 - 72, Conclusion on the peer review of metrafenone.* Some of the endpoints selected for exposure assessment of metrafenone and its metabolites deviate from EU endpoints to comply with latest FOCUS and EFSA guidance documents. Deviations are indicated in the corresponding tables with input parameters for FOCUS models.

Revised kinetic evaluations of existing laboratory soil degradation studies have been performed in the study of Hilton and Callow 2014a (summarized at Appendix 2) in order that DT_{50} values used in the following risk assessments are consistent with FOCUS Kinetics guidance (FOCUS 2006). The laboratory aerobic soil degradation rates of metrafenone, re-calculated in accordance with FOCUS Kinetics guidance and normalised to 20°C and pF2, are presented in Table 8.3-3. The SFO model provided a good visual and statistical fit in all soils, and the results confirmed the persistent nature of metrafenone in laboratory aerobic soils, with a geometric mean DT_{50}, normalized to 20˚C and pF2, of 200.9 days.

Pyraclostrobin

All information provided in this chapter was previously evaluated in the frame of the EU review of pyraclostrobin (BAS 500F) and was summarized from SANCO/1420/2001 Monograph 12945/ ECCO/BBA/01. Some of the endpoints selected for exposure assessment of pyraclostrobin and its metabolites deviate from EU endpoints to comply with latest FOCUS and EFSA guidance documents. Deviations are indicated in the corresponding tables with input parameters for FOCUS models.

8.3.1 Aerobic degradation in soil (KCP 9.1.1.1)

8.3.1.1 Mefentrifluconazole and its metabolites

Table 8.3-1: Summary of aerobic degradation rates for mefentrifluconazole - laboratory studies

Mefentrifluconazole, laboratory studies, dark aerobic conditions							
Soil name/ Soil type a)	**pH**	**t. [ºC] / MWHC [%]**	**DT_{50} / DT_{90} [d] Trigger endpoints, not normalised**	**DT_{50} [d] 20 °C pF2/10kPa d)**	**χ^2 (trigger / modelling) [%]**	**Kinetic model (trigger / modelling)**	**Evaluated on EU level**
Li10 loamy sand (tr)	6.1 b)	20/ 40	>1000/ >1000 α: 0.0656, β: 8.43	477.1	0.3 / 1.6	FOMC / SFO	Yes, EFSA (2018)
Indiana loam (tr)	5.8 b)	20/ 40	>1000/ >1000 α: 0.0762, β: 21.13	366	0.8 / 1.2	FOMC / SFO	Yes, EFSA (2018)
LUFA 5M loamy sand (cp and tr)	7.2 b)	20/ 40	525/ 1870 cp α: 0.0844, β: 12.9 tr k1: 1.2E-1, k2: 1.2E-3, g: 6.6E-2	252	0.3 / 1.4	FOMC cp label, DFOP tr label / SFO	Yes, EFSA (2018)
New Jersey loam (cp and tr)	6.9 c)	20/ 40	488/ >1000 cp k1: 1.7E-1, k2: 2.9E-3, g: 1.1E-1 tr α: 0.229, β: 24.2	134	0.8 / 2.6	DFOP cp label, FOMC tr label / SFO	Yes, EFSA (2018)
New Jersey loam (tf)	6.4 b)	20/ 40	434/ >1000 α: 0.249, β: 28.5	104	1.2 / 2.4	FOMC / SFO	Yes, EFSA (2018)
Geometric mean New Jersey				118			
Geometric mean all soils (if not pH dependent) e)				268 f)			
pH dependence				No			

a) Label designations: chlorophenyl (cp), triazole (tr), trifluoromethlyphenyl (tf)
b) Measured in $CaCl_2$ solution
c) Measured in water
d) Normalised using a Q10 of 2.58 and Walker equation coefficient of 0.7
e) In the geometric mean calculations, the geometric mean value of the New Jersey soil results was considered (i.e. the 'geometric mean all soils (if not pH dependent)' is calculated from the following DT_{50} values: 477.1, 366, 252 and 118)
f) For PEC calculation DT_{50} values from the field study were used

Table 8.3-2: Summary of aerobic degradation rates for 1,2,4-triazole - laboratory studies

M750F001 (1,2,4-triazole), laboratory studies, dark aerobic conditions, metabolite applied as parent.									
Soil type	**pH** [a)]	**t. [ºC] / MWHC [%]**	**k1/ k2/ g [-]**	**DT_{50} fast phase/ DT_{50} slow phase [d]**	**f. f. k_f / k_{dp}**	**DT_{50} [d] 20 °C pF2/10kPa** [b)]	**χ^2 [%]**	**Kinetic model**	**Evaluated on EU level/ Reference**
Sandy loam	6.4	20 ºC / 40 %	0.77 / 0.01 / 0.683	0.9/ 59.2	-	-	-	DFOP	Yes, CRD (2014) EFSA (2018)
Loamy sand	5.8	20 ºC / 40 %	0.46 / 2.8E-3 / 0.580	1.5/ 247.6	-	-	-	DFOP	Yes, CRD (2014) EFSA (2018)
Silt loam	6.7	20 ºC / 40 %	0.87 / 0.03 / 0.443	0.8/ 20.6	-	-	-	DFOP	Yes, CRD (2014) EFSA (2018)
Geometric mean (n = 3)				1.0/ 67.1 / ~~0.569~~ [c)]					
pH dependence				No					

a) Measured in $CaCl_2$ solution
b) Normalised using a Q10 of 2.58 and Walker equation coefficient of 0.7
~~c) For PEC calculation DT_{50} values from the field study were used~~

zRMS Comments:	Based on LoEP for active substance mefentrifluconazole, for its metabolite M750F001 (1,2,4-triazole) the DT_{50} for slow and fast phase are 67.1 d and 1.0 d, respectively.

8.3.1.2 Metrafenone and its metabolites

Table 8.3-3: Summary of aerobic degradation rates for metrafenone - laboratory studies

Metrafenone, Laboratory studies, aerobic conditions							
Soil name/ Soil type	**pH**	**t. [ºC]/ MWHC [%]**	**DT_{50} / DT_{90} [d]**	**DT_{50} [d] 20°C pF2/10kPa**	**χ^2 [%]**	**Kinetic model**	**Evaluated on EU level/ Reference**
Engelstadt, Benz/ Silty loam	7.5	20/ 50	236.0/ 784.0	215.4	2.9	SFO	Yes (EFSA, 2006) – study N – kinetic evaluation
Sporkenheim / Loamy sand	6.2	20/ 50	154.7/ 513.9	154.7	5.9	SFO	Yes (EFSA, 2006) – study N – kinetic evaluation
Binger Pfad/ Sandy loam	7.1	20/ 50	275.3/ 914.4	252.1	5.1	SFO	Y (EFSA, 2006) – study N – kinetic evaluation
Gensingen/ Clay loam	7.3	20/ 20	243.1/ 807.4	194.1	5.0	SFO	Y (EFSA, 2006) – study N – kinetic evaluation
Sporkenheim/ Loamy sand	6.3	10/ 40-50 [a)]	532.6/ 1767.5	206.1	2.7	SFO	Y (EFSA, 2006) – study N – kinetic evaluation
Geometric mean/Median (n=4)				200.9			
pH-dependency: y/n				No			

a) As a worst-case assumption soil moisture content in the study was assumed as 50 % MWHC for the entire study duration.
* The moisture and temperature normalised geometric mean DT_{50} value at 20°C was calculated with the exclusion of the Sporkenheim soil test performed at 10°C.

The laboratory aerobic soil degradation rate of the soil photolysis metabolite CL 377160 was also investigated in three soils (see Appendix 2). CL 377160 was rapidly degraded in all three soils under aerobic conditions, with concentrations in solvent extracts <10 % AR in all three soils after 7 days incubation. Thus, it was not possible to calculate reliable degradation rates for CL 377160, and a worst-case DT_{90} value of 7 days was estimated. Because of the low number of data points, re-calculation of degradation rates for CL 377160 in accordance with FOCUS Kinetics guidance was not possible; however, a soil DT_{50} value of 7 days is an appropriate worst-case value for use in exposure assessments.

8.3.1.3 Pyraclostrobin and its metabolites

All information regarding triggering endpoints on pyraclostrobin provided in this chapter was previously evaluated in the frame of the EU review of pyraclostrobin.

Table 8.3-4: Summary of aerobic degradation rates for pyraclostrobin - laboratory studies

Pyraclostrobin, Laboratory studies, aerobic conditions										
Soil name	**Soil type**	**pH**	**Temp [ºC]**	**MWHC [%]**	**DT_{50} [d]**	**DT_{90} [d]**	**DT_{50} [d] 20°C pF2/ 10kPa**	**r^2**	**Kinetic model**	**Evaluated on EU level/ Reference**
Bruch West (tolyl-label) [a)]	Loamy sand	7.3	20	40	12	143	-	0.99	bi-phasic (best fit)	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
Bruch West (chlorophenyl-label) [a)]	Loamy sand	7.5	20	40	14	152	-	0.996	bi-phasic (best fit)	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
Lufa 2.2 [b)]	Loamy sand	5.4	20	40	101	not calc.	-	0.99	bi-phasic (best fit)	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
Li 35 b [b)]	Loamy sand	6.5	20	40	50	163	-	0.98	bi-phasic (best fit)	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
US 771-15 [b)]	Loamy sand	5.6	20	40	38	not calc.	-	0.98	bi-phasic (best fit)	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
Canada [b)]	Loam	7.7	20	40	85	not calc.	-	0.98	bi-phasic (best fit)	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
Lufa 2.2 [b)]	Loamy sand	5.4	20	20	137	not calc.	-	0.99	bi-phasic (best fit)	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
Lufa 2.2 [b)]	Loamy sand	5.4	5	40	not calc.	not calc.	-	–	–	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
Lufa 2.2 [b)]	Loamy sand	5.4	30	40	86	not calc.	-	0.98	bi-phasic (best fit)	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01

Pyraclostrobin, Laboratory studies, aerobic conditions										
Soil name	**Soil type**	**pH**	**Temp [°C]**	**MWHC [%]**	**DT_{50} [d]**	**DT_{90} [d]**	**DT_{50} [d] 20°C pF2/ 10kPa**	**r^2**	**Kinetic model**	**Evaluated on EU level/ Reference**
Lufa 2.2 [b] (sterile)	Loamy sand	5.4	20	40	not calc.	not calc.	-	–	–	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
Geometric mean (n = 8)					49 (not used for calculations)					
pH-dependency					No					

not calc. Not calculated (degradation time > twofold of study duration)
[a] Aerobic soil metabolism study
[b] Aerobic degradation in soil

Table 8.3-5: Summary of aerobic degradation rates for BF 500-6 - laboratory studies

BF 500-6, Laboratory studies, aerobic conditions										
Soil name	**Soil type**	**pH [a]**	**Temp [°C]**	**MWHC [%]**	**DT_{50} [d]**	**DT_{90} [d]**	**DT_{50} [d] 20°C, pF2/ 10kPa**	**r^2**	**Kinetic model**	**Evaluated on EU level/ Reference**
Bruch West (tolyl-label)	Loamy sand	7.3	20	40	129	428	-	0.99	Compart-ment model from parent study	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
Bruch West (chlorophenyl-label)	Loamy sand	7.5	20	40	166	552	-	0.996	Compart-ment model from parent study	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
Geometric mean (n=2)					**146 (not used for calculations)**					
pH-dependency					**No**					

[a] $CaCl_2$

Table 8.3-6: Summary of aerobic degradation rates for BF 500-7 - laboratory studies

BF 500-7, Laboratory studies, aerobic conditions										
Soil name	**Soil type**	**pH a)**	**Temp [°C]**	**MWHC [%]**	**DT_{50} [d]**	**DT_{90} [d]**	**DT_{50} [d] 20°C, pF2/ 10kPa**	**r^2**	**Kinetic model**	**Evaluated on EU level/ Reference**
Bruch West (tolyl-label)	Loamy sand	7.3	20	40	112	372	-	0.99	Compart-ment model from parent study	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
Bruch West (chlorophenyl -label)	Loamy sand	7.5	20	40	159	529	-	0.996	Compart-ment model from parent study	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
Geometric mean (n=2)					**133 (not used for calculations)**					
pH-dependency					**No**					

a) $CaCl_2$

8.3.2 Anaerobic degradation in soil (KCP 9.1.1.1)

8.3.2.1 Mefentrifluconazole and its metabolites

Table 8.3-7: Summary of anaerobic degradation rates for mefentrifluconazole - laboratory studies

Mefentrifluconazole, laboratory studies, dark anaerobic conditions							
Soil type	**pH a)**	**t. [ºC] / MWHC [%]**	**DT_{50} / DT_{90} [d]**	**DT_{50} [d] 20 °C b)**	**χ^2 [%]**	**Kinetic model**	**Evaluated on EU level/ Reference**
Li10 loamy fine sand (tr)	6.1	20 / flooded	349 / >1000	Not calculated	3.51	SFO	Yes, EFSA (2018)
LUFA 5M sandy loam (tr)	7.2	20 / flooded	- / - c)	-	-	-	Yes, EFSA (2018)
Indiana loam (tr)	5.6	20 / flooded	390 / >1000	Not calculated	2.8	SFO	Yes, EFSA (2018)
New Jersey loam (cp) (tr) d)	6.6	20 / flooded	899 / >1000	Not calculated	2.8	SFO	Yes, EFSA (2018)

a) Measured in $CaCl_2$ solution
b) Normalised using a Q10 of 2.58
c) No discernible decline for BAS 750 F was observed, therefore kinetics were not investigated
d) Data treated as 4 replicates, 2 from each radiolabel

No major metabolites were detected under anaerobic conditions for mefentrifluconazole.

8.3.2.2 Metrafenone and its metabolites

The anaerobic route and rate of degradation of metrafenone in laboratory soils were assessed during the first EU review, and a summary of the EU risk assessment is provided in the EFSA Conclusion for metrafenone (EFSA 2006).

Two anaerobic soil degradation studies were conducted at 20°C using both [trimethoxyphenyl-U-^{14}C]- and [bromophenyl-U-^{14}C]- labelled metrafenone. Metrafenone was observed to degrade relatively rapidly compared to aerobic conditions (see Appendix 2). When only the ‘bioavailable’ extracts were considered, up to six metabolites were identified. Of these metabolites CL 377160, found at a maximum of 5.3% AR, CL 434223 at a maximum of 8.2% AR (may contain CL 377160), and CL 4084564 occurring at a maximum concentration of 7.3% AR, were the only metabolites observed at concentrations > 5 % AR. However, none of the metabolites exceeded 5 % AR at consecutive time-points, and none were increasing at the study termination, therefore no anaerobic metabolite triggers further assessment in groundwater. At the study end (120 DAT), unextracted residues reached 29.5 – 38.3% AR and mineralization 0.2 – 0.5% AR.

Degradation rates of metrafenone in anaerobic soil were re-calculated in accordance with FOCUS Kinetics guidance. The SFO kinetic model provided the best fit to the data on the basis of a statistical and visual assessment. The re-calculated anaerobic soil DT_{50} values for metrafenone at 20°C, of 7.3 days and 15.6 days confirmed the faster degradation of metrafenone under anaerobic soil conditions (Hilton and Callow 2014a; see summary in Appendix 2).

Anaerobic soil conditions are expected to occur mainly in the winter. The typical application timing of metrafenone, i.e. spring/summer, is likely to avoid significant occurrence of anaerobic conditions at application, however, given the apparent persistence of metrafenone under aerobic conditions, it is possible that for the proposed use on cereals, in some rare instances on certain soil types, soil residues of metrafenone will experience anaerobic conditions. Under anaerobic conditions, it would be expected that metrafenone would degrade more rapidly to a large number of minor metabolites. However as stated above there are no anaerobic metabolites which trigger risk assessment.

8.3.2.3 Pyraclostrobin and its metabolites

Table 8.3-8: Summary of anaerobic degradation rates for pyraclostrobin – laboratory studies

Pyraclostrobin, Laboratory studies, anaerobic conditions							
Soil name/ Soil type	**pH a)**	**Temp [°C]/ MWHC [%]**	**DT_{50} [d]**	**DT_{90} [d]**	**r^2**	**Kinetic model**	**Evaluated on EU level/ Reference**
Bruch West (tolyl-label)/ Sandy loam	7.5	20/ flooded	2	5	0.981	SFO	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
Bruch West (chlorophenyl-label)/ Loamy sand	7.2	20/ flooded	3	9	0.980	SFO	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
Major metabolites		BF 500-3 max. 95.8 % after 7 d					

a) $CaCl_2$

8.4 Field studies (KCP 9.1.1.2)

Studies on degradation in soil with the formulation were not performed, since it is possible to extrapolate from data obtained with the active substances.

8.4.1 Soil dissipation testing on a range of representative soils (KCP 9.1.1.2.1)

8.4.1.1 Mefentrifluconazole and its metabolites

All information on mefentrifluconazole (BAS 750 F) provided in this chapter was previously evaluated in the frame of the EU review of mefentrifluconazole and were summarized from the EFSA Conclusion on the active substance [*EFSA (European Food Safety Authority), 2018. Conclusion on the peer review of the pesticide risk assessment of the active substance BAS 750 F (Mefentrifluconazole). EFSA Journal 2018;16(7):5379, 32 pp. doi:10.2903/j.efsa.2018.5379*].

EU agreed endpoints for the metabolite 1,2,4-triazole originate from CRD evaluation [*CRD (2014): Triazole Derived Metabolite: 1,2,4-Triazole. Proposed revision to DT50 Summary, Scientific Evaluation and Assessment July 2011, revised September 2011 (after comments from MS and EFSA) and further revised January 2013 (minor clarifications added post-commenting) 24 Oct. 2014*]. All relevant endpoints for 1,2,4-triazole were included in the EFSA Conclusion on the active substance mefentrifluconazole as well.

Triggering endpoints

Table 8.4-1: Summary of aerobic degradation rates for mefentrifluconazole - field studies

Mefentrifluconazole, field studies									
Soil type	**Location**	**pH** [a]	**Depth [cm]**	**DT_{50} [d] Actual Trigger, k1/k2/g where appropriate**	**DT_{90} [d] Actual Trigger**	**DT_{50} [d] Norm** [b]**. Modelling**	**St. (χ^2)**	**Method of calculation**	**Evaluated on EU level**
Sandy loam	Bogense, Denmark	6.4	0-50	185.5	616.1	96.5	9.2 / 9.4	SFO / SFO	Yes, EFSA (2018)
Loamy sand	Lentzke, East Germany	5.4	0-50	350.6	>1000	184.0	8.9 / 9.0	SFO / SFO	Yes, EFSA (2018)
Silt loam	Goch-Nierswalde, West Germany	6.5	0-50	267.6	889.1	146.7	16.2 /17.5	SFO / SFO	Yes, EFSA (2018)
Silty clay loam	Stotzheim, France	7.4	0-50	145.4 [c]/ 262.1 [d] 2.027E-2 / 2.17E-3 / 0.3389	870.2	128.6	8.4 / 6.2	DFOP / SFO	Yes, EFSA (2018)
Silty clay loam	Poggio Renatico, Italy	7.6	0-50	846.6	>1000	610.8	9.4 / 8.5	SFO / SFO	Yes, EFSA (2018)
Loamy sand	Utrera, Spain	7.4	0-50	200.5 [c]/ 292.6 [d] 9.477E-2 / 2.087E-3/0.2401	971.6	313.0	6.3 / 14.2	DFOP / SFO	Yes, EFSA (2018)
Geometric mean (if not pH dependent)						200.0			
pH dependence						No			

a) Measured in $CaCl_2$ solution
b) Normalised using a Q10 of 2.58 and Walker equation coefficient of 0.7, values are $DegT_{50}$matrix
c) Overall value
d) Calculated Value: Overall $DegT_{90}$/3.32

Table 8.4-2: Summary of aerobic degradation rates for 1,2,4-triazole - field studies: trigger endpoints

M750F001 (1,2,4-triazole), Field studies – Trigger endpoints										
Soil type	**Location**	**pH** [a)]	**Depth [cm]**	**DT_{50} [d] actual**	**DT_{90} [d] actual**	**χ^2 [%]**	**DT_{50} [d] Norm** [b)]**.**	**f. f. k_f / k_{dp}**	**Method of calculation**	**Evaluated on EU level/ Reference**
Silt loam	Germany	6.4	0-30	7.8	366.7	15.2	See table Table 8.4-3 for normalised endpoints	-	FOMC	Yes, CRD (2014) [c)] EFSA (2018)
Silty clay loam	Italy	7.6	0-40	21.2	207.4	10.7		-	DFOP	Yes, CRD (2014) [c)] EFSA (2018)
Sandy loam	UK	7.4	0-40	6.8	109.3	17.8		-	DFOP	Yes, CRD (2014) [c)] EFSA (2018)
Loam	Spain	5.8	0-30	28.1	717.6	13.3		-	DFOP	Yes, CRD (2014) [c)] EFSA (2018)
Geometric mean (if not pH dependent)										
Arithmetic mean					-					
pH dependence					No					

a) Measured in $CaCl_2$ solution
b) Normalised using a Q10 of 2.58 and Walker equation coefficient of 0.7 values are $DegT_{50}$matrix

Modelling endpoints

Table 8.4-3: Summary of aerobic degradation rates for 1,2,4-triazole - field studies: modelling endpoints

M750F001 (1,2,4-triazole), Field studies – Modelling endpoints									
Soil type	**Location**	**pH** [a)]	**Depth [cm]**	**DT_{50} [d] Fast phase (k1)**	**DT_{50} [d] Slow phase (k2)**	**'g' [-]**	**χ^2**	**Method of calculat ion**	**Evaluated on EU level/ Reference**
Silt loam	Germany	6.4	0-30	2.5 (0.277)	70.7 (9.8E-3)	0.655	18.8	DFOP	Yes, CRD (2014) EFSA (2018)
Silty clay loam	Italy	7.6	0-40	1.4 (0.495)	59.8 (0.116)	0.364	10.6	DFOP	Yes, CRD (2014) EFSA (2018)
Sandy loam	UK	7.4	0-40	0.5 (1.386)	25.1 (0.028)	0.458	18.1	DFOP	Yes, CRD (2014) EFSA (2018)
Loam	Spain	5.8	0-30	4.6 (0.151)	126.0 (5.5E-3)	0.489	12.7	DFOP	Yes, CRD (2014) EFSA (2018)
Geometric mean (n = 4)				1.68 [b)]	60.5 [b)]			DFOP	
Arithmetic mean						0.489 [b)]			

a) Measured in $CaCl_2$ solution
b) Agreed endpoints

8.4.1.2 Metrafenone and its metabolites

The DT_{50} values for metrafenone in laboratory aerobic soil degradation studies are >60 days, the threshold for triggering the requirement for field dissipation studies. Data for the dissipation of metrafenone in field soils were assessed during the first EU review and are available and adequate to enable extrapolation to the behaviour of the formulated product.

The fate and behaviour of metrafenone in field soil is discussed in detail in Section B.8 of Volume 3 of the DAR for metrafenone, and a summary of the EU risk assessment is provided in the EFSA Conclusion for metrafenone (EFSA 2006). However, that EFSA Conclusion includes the following in the 'List of Studies to be Generated, Still Ongoing or Available but not Peer Reviewed' section:

- Final reports of the field soil accumulation study should be provided when available (formal data requirement relevant for all representative uses evaluated)

The field soil accumulation studies of Johnson 2006a-d are now included with this submission and are summarized in Appendix 2. The final versions of these soil accumulation reports replace the previous interim versions (Smalley 2002m; Young 2002a & b; Jones 2002b) assessed during the first EU review. In addition, revised kinetic evaluations of existing field dissipation studies have been performed in the study of Hilton and Callow 2014b (see summary in Appendix 2) in order that calculated DT_{50} values are consistent with FOCUS Kinetics guidance (FOCUS 2006).

Field dissipation trials were conducted at four sites in Europe: located in Germany, United Kingdom, Denmark and Northern France. A single application of an SC formulation of metrafenone was applied to bare soil at a rate of approximately 0.4 kg as/ha. Soil samples, in the form of soil cores with a depth of 54 – 60 cm, were collected up to 482 – 487 days after application. Cores were separated into 10 cm depth segments and analyzed for metrafenone and CL 377160. An LOQ of 0.02 mg/kg was reported for both analytes, which was equivalent to 8.7 – 11.8 % of the maximum metrafenone residues observed in the individual trials. Metrafenone was not observed above the LOQ below the 0-10 cm soil layer in any of the trials. CL 377160 was not observed above the LOQ in any soil layer in any of the trials.

DT_{50} values were calculated in accordance with FOCUS Kinetics guidance in the study of Hilton and Callow 2014b (Summarised at Appendix 2). SFO kinetics gave the best fit for the trials conducted in Germany and the UK, whereas trials conducted in Northern France and Denmark displayed biphasic degradation for metrafenone. DT_{50} values of 22.2 to 145 days (n = 4, non-normalized) were obtained for metrafenone, with DT_{90} values of 473 to >1000 days (n = 3; a DT_{90} value could not be calculated for the Denmark trial). A summary of the calculated field DT_{50} values for metrafenone is presented in Table 8.4-4 The values are appropriate for comparison to persistence triggers. However, the EFSA Conclusion reports that the field dissipation studies are not appropriate for the derivation of endpoints for use in modelling.

The EFSA Conclusion (2006) reports that because applications were made to bare soil, the shorter DT_{50} values observed in field dissipation studies, compared to laboratory aerobic soil degradation studies, may be due to the contribution of soil photolysis. It was concluded that since the field studies were performed on bare soils and the representative uses are for developed crops where the foliage will shadow the field, laboratory studies should be considered to derive the DT_{50} values for use in risk assessments. Field DT_{50} values for use in modelling were therefore not calculated.

Triggering endpoints

Table 8.4-4: Summary of aerobic degradation rates for metrafenone - field studies: Triggering endpoints

Metrafenone, Field studies – Triggering endpoints								
Location/ Soil type	**pH [a)]**	**Depth [cm]**	**$DissT_{50}$ [d] actual**	**DT_{90} [d] actual**	**Kinetic parameters**	**χ^2 [%]**	**Method of calculation**	**Evaluated on EU level/ Reference**
Germany/ Silt loam (bare soil)	7.5	0-10	143	473	k = 0.00486 ± 0.00175	12.6	SFO	Y (EFSA, 2006) – study N – kinetic evaluation
UK/ Loam (bare soil)	7.7	0-10	145	483	k = 0.00477 ± 0.00505	31.5	SFO	Y (EFSA, 2006) – study N – kinetic evaluation
Nothern France/ Silt (bare soil)	8.1	0-10	22.2	1221 [b)]	α=0.42419 ± 0.31989 β=5.38648 ± 12.5453	22.6	FOMC	Y (EFSA, 2006) – study N – kinetic evaluation
Denmark/ Loam (bare soil)	7.1	0-10	51.7	NC [b)]	kfast=0.03486 ± 0.02227 kslow=0.00007 ± 0.00118 g=0.597	9.6	DFOP	Y (EFSA, 2006) – study N – kinetic evaluation
Maximum (n=x)			145	1221 [b)]				

a) Not stated
b) Value extrapolated beyond study duration
c) NC – Not calculated by KINGUII

8.4.1.3 Pyraclostrobin and its metabolites

All information regarding triggering endpoints on pyraclostrobin provided in this chapter was previously evaluated in the frame of the EU review of pyraclostrobin. Modelling endpoints are provided in Horn (2006) [*HORN, A. (2006): Normalisation of the degradation rate constant of BAS 500 F - pyraclostrobin in the field to a reference temperature of 20°C and a reference soil moisture at pF2. - BASF DocID 2006/1007384*]. A summary can be found in Appendix 2.

Triggering endpoints

Table 8.4-5: Summary of aerobic degradation rates for pyraclostrobin - field studies: Trigger endpoints – Original values

Pyraclostrobin, Field studies – Triggering endpoints – Original values								
Soil type (German class)	**Location**	**pH** a)	**Depth [cm]** b)	**$DissT_{50}$ [d] actual**	**DT_{90} [d] actual**	**r^2**	**Method of calculation**	**Evaluated on EU level**
sandy loam / loamy sand	Spain, Manzanilla ALO/01/98	7.6	0 – 50	8	117	0.99	bi-phasic (best fit)	Yes, Monograph 12945/ ECCO/BBA/01
sandy loam	Spain, Alcala de Rio ALO/02/98	7.6	0 – 50	2	230	0.99	bi-phasic (best fit)	Yes, Monograph 12945/ ECCO/BBA/01
loamy sand	Sweden, Bjärred HUS/02/98	5.8	0 – 50	31	103	0.92	SFO	Yes, Monograph 12945/ ECCO/BBA/01
loamy silt	Germany, Bad Sass. D08/01/97	6.8	0 – 50	37	122	0.999	SFO	Yes, Monograph 12945/ ECCO/BBA/01
loamy sand	Germany, Meckenheim D05/02/97	6.2	0 – 50	25	83	0.997	SFO	Yes, Monograph 12945/ ECCO/BBA/01
loamy sand	Germany, Großharrie DU2/02/97	5.6	0 – 50	26	85	0.91	SFO	Yes, Monograph 12945/ ECCO/BBA/01
			Maximum (n = 6)	37 (Germany) c)				

a) $CaCl_2$
b) Soil samples were taken up to a depth of 50 cm. However, pyraclostrobin was only found in the top 10 cm.
c) The EU Review Report (SANCO/1420/2001) summarizes the DT50 range as 8 - 55 d. However, there is no detailed information on how these values were derived.

Modelling endpoints

Table 8.4-6: Summary of aerobic degradation rates for pyraclostrobin - field studies: Modelling endpoints

Pyraclostrobin, Field studies – Modelling endpoints							
Soil type (German class.)	**Location**	**pH** [a)]	**Depth [cm]** [b)]	**DT_{50} [d] 20°C, pF2** [c)]	**r^2/err [%]** [d)]	**Kinetic model** [e)]	**Evaluated on EU level/ Reference**
sandy loam / loamy sand	Spain, Manzanilla ALO/01/98	7.6	0 – 50	– [e)]	–		No, Horn (2006), BASF DocID 2006/1007384 (Appendix)
sandy loam	Spain, Alcala de Rio ALO/02/98	7.6	0 – 50	– [e)]	–		No, Horn (2006), BASF DocID 2006/1007384 (Appendix)
loamy sand	Sweden, Bjärred HUS/02/98	5.8	0 – 50	20.6	0.888/ 20.2	SFO	No, Horn (2006), BASF DocID 2006/1007384 (Appendix)
loamy sand	Germany, Meckenheim D05/02/97	6.2	0 – 50	12.5	0.994/ 5.1	SFO	No, Horn (2006), BASF DocID 2006/1007384 (Appendix)
loamy silt	Germany, Bad Sass. D08/01/97	6.8	0 – 50	26.5	0.997/ 3.3	SFO	No, Horn (2006), BASF DocID 2006/1007384 (Appendix)
loamy sand	Germany, Großharrie DU2/02/97	5.6	0 – 50	15.3	0.845/ 22.0	SFO	No, Horn (2006), BASF DocID 2006/1007384 (Appendix)
Geometric mean (n=4)				**18**			
pH-dependency				**No**			

a) $CaCl_2$
b) Soil samples were taken up to a depth of 50 cm. However, pyraclostrobin was only found in the top 10 cm.
c) Q_{10}-factor of 2.2 was used for temperature correction
d) Minimum error to pass χ^2 test.
e) Bi-phasic degradation: single first-order model not applicable. Sites not representative for European conditions.

8.4.2 Soil accumulation testing (KCP 9.1.1.2.2)

8.4.2.1 Mefentrifluconazole

A terrestrial field accumulation study with mefentrifluconazole is ongoing. Study design and related information are presented in the DAR (*European Commission / RMS UK, Co-RMS AT and FR (2018): Draft Assessment Report prepared according to the Commission Regulation (EU) N° 1107/2009. BAS 750F (Mefentrifluconazole) - Volume 3 – B.8 (AS)*).

8.4.2.2 Metrafenone

On the basis that DT_{90} values derived from the field dissipation studies exceeded 1 year, soil accumulation is required to be addressed. Data to assess the field accumulation in soil of metrafenone were evaluated during the first EU review. However, the four studies (Smalley, 2002m; Young, 2002a & b; Jones, 2002b) were not finalized at the time the EFSA Conclusion (EFSA 2006) was produced. The studies are now finalized as Johnston 2006a-d, and therefore a full summary for the four studies is presented at Appendix 2.

The four soil accumulation studies were conducted on bare soil plots in Italy and Spain, and on two plots at a site in Schwabenheim Germany; the first cropped with vines and the second cropped with cereals. Spray applications of varying SC formulations of metrafenone were applied at all trial sites annually between 1999 and 2004 inclusive (For the Schwabenheim cereal trial applications were made annually up to 2005, with the exception of 2001, when no applications were made).

Samples were collected annually from both treated and untreated plots in the form of 20 x 30 cm soil cores. The total soil residue concentration of metrafenone in three of the four trials was observed to have reached a plateau by the study termination, while for the Schwabenheim cereal trial, a definitive judgement was complicated by the samples from 2004 which could not be analyzed. The maximum total accumulated metrafenone soil concentrations observed were 0.19 - 0.69 mg/kg.

No quantifiable residues of metabolite CL 377160 were ever observed in any layer of any sample for three of the four studies, and in the Schwabenheim were only rarely observed in the 0 – 5 cm soil layer, with a maximum concentration in that soil layer of 0.007 mg/kg.

Worst-case values of a K_{om} of 3223 L/kg (corresponding to the worst-case K_{oc} of 5556 L/kg) and a 1/n of 0.85, with a DT_{50} value of 345.4 days (the worst-case laboratory DT_{50} from the original review corrected to 20˚C and pF2), were input into the model for metrafenone. As a worst-case assumption, all metrafenone in the top 1 m of soil was considered to be present in the top 5 cm of the soil layer.

The modelled accumulation plateau was reached after approximately 10 years of annual applications. Peak accumulated PEC_{soil} values for the FOCUS scenarios were 0.426 – 0.832 mg/ kg, 0.453 – 0.843 mg/kg, and 0.656 – 1.336 mg/kg for the modelled applications to winter cereals, spring cereals and vines, respectively.

Comparison of the peak concentrations observed in the field accumulation studies to those from modelling demonstrated the conservative nature of the modelling previously submitted. Both, the soil accumulation studies and the PEARL modelling, were performed for cereal GAPs in which a larger annual total dose was assumed than is being proposed in the critical GAP of BAS 758 00 F of 300 g as/ ha (2 x 150 g as/ ha) to cereals. Peak accumulated soil concentrations arising from the applied for use would therefore be anticipated to be lower than those observed in soil accumulation studies. Maximum accumulated PEC_{soil} values for metrafenone for the proposed GAP are additionally presented at point 8.7 below.

Though accumulation studies are available, concentrations in soil due to accumulation are also addressed by calculations according to latest requirements for the GAP of the present product (please refer to point 8.7 below).

8.4.2.3 Pyraclostrobin

Soil accumulation studies were not required for pyraclostrobin (SANCO/1420/2001).

8.5 Mobility in soil (KCP 9.1.2)

Studies on mobility in soil with the formulation were not performed, since it is possible to extrapolate from data obtained with the active substances.

8.5.1 Mefentrifluconazole and its metabolites

All information on mefentrifluconazole provided in this chapter was previously evaluated in the frame of the EU review of mefentrifluconazole and were summarized from the EFSA Conclusion on the active substance [*EFSA (European Food Safety Authority), 2018. Conclusion on the peer review of the pesticide risk assessment of the active substance BAS 750 F (Mefentrifluconazole). EFSA Journal 2018;16(7):5379, 32 pp. doi:10.2903/j.efsa.2018.5379*].

EU agreed endpoints for the metabolite 1,2,4-triazole originate from CRD evaluation [*CRD (2014): Triazole Derived Metabolite: 1,2,4-Triazole. Proposed revision to DT50 Summary, Scientific Evaluation and Assessment July 2011, revised September 2011 (after comments from MS and EFSA) and further revised January 2013 (minor clarifications added post-commenting) 24 Oct. 2014*]. All relevant endpoints for 1,2,4-triazole were included in the EFSA Conclusion on the active substance mefentrifluconazole as well.

Table 8.5-1: Summary of soil adsorption/desorption for mefentrifluconazole

Mefentrifluconazole								
Soil Type (USDA)	**OC %**	**Soil pH (measured in water)**	**K_d [mL g^{-1}]**	**K_{doc} [mL g^{-1}]**	**K_F [mL g^{-1}]**	**K_{Foc} [mL g^{-1}]**	**1/n**	**Evaluated on EU level**
Indiana loam	1.22	5.7	-	-	48.46	3972.29	0.95	Yes, EFSA (2018)
New Jersey loam	1.00	6.8	-	-	35.61	3560.75	0.96	Yes, EFSA (2018)
Obhiro loam	3.40	6.9	-	-	126.14	3709.90	1.01	Yes, EFSA (2018)
Fiorentino Poggio Renatico 1 loam	1.00	8.2	-	-	31.43	3143.03	0.92	Yes, EFSA (2018)
La Gironda sandy clay loam	1.22	8.3	-	-	24.53	2010.28	0.94	Yes, EFSA (2018)
Li10 loamy sand	0.95	6.9	-	-	36.34	3824.78	1.02	Yes, EFSA (2018)
LUFA 5M sandy loam	1.10	7.4	-	-	35.83	3251.56	1.00	Yes, EFSA (2018)
LUFA 2.1 sand	0.60	6.5	-	-	29.59	4930.94	1.00	Yes, EFSA (2018)
Geometric mean (n = 8; if not pH dependent)					39.93	3455.59		
Arithmetic mean (n = 8; if not pH dependent)							0.975	
pH dependence			No					

Table 8.5-2: Summary of soil adsorption/desorption for 1,2,4-triazole

M750F001 (1,2,4-triazole)								
Soil Type	**OC %**	**Soil pH** a)	**K_d [mL g^{-1}]**	**K_{doc} [mL g^{-1}]**	**K_F [mL g^{-1}]**	**K_{Foc} [mL g^{-1}]**	**1/n**	**Evaluated on EU level**
Silty clay	0.70	8.8	-	-	0.833	120	0.897	Yes, CRD (2014) EFSA (2018)
Clay loam	1.74	6.9	-	-	0.748	43	0.827	Yes, CRD (2014) EFSA (2018)
Silty clay loam	0.70	7.0	-	-	0.722	104	0.922	Yes, CRD (2014) EFSA (2018)
Sandy loam	0.81	6.9	-	-	0.720	89	1.016	Yes, CRD (2014) EFSA (2018)
Geometric mean (n = 4)						83		
Arithmetic mean (n = 4)					0.756	89	0.916	
pH dependence			No					

a) Measured in $CaCl_2$ solution

Table 8.5-3: Summary of soil adsorption/desorption for the aquatic metabolites of mefentrifluconazole

Estimated adsorption coefficients for the aquatic metabolites of mefentrifluconazole a)								
Metabolite name	**OC %**	**Soil pH**	**K_d [mL g^{-1}]**	**K_{doc} [mL g^{-1}]**	**K_F [mL g^{-1}]**	**K_{Foc} [mL g^{-1}]**	**1/n**	**Evaluated on EU level**
M750F003	n.a.	n.a.	-	-	-	597.6	n.a.	Yes, EFSA (2018)
M750F005	n.a.	n.a.	-	-	-	7863	n.a.	Yes, EFSA (2018)
M750F006	n.a.	n.a.	-	-	-	4919	n.a.	Yes, EFSA (2018)
M750F007	n.a.	n.a.	-	-	-	3938	n.a.	Yes, EFSA (2018)
M750F008	n.a.	n.a.	-	-	-	17240	n.a.	Yes, EFSA (2018)
pH dependence			n.a.					

n.a. not available
a) Adsorption coefficients (K_{oc}) were estimated for metabolites of BAS 750 F that occurred in studies with BAS 750 F in aqueous systems. QSAR method implemented in the KocWIN (EPISuite) tool was used.

8.5.2 Metrafenone and its metabolites

Table 8.5-4: Summary of soil adsorption/desorption for metrafenone

Metrafenone							
Soil name	**Soil type**	**OC (%)**	**pH ($CaCl_2$)**	**K_f (mL/g)**	**K_{foc} (mL/g)**	**1/n (-)**	**Evaluated on EU level y/n/ Reference**
Inveresk	Sandy loam	4.65	5.8	258	5556	0.85	Yes (EFSA, 2006)
Speyer 2.2	Loamy sand	2.29	5.9	86.9	3794	0.95	Yes (EFSA, 2006)
Engelstadt/Benz	Silty loam	2.27	7.4	36.2	1592	0.92	Yes (EFSA, 2006)
Ingelhein/Moers	Sandy loam	1.33	7.6	31.5	2367	0.94	Yes (EFSA, 2006)
Schwabenheim	Silty loam	1.09	5.9	24.1	2214	0.89	Yes (EFSA, 2006)
Geometric mean (n=5)					2812	-	
Arithmetic mean (n=5)					3105	0.91	Yes (EFSA, 2006)
pH-dependency y/n					No		

Table 8.5-5: Summary of soil adsorption/desorption for CL 377160

CL 377160							
Soil Name	**Soil Type**	**OC (%)**	**pH ($CaCl_2$)**	**K_f (mL/g)**	**K_{foc} (mL/g)**	**1/n (-)**	**Evaluated on EU level y/n/ Reference**
Mechtildshausen	Loam	1.22	7.27	264.1	21649	1.130	Y (EFSA, 2006)
Mussig	Clay Loam	2.98	7.53	73.5	2465	0.982	Y (EFSA, 2006)
Bretagne 2	Silt loam	1.91	5.52	66.1	3459	0.982	Y (EFSA, 2006)
Huffoltz	Silty clay loam	2.67	5.42	63.1	2199	0.986	Y (EFSA, 2006)
LUFA 2.2	Loamy sand	2.19	5.80	62.1	2722	0.990	Y (EFSA, 2006)
Geometric mean (n=5)					4061	-	
Arithmetic mean (n=5)					6499	1.014	Y (EFSA, 2006)
pH-dependency y/n					No		

8.5.3 Pyraclostrobin and its metabolites

All information provided in this chapter was previously evaluated in the frame of the EU review of pyraclostrobin (BAS 500F) and were summarized from SANCO/1420/2001 Monograph 12945/ ECCO/BBA/01.

Table 8.5-6: Summary of soil adsorption/desorption for pyraclostrobin

Pyraclostrobin							
Soil name	**Soil type (USDA)**	**OC [%]**	**pH [-]**	**K_f [mL g^{-1}]**	**K_{foc} [mL g^{-1}]**	**1/n [-]**	**Evaluated on EU level**
Li 35 b	sand	0.8	6.4	60	7500	0.896	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
LUFA 2.2	loamy sand	1.9	5.6	304	16000	1.025	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
Bruch West	sandy loam	1.8	7.3	142	7889	1.012	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
USA 538-30-5	loamy sand	0.5	5.9	30	6000	0.861	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
USA 538-31-2	sandy loam	0.6	5.3	54	9000	0.873	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
CAN-95024	sandy loam	3.9	7.6	368	9436	1.005	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
Arithmetic mean (n=6)					-	0.95	
Geometric mean (n=6)					8856	-	
pH-dependency					No		

Table 8.5-7: Summary of soil adsorption/desorption for BF 500-3

BF 500-3							
Soil Name	**Soil type (USDA)**	**OC [%]**	**pH [-]**	**K_f [mL g^{-1}]**	**K_{foc} [mL g^{-1}]**	**1/n [-]**	**Evaluated on EU level**
LUFA 2.2	Sand/ loamy sand	2.5	5.8	268	10700	0.942	Yes, Monograph 12945/ECCO/BBA/01
Bruch West	Sandy loam	1.5	7.5	63.5	4240	0.688	Yes, Monograph 12945/ECCO/BBA/01
Li 35 b	Loamy sand	1.1	6.5	74.3	6750	0.802	Yes, Monograph 12945/ECCO/BBA/01
USA 538-30-5	Loamy sand	0.4	5.8	47.3	11800	0.942	Yes, Monograph 12945/ECCO/BBA/01
USA 538-31-2	Loam	0.5	5.2	60.1	12000	0.773	Yes, Monograph 12945/ECCO/BBA/01
CAN-95012	Sandy clay loam	3.4	7.5	354	10400	0.831	Yes, Monograph 12945/ECCO/BBA/01
Arithmetic mean (n=6)					-	0.830	
Geometric mean (n=6)					8757	-	
pH-dependency					No		

Table 8.5-8: Summary of soil adsorption/desorption for BF 500-6

BF 500-6							
Soil Name	**Soil type (USDA)**	**OC [%]**	**pH [-]**	**K_f [mL g^{-1}]**	**K_{foc} [mL g^{-1}]**	**1/n [-]**	**Evaluated on EU level**
LUFA 2.2	Sand/ loamy sand	2.5	5.8	84	3360	– a)	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
Bruch West	Sandy loam	1.5	7.5	248	16550	– a)	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
Li 35 b	Loamy sand	1.1	6.5	350	31830	– a)	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
USA 538-30-5	Loamy sand	0.4	5.8	366	91650	– a)	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
USA 538-31-2	Loam	0.5	5.2	634	126800	– a)	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
CAN-95012	Sandy clay loam	3.4	7.5	630	18500	– a)	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
Arithmetic mean (n=6)					48115	-	
Geometric mean (n=6)					26919	-	
pH-dependency					No		

a) Freundlich exponents are not available. Due to low water solubility only one concentration was considered.

Table 8.5-9: Summary of soil adsorption/desorption for BF 500-7

BF 500-7							
Soil Name	**Soil type (USDA)**	**OC [%]**	**pH [-]**	**K_f [mL g^{-1}]**	**K_{foc} [mL g^{-1}]**	**1/n [-]**	**Evaluated on EU level**
LUFA 2.2	Sand/ loamy sand	2.5	5.8	101	4020	– a)	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
Bruch West	Sandy loam	1.5	7.5	450	29950	– a)	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
Li 35 b	Loamy sand	1.1	6.5	418	37950	– a)	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
USA 538-30-5	Loamy sand	0.4	5.8	544	135900	– a)	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
USA 538-31-2	Loam	0.5	5.2	750	149900	– a)	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
CAN-95012	Sandy clay loam	3.4	7.5	543	15950	– a)	Yes, SANCO/1420/2001, Monograph 12945/ECCO/BBA/01
Arithmetic mean (n=6)					62278	-	
Geometric mean (n=6)					33776	-	
pH-dependency					No		

a) Freundlich exponents are not available. Due to low water solubility only one concentration was considered.

8.5.4 Column leaching (KCP 9.1.2.1)

Mefentrifluconazole

Column leaching studies were not performed for mefentrifluconazole and its metabolites.

Metrafenone

No studies were assessed for the first EU review, and none are required under Reg. 1107/2009.

Pyraclostrobin

The mobility in soil of pyraclostrobin and its metabolites were evaluated during the Annex I inclusion (SANCO/1420/2001). No additional column leaching studies have been performed.

Pyraclostrobin as well as its metabolites showed very high K_{oc} values (BAS 500 F > 6000 mL/g, BF 500-6 > 3300 mL/g and BF 500-7 > 4000 mL/g, BF 500-3 > 4000 mL/g). In aged and non-aged column leaching studies, no residues were found in any of the leachates and all radioactivity remained in the top soil layer.

8.5.5 Lysimeter studies (KCP 9.1.2.2)

Mefentrifluconazole

Lysimeter studies were not performed for mefentrifluconazole and its metabolites as based on PEC_{gw} calculations no leaching is expected.

Metrafenone

No studies were assessed for the first EU review, and none are required under Reg. 1107/2009.

Pyraclostrobin

The mobility in soil of pyraclostrobin and its metabolites were evaluated during the Annex I inclusion (SANCO/1420/2001). No additional studies have been performed. Neither the active substance nor its metabolites revealed any risk for groundwater contamination. Lysimeter studies were therefore considered unnecessary.

8.5.6 Field leaching studies (KCP 9.1.2.3)

Mefentrifluconazole

Field leaching studies were not performed for mefentrifluconazole and its metabolites as based on PEC_{gw} calculations no leaching is expected.

Metrafenone

No studies were assessed for the first EU review, and none are required under Reg. 1107/2009.

Pyraclostrobin

The mobility in soil of pyraclostrobin and its metabolites were evaluated during the Annex I inclusion (SANCO/1420/2001). No additional studies have been performed. Neither the active substance nor its metabolites revealed any risk for groundwater contamination. Field leaching studies were therefore considered unnecessary.

8.6 Degradation in the water/sediment systems (KCP 9.2, KCP 9.2.1, KCP 9.2.2, KCP 9.2.3)

Studies on degradation in water/sediment systems with the formulation were not performed, since it is possible to extrapolate from data obtained with the active substances.

8.6.1 Mefentrifluconazole and its metabolites

All information on mefentrifluconazole provided in this chapter was previously evaluated in the frame of the EU review of mefentrifluconazole and were summarized from the EFSA Conclusion on the active substance [*EFSA (European Food Safety Authority), 2018. Conclusion on the peer review of the pesticide risk assessment of the active substance BAS 750 F (Mefentrifluconazole). EFSA Journal 2018;16(7):5379, 32 pp. doi:10.2903/j.efsa.2018.5379*].

EU agreed endpoints for the metabolite 1,2,4-triazole originate from CRD evaluation [*CRD (2014): Triazole Derived Metabolite: 1,2,4-Triazole. Proposed revision to DT50 Summary, Scientific Evaluation and Assessment July 2011, revised September 2011 (after comments from MS and EFSA) and further revised January 2013 (minor clarifications added post-commenting) 24 Oct. 2014*]. All relevant endpoints for 1,2,4-triazole were included in the EFSA Conclusion on the active substance mefentrifluconazole as well.

Table 8.6-1: Summary of degradation in water/sediment of mefentrifluconazole

Mefentrifluconazole distribution (max. sediment 75.7% after 28 days)											
Persistence endpoints											
Water / sediment system	**pH water phase**	**pH sed a)**	**t. °C**	**DT_{50} / DT_{90} whole system**	**St. (χ^2)**	**DT_{50} / DT_{90} water**	**St. (χ^2)**	**DT_{50} / DT_{90} sediment**	**St. (χ^2)**	**Kinetic model**	**Evaluated on EU level**
Berghäuser Altrhein [c]	7.4, 8.4 [d)]	7.1, 7.0 [d)]	20	122.2/444.0	2.0	6.6 [g)]/21.9	6.4	224.8/746.7	4.0	DFOP FOMC SFO	Yes, EFSA (2018)
Ranschgraben [c]	7.3, 7.1 [d)]	5.2, 6.0 [d)]	20	213.1/785.6	1.3	7.9 [g)]/26.2	6.7	395.6/>1000	1.0	HS FOMC SFO	Yes, EFSA (2018)
Modeling endpoints											
Water / sediment system	**pH water phase**	**pH sed a)**	**t. °C**	**Modeling $DegT_{50}$ whole system e)**	**St. (χ^2)**	**Modeling $DisT_{50}$ water f)**	**St. (χ^2)**	**Modeling $DisT_{50}$ sediment f)**	**St. (χ^2)**	**Method of calculation**	**Evaluated on EU level**
Berghäuser Altrhein[c)]	7.4, 8.4 [d)]	7.1, 7.0 [d)]	20	125.5	2.8	6.6 [g)]	6.4	224.8	4.0	SFO FOMC	Yes, EFSA (2018)
Ranschgraben [c]	7.3, 7.1[d)]	5.2, 6.0[d)]	20	212.8	2.7	7.9 [g)]	6.7	395.6	1.0	SFO FOMC	Yes, EFSA (2018)
Geometric mean at 20°C [b)]				163.4		7.2		298.2			

a) Measured in $CaCl_2$ solution
b) Normalised using a Q10 of 2.58
c) Residues from the three different label experiments (chlorophenyl-, triazole- and trifluoromethylphenyl-label) were considered as replicates
d) pH at field sampling from two different sampling events
e) Degradation rate
f) Dissipation rate
g) Calculated as $DT_{50} = DT_{90}/3.32$

Table 8.6-2: Summary of observed metabolites

Compound **Observed in…**	**Maximum observed occurrence in compartments [%]**	**Evaluated on EU level**
M750F001 (1,2,4-triazole) Water/sediment system	Max in total system: 15.1% after 100 days Max in water: 10.2% after 100 days Max in sediment: 4.9% after 100 days kinetic formation fraction (kf/kdp): not calculated No DT_{50} was derived from parent studies	Yes, EFSA (2018)
M750F003 Water/sediment system	Max in total system: 8.5% (mean of replicates) after 100 days Max in water: 3.8% after 100 days Max in sediment: 5.4% after 100 days kinetic formation fraction (kf/kdp): not calculated No DT_{50} was derived from parent studies	Yes, EFSA (2018)
M750F005 Aqueous photolysis study	Max in water: 32.2% after 6 days	Yes, EFSA (2018)
M750F006 Aqueous photolysis study	Max in water: 30.7% after 9 days	Yes, EFSA (2018)
M750F007 Aqueous photolysis study	Max in water: 43.9% after 15 days	Yes, EFSA (2018)
M750F008 Aqueous photolysis study	Max in water: 7.3% after 13 days	Yes, EFSA (2018)

8.6.2 Metrafenone and its metabolites

Table 8.6-3: Summary of degradation in water/sediment of metrafenone

Metrafenone Distribution (max. sediment 56.9% after 3 days)										
Water/sediment system	**pH water / sed.**	**$DegT_{50}$ whole system (d)**	**$DegT_{90}$ whole system (d)**	**Kinetic, Fit**	**$DissT_{50}$ water (d)**	**$DissT_{90}$ water (d)**	**Kinetic, Fit**	**$DissT_{50}$ sed. (d)**	**Kinetic, Fit**	**Evaluated on EU level y/n/ Reference**
Goose River – bromophenyl label	7.9/ 8.0	8.4	27.8	SFO	-	-	-	-	-	Y (EFSA, 2006) – study N – kinetic evaluation
Goose River – trimethoxyphenyl label	7.9/ 8.0	9.4	31.2	SFO	-	-	-	-	-	Y (EFSA, 2006) – study N – kinetic evaluation
Golden Pond – bromophenyl label	8.4/ 7.7	9.1	30.2	SFO	-	-	-	-	-	Y (EFSA, 2006) – study N – kinetic evaluation
Golden Pond – trimethoxyphenyl label	8.4/ 7.7	9.9	32.9	SFO	-	-	-	-	-	Y (EFSA, 2006) – study N – kinetic evaluation
Geometric mean (n=4)		9.2	30.5		-	-		-		-

Table 8.6-4: Summary of observed metabolites

Compound **Observed in…**	**Maximum observed occurrence in compartments [%]**	**Evaluated on EU level**
CL377160 **Water/sediment system**	Max. in water/sediment 4.0 – 6.5 % after 7 - 14 d Max in water 0.1 – 1.7 %AR after 7 - 14 d. Max. in sed. 3.4 – 6.2 %AR after 7 d.	Yes (EFSA, 2006)
CL375816 **Water/sediment system**	Max. in water/sediment 3.1 – 8.4 % after 56 - 100 d Max in water 1.4 – 3.7 %AR after 100 d. Max. in sed. 2.2 – 6.4 %AR after 56 d.	Yes (EFSA, 2006)

Table 8.6-3: Summary of degradation in water/sediment of CL377160

CL377160 Distribution (max. sediment 6.2% after 7 days)										
Water/sediment system	**pH water / sed.**	**$DegT_{50}$ whole system (d)**	**$DegT_{90}$ whole system (d)**	**Kinetic, Fit**	**$DissT_{50}$ water (d)**	**$DissT_{90}$ water (d)**	**Kinetic, Fit**	**$DissT_{50}$ sed. (d)**	**Kinetic, Fit**	**Evaluated on EU level y/n/ Reference**
Goose River – bromophenyl label	7.9/ 8.0	13.6	45.3	Peak down SFO	-	-	-	-	-	Y (EFSA, 2006) – study N – kinetic evaluation
Goose River – trimethoxyphenyl label	7.9/ 8.0	8.2	27.2	Peak down SFO	-	-	-	-	-	Y (EFSA, 2006) – study N – kinetic evaluation
Golden Pond – bromophenyl label	8.4/ 7.7	-	-	Peak down SFO*	-	-	-	-	-	Y (EFSA, 2006) – study N – kinetic evaluation
Golden Pond – trimethoxyphenyl label	8.4/ 7.7	-	-	Peak down SFO*	-	-	-	-	-	Y (EFSA, 2006) – study N – kinetic evaluation
Geometric mean (n=4)					-	-		-		-

8.6.3 Pyraclostrobin and its metabolites

All information on pyraclostrobin provided in this chapter was previously evaluated in the frame of the EU review of pyraclostrobin. Additionally, a more recent recalculation of the results of the irradiated water/sediment study was carried out following the recommendations of the FOCUS work group on degradation kinetics in order to derive aquatic degradation endpoints for modelling Miles (2012) [*MILES, B. (2012): Kinetic evaluation of BAS 500 F in water/sediment systems under aerobic conditions. - BASF DocID 2012/1021122*] (see Appendix 2). The results of this study are summarized in the following table. The experimental data were evaluated using single first order (SFO) kinetic models at levels P-I, P-II and M-I. In addition to the parent compound, the metabolites BF 500-3, BF 500-11, BF 500-13 and BF 500-14 were considered.

Table 8.6-5: Summary of degradation in water/sediment of pyraclostrobin

Pyraclostrobin distribution

Dark system, pond: max. sediment 53% after 14 d, decreasing to 7% after 100 d; *river*: max. sediment 62% after 2 d, decreasing to 10% after 100 d

Irradiated system: max. occurrence in sediment 18.3% after 7 d, decreasing to 0.3% after 62 d.

Water/ sediment system	pH water / sed.	$DegT_{50}$ whole system [d]	$DegT_{90}$ whole system [d]	Kinetic Fit	$DissT_{50}$ water [d]	$DissT_{90}$ water [d]	Kinetic Fit	$DissT_{50}$ sed. [d]	Evaluated on EU level
Kastenberg-heide (pond system) [a]	8.4 / 7.1	27 / 29 [c]	89	Graph-ical best fit / SFO[D]	3 / 8.7 [c]	41	Graph-ical best fit / SFO[D]	33 [f]	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
Altrhein (river system) [a]	8.1 / 7.3	29 [e]	96 [e]	Graph-ical best fit	1 / 1 [c]	9	Graph-ical best fit / SFO[D]	9 [f]	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
Kellmetsch-weiher [b]	8.6 / 7.5				5	–	SFO, r^2= 0.994	4 [g]	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01

a) Dark water/sediment study.
b) Irradiated water/sediment study.
c) Recalculated by RMS using Timme and Frehse Model
d) Where one value is presented, it is based on graphical best fit. Where two values presented, first value was estimated by graphical best fit, while second value was estimated by RMS using Timme and Frehse Model (SFO).
e) Low r^2 value (0.5593)
f) Kinetics estimated by graphical best fit
g) Kinetics estimated by SFO, r^2 = 0.994

Table 8.6-6: Summary of degradation in water/sediment of pyraclostrobin under irradiated conditions – recalculations according to FOCUS recommendations

Water/ sediment system	pH water / sed.	$DegT_{50}$ whole system [b)] [d]	$DegT_{90}$ whole system [d]	$DissT_{50}$ water [c)] [d]	$DissT_{90}$ water [d]	$DissT_{50}$ sed. [d)] [d]	$DissT_{90}$ sed. [d]	$DegT_{50}$ water [e)] [d]	$DegT_{50}$ sed. [f)] [d]	Evaluated on EU level
Kellmetsch -weiher [a)]	8.6 / 7.5	7.22	-	4.47	-	5.93	-	7.50	6.48	No, Miles (2012) BASF DocID 2012/1021122 (Appendix)

a) Irradiated water/sediment study.
b) Kinetic fit: level P-I, SFO, $\chi 2$ = 4.568%
c) Kinetic fit: level P-I, SFO, $\chi 2$ = 5.346%
d) Kinetic fit: level P-I, SFO, $\chi 2$ = 3.300%
e) Kinetic fit: level P-II, SFO, χ^2 = 3.0%
f) Kinetic fit: level P-II, SFO, χ^2 = 12.0%

Table 8.6-7: Summary of observed metabolites in water/sediment systems

Compound Observed in…	Maximum observed occurrence in compartments [%]	Evaluated on EU level
BF 500-3 Water/sediment system	*Dark system*: max. water 2.3% after 61 d; max. sediment 65.7% after 14 d (river system, mean of both labels), max. total system 67.7% *Irradiated system*: max water 5.0% after 30 d; max. sediment 16.9% after 30 d (tolyl-label)	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
BF 500-6 Water/sediment system	*Dark system*: Not found in water; max. sediment 6.5% after 61 d (pond system, mean of both labels) *Irradiated system*: Not found	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
BF 500-7 Water/sediment system	*Dark system*: Not found in water; max. sediment 6.3% after 61 d (pond system, mean of both labels) *Irradiated system*: Not found	Yes, SANCO/1420/2001, Monograph 12945/ ECCO/BBA/01
BF 500-11 Water/sediment system	*Dark system*: Not found *Irradiated system*: max. water 11.4% after 21 d, max. sediment 0.6% after 62 d (tolyl-label), max. total system 12.0%	Yes, Monograph 12945/ ECCO/BBA/01
BF 500-13 Water/sediment system	*Dark system*: Not found *Irradiated system*: max. water 15.7% after 62 d, max. sediment 2.1% after 45 d (tolyl-label)), max. total system 17.8%	Yes, Monograph 12945/ ECCO/BBA/01
BF 500-14 Water/sediment system	*Dark system*: Not found *Irradiated system*: max. water 11.4% after 14 d, max. sediment 0.7% after 7 d (chlorophenyl-label)), max. total system 12.1%	Yes, Monograph 12945/ ECCO/BBA/01

Table 8.6-8: Summary of degradation in water/sediment of BF 500-3

Water/ sediment system	**pH water / sed.**	**DegT$_{50}$ whole system [d]**	**DegT$_{90}$ whole system [d]**	**Kinetic Fit**	**DissT$_{50}$ water [d]**	**DissT$_{90}$ water [d]**	**Kinetic Fit**	**DissT$_{50}$ sed. [d]**	**Kinetic Fit**	**Evaluated on EU level**
Kastenberg-heide (pond system) [a)]	8.4 / 7.1	–	–	–	–	–	–	Not reported [c)]	SFO, r^2= 0.967	Yes, Monograph 12945/ ECCO/BBA/01
Altrhein (river system) [a)]	8.1 / 7.3	–	–	–	–	–	–	54.8	SFO, r^2= 0.942	Yes, Monograph 12945/ ECCO/BBA/01
Kellmetsch-weiher [b)]	8.6 / 7.5	–	–	–	–	–	–	99	SFO, r^2= 0.994	Yes, Monograph 12945/ ECCO/BBA/01

a) Dark water/sediment study.
b) Irradiated water/sediment study.
c) Calculated value extrapolated too far beyond the period of investigation.

Table 8.6-9: Summary of degradation in water/sediment of BF 500-6

Water/ sediment system	**pH water / sed.**	**DegT$_{50}$ whole system [d]**	**DegT$_{90}$ whole system [d]**	**Kinetic Fit**	**DissT$_{50}$ water [d]**	**DissT$_{90}$ water [d]**	**Kinetic Fit**	**DissT$_{50}$ sed. [d]**	**Kinetic Fit**	**Evaluated on EU level**
Kastenberg-heide (pond system) [a)]	8.4 / 7.1	–	–		–	–		116.3	SFO, r^2= 0.967	Yes, Monograph 12945/ ECCO/BBA/01

a) Dark water/sediment study.

Table 8.6-10: Summary of degradation in water/sediment of BF 500-7

Water/ sediment system	**pH water / sed.**	**DegT$_{50}$ whole system [d]**	**DegT$_{90}$ whole system [d]**	**Kinetic Fit**	**DissT$_{50}$ water [d]**	**DissT$_{90}$ water [d]**	**Kinetic Fit**	**DissT$_{50}$ sed. [d]**	**Kinetic Fit**	**Evaluated on EU level**
Kastenberg-heide (pond system) [a)]	8.4 / 7.1	–	–	–	–	–	–	80.0	SFO, r^2= 0.967	Yes, Monograph 12945/ ECCO/BBA/01

a) Dark water/sediment study.

Table 8.6-11: Summary of degradation in water/sediment of BF 500-11

Water/ sediment system	pH water / sed.	$DegT_{50}$ whole system [d]	$DegT_{90}$ whole system [d]	Kinetic Fit	$DissT_{50}$ water [d]	$DissT_{90}$ water [d]	Kinetic Fit	$DissT_{50}$ sed. [d]	Kinetic Fit	Evaluated on EU level
Kellmetsch-weiher [a)]	8.6 / 7.5	–	–	–	20	–	SFO, r^2= 0.994	–	–	Yes, Monograph 12945/ ECCO/BBA/01

a) Irradiated water/sediment study.

Table 8.6-12: Summary of degradation in water/sediment of BF 500-13

Water/ sediment system	pH water / sed.	$DegT_{50}$ whole system [d]	$DegT_{90}$ whole system [d]	Kinetic Fit	$DissT_{50}$ water [d]	$DissT_{90}$ water [d]	Kinetic Fit	$DissT_{50}$ sed. [d]	Kinetic Fit	Evaluated on EU level
Kellmetsch-weiher [a)]	8.6 / 7.5	–	–	–	- [b)]	–	-	–	–	Yes, Monograph 12945/ ECCO/BBA/01

a) Irradiated water/sediment study.
b) No dissipation rate could be determined from the data.

Table 8.6-13: Summary of degradation in water/sediment of BF 500-14

Water/ sediment system	pH water / sed.	$DegT_{50}$ whole system [d]	$DegT_{90}$ whole system [d]	Kinetic Fit	$DissT_{50}$ water [d]	$DissT_{90}$ water [d]	Kinetic Fit	$DissT_{50}$ sed. [d]	Kinetic Fit	Evaluated on EU level
Kellmetsch-weiher [a)]	8.6 / 7.5	–	–	–	14	–	SFO, r^2= 0.994	–	–	Yes, Monograph 12945/ ECCO/BBA/01

a) Irradiated water/sediment study.

Table 8.6-14: Degradation in water/sediment of pyraclostrobin metabolites under irradiated conditions – Recalculations according to FOCUS recommendations

Metabolite	$DegT_{50}$ whole system [d]	Kinetic Fit	$DissT_{50}$ water [d]	Kinetic Fit	$DissT_{50}$ sed. [d]	Kinetic Fit	Evaluated on EU level
BF 500-11	22.62	SFO, χ^2=6.41	25.22	SFO, χ^2=7.62	–	–	No, Miles (2012) BASF DocID 2012/1021122 (Appendix)
BF 500-13 [a)]	–	–	–	–	–	–	No, Miles (2012BASF DocID 2012/1021122 (Appendix)
BF 500-14	17.29	SFO, χ^2=5.30	15.88	SFO, χ^2=5.16	–	–	No, Miles (2012BASF DocID 2012/1021122 (Appendix)
BF 500-03	92.54	SFO, χ^2=1.56	–	–	78.55	SFO, χ^2=1.74	No, Miles (2012BASF DocID 2012/1021122 (Appendix)

a) No reliable values could be determined from the data.

8.7 Predicted Environmental Concentrations in soil (PEC_{soil}) (KCP 9.1.3)

<table>
<tr><td>zRMS Comments:</td><td>
Calculations of PEC_S for active substances and their metabolites and formulation were accepted.
For PEC soil assessment used endpoints were agreed at the EU level and proposed pattern use in winter and spring cereals was considered.
Based on LoEP for active substance pyraclostrobin, for PECs assessment the DT_{50} of 55 d was used (the longest DT_{50} in field studies, LoEP 2004).
The initial and cumulative (if relevant) PEC_S for active substances, their metabolites and formulation values are presented in the tables below.
<table>
<tr><th rowspan="3">Parent/ Metabolite</th><th colspan="2">Winter and spring cereals</th></tr>
<tr><th>PECs, ini</th><th>$PEC_{accumulation}$</th></tr>
<tr><th colspan="2">mg a.s/kg</th></tr>
<tr><td>Mefentrifluconazole</td><td>0.053</td><td>~~0.205~~ 0.092</td></tr>
<tr><td>1,2,4-triazole</td><td>< 0.001</td><td>< 0.001</td></tr>
<tr><td>Metrafenone</td><td>0.079</td><td>~~0.158~~ 0.099</td></tr>
<tr><td>CL377160</td><td>< 0.001</td><td>-</td></tr>
<tr><td>Pyraclostrobin</td><td>0.059</td><td>-</td></tr>
<tr><td>BF 500-6</td><td>0.014</td><td>0.065</td></tr>
<tr><td>BF 500-7</td><td>0.005</td><td>0.026</td></tr>
</table>
The former presented PECs accum values than correct ones. In both cases the higher values could be used in further risk assessment in Section 9, as they represent a worse case.
For formulation the relevant tillage depth of 5 cm was considered.
<table>
<tr><th>Crop</th><th>Application rate L/ha</th><th>PEC_{act} mg/kg</th></tr>
<tr><td>Winter and spring cereals</td><td>1.50</td><td>0.437</td></tr>
</table>
These values will be used in further risk assessment.
</td></tr>
</table>

8.7.1 Justification for new endpoints

Mefentrifluconazole

No deviation from the EU-agreed endpoints [*EFSA Conclusion, 2018*].

Metrafenone

No deviation from the EU-agreed endpoints [*EFSA Conclusion, 2006*].

Pyraclostrobin

No deviation from the EU-agreed endpoints [EU Review Report, 2004; Monograph 2001].

Field DT_{50} values in the EU Review Report on pyraclostrobin (SANCO/1420/2001; page 12) are erroneously listed. The worst-case field DT_{50} of 37 days, as listed in the monograph 12945/ECCO/BBA/01 of pyraclostrobin, was used for calculations. Regarding the metabolites BF 500-6 and BF 500-7, worst-case default DT_{50} values of 1000 days were used in contradiction to the values listed in the monograph.

8.7.2 Active substance(s) and relevant metabolite(s)

Table 8.7-1: Input parameters related to application for PEC_{soil} calculations to cereals

Use No.		**1-15**
Crop		**Cereals**
BBCH stage		**30**
Application rate (g a.s/ha)	Mefentrifluconazole	100
	Metrafenone	150
	Pyraclostrobin	120
Number of applications [-] / interval [d]		2 / 14*
Crop Interception [%]		80
Depth of soil layer for PEC_{max} [cm]		5
Depth of soil layer (relevant for plateau concentration) [cm]		20 (mixing depth for annual crops)
Models used for calculation		ESCAPE 2.0

* Twofold application covers single application as risk envelope approach.

8.7.2.1 Mefentrifluconazole and its metabolite

Comments of zRMS:	The submitted calculations report was accepted. The endpoints agreed at the EU level were used in PECsoil assessment. The calculations were performed in accordance with FOCUS guidance.

Reference:	CP 9.1.3/1
Report	Predicted environmental concentrations of BAS 750 F - mefentrifluconazole and its metabolites in soil and groundwater following application to spring and winter cereals in Europe, Liebisch O., 2021 report No 2599 DocID 2021/2040773 Authority registration No
Guideline(s):	FOCUS Kinetics (2006) SANCO/10058/2005 v 2.0 FOCUS (2014) Generic guidance for FOCUS Kinetics, v 1.1 FOCUS Groundwater (2000) Sanco/321/2000 FOCUS Groundwater (2009) Sanco/13144/2010 v3 of 2014 FOCUS Groundwater (2021) GG for Tier 1 GW Assessments, v2.3
Deviations:	No
GLP:	No, not compulsory to PEC reports
Acceptability:	Yes

Table 8.7-2: Input parameters for mefentrifluconazole and its metabolite for PEC_{soil} calculations

Compound	**Mefentrifluconazole**	**1,2,4-triazole**	**Value in accordance to EU endpoint y/n Reference**
Molecular weight [g/mol]	397.8	69.1	Yes EFSA (2018)
Max. occurrence [%]	- a)	5.1 (DAT 90, laboratory, dark aerobic conditions)	Yes EFSA (2018)
DT_{50} [d]	846.6 (SFO, worst-case from field studies, non-normalized, n = 6) *	11.0 (fast) 346.6 (slow) (DFOP[b)], worst-case from field studies (28.1), non-normalized, n = 4) **	Yes * EFSA (2018) ** CRD (2014)

DAT = days after treatment
a Not relevant for parent substance
b Corresponding DFOP parameters: k_1 of 0.0632d^{-1}, k_2 of 0.002 d^{-1} and g of 0.5732

Table 8.7-3: PEC_{soil} for mefentrifluconazole following application of 2 x 100 g a.s./ha to cereals

PEC_{soil} [mg/kg]		**Multiple applications**	
		Cereals	
		Actual	**TWA**
Initial		0.053	-
Short term	24h	0.053	0.053
	2d	0.053	0.053
	4d	0.053	0.053
Long term	7d	0.053	0.053
	14d	0.052	0.053
	21d	0.052	0.053
	28d	0.052	0.052
	50d	0.051	0.052
	100d	0.049	0.051
Plateau concentration (20 cm) after 10 years		~~0.152~~ 0.039	
$PEC_{accumulation}$ (PEC_{act} + $PEC_{soil\ plateau}$)		~~0.205~~ 0.092	

PEC_{soil} of metabolite

Only global maximum values are reported, which can be considered as worst-case estimates of short-term and long-term exposure.

Table 8.7-4: PEC_{soil} for metabolite 1,2,4-triazole following application of 2 x 100 g a.s./ha to cereals

PEC_{soil} [mg/kg]	**Multiple applications**
	Cereals
Initial	<0.001
Plateau concentration (20 cm) after 10 years	<0.001
$PEC_{accumulation}$ (PEC_{act} + $PEC_{soil\ plateau}$)	<0.001

8.7.2.2 Metrafenone and its metabolites

Comments of zRMS:	The submitted calculations report was accepted. The endpoints agreed at the EU level were used in PECsoil assessment. The calculations were performed in accordance with FOCUS guidance.

Reference:	CP 9.1.3/2
Report	Predicted environmental concentrations of BAS 560 F - metrafenone and its metabolites in soil and groundwater following application to spring and winter cereals in Europe, Liebisch O., 2022 report No 2621 DocID 2022/2003534 Authority registration No
Guideline(s):	FOCUS Kinetics (2006) SANCO/10058/2005 v 2.0 FOCUS (2014) Generic guidance for FOCUS Kinetics, v 1.1 FOCUS Groundwater (2000) Sanco/321/2000 FOCUS Groundwater (2009) Sanco/13144/2010 v3 of 2014 FOCUS Groundwater (2021) GG for Tier 1 GW Assessments, v2.3
Deviations:	No
GLP:	No, not compulsory to PEC reports
Acceptability:	Yes

For the modelling of the decline of metrafenone residues in soil the maximum laboratory aerobic soil DT_{50} of 365 days was considered (see Table 8.7-5).

Table 8.7-5: Input parameters for metrafenone and its metabolite for PEC_{soil} calculations

Compound	Metrafenone	CL377160	Value in accordance to EU endpoint y/n Reference
Molecular weight [g/mol]	409.27	395.3	Yes EFSA (2006)
Max. occurrence [%]	- [a]	18.9 (DAT 14, laboratory, soil photolysis)	Yes EFSA (2006)
DT_{50} [d]	365 (worst-case, laboratory studies)	7 (worst-case)	Yes EFSA (2006)

DAT = days after treatment
a) Not relevant for parent substance

Table 8.7-6: PEC_{soil} for metrafenone following application of 2 x 150 g a.s./ha to cereals

PEC_{soil} [mg/kg]		**Multiple applications**	
		Cereals	
		Actual	**TWA**
Initial		0.079	-
Short term	24h	0.079	0.079
	2d	0.079	0.079
	4d	0.078	0.079
Long term	7d	0.078	0.078
	14d	0.077	0.078
	21d	0.076	0.077
	28d	0.075	0.077
	50d	0.072	0.075
	100d	0.065	0.072
Plateau concentration (20 cm) after 10 years		~~0.079~~ 0.020	
$PEC_{accumulation}$ (PEC_{act} + $PEC_{soil\ plateau}$)		~~0.158~~ 0.099	

PEC_{soil} of metabolite

Only global maximum values are reported, which can be considered as worst-case estimates of short-term and long-term exposure.

Table 8.7-7: PEC_{soil} for metabolite CL377160 following application of 2 x 150 g a.s./ha to cereals

PEC_{soil} [mg/kg]	**Multiple applications**
	Cereals
Initial	<0.001

8.7.2.3 Pyraclostrobin and its metabolites

Reference:	CP 9.1.3/3
Report	Predicted environmental concentrations of BAS 500 F - pyraclostrobin and its metabolites in soil and groundwater following application to spring and winter cereals in Europe, Liebisch O., 2021 report No 2584 DocID 2021/2040765 Authority registration No
Guideline(s):	FOCUS Kinetics (2006) SANCO/10058/2005 v 2.0 FOCUS (2014) Generic guidance for FOCUS Kinetics, v 1.1 FOCUS Groundwater (2000) Sanco/321/2000 FOCUS Groundwater (2009) Sanco/13144/2010 v3 of 2014 FOCUS Groundwater (2021) GG for Tier 1 FOCUS GW Assessments, v 2.3
Deviations:	No
GLP:	No, not compulsory to PEC reports
Acceptability:	Yes

Table 8.7-8: Input parameters for pyraclostrobin and its metabolites for PEC_{soil} calculations

Compound	Pyraclostrobin	BF 500-6	BF 500-7	Value in accordance to EU endpoint y/n Reference
Molecular weight [g/mol]	387.8	305.75 [b)]	297.75 [b)]	Yes Monograph 12945/ ECCO/BBA/01
Max. occurrence [%]	- [a)]	30.9 (DAT 120, laboratory dark aerobic conditions	12.5 (DAT 62, laboratory dark aerobic conditions)	Yes Monograph 12945/ ECCO/BBA/01
DT_{50} [d]	55 37[c)] (SFO, worst-case, non-normalized, from field studies, n = 6)	1000 (default)	1000 (default)	Yes Monograph 12945/ ECCO/BBA/01

DAT = days after treatment
a) Not relevant for parent substance
b) Considering a factor of 0.5 to molecular weights of metabolites BF 500-6 and BF 500-7 since both metabolites are dimers (2 parent molecules required to form BF 500-6 and BF 500-7).
c) worst-case field DT50 of 37 days, as listed in the monograph 12945/ECCO/BBA/01; field DT50 values in the EU Review Report on pyraclostrobin (SANCO/1420/2001; page 12) are erroneously listed

Table 8.7-9: PEC_{soil} for pyraclostrobin following application of 2 x 120 g a.s./ha to cereals

PEC_{soil} [mg/kg]		Multiple applications	
		Cereals	
		Actual	TWA
Initial		0.059 (0.057[b])	-
Short term	24h	0.058 (0.056 [b])	0.058 (0.056 [b])
	2d	0.057 (0.055 [b])	0.058 (0.056 [b])
	4d	0.056 (0.053 [b])	0.057 (0.055 [b])
Long term	7d	0.054 (0.050 [b])	0.056 (0.053 [b])
	14d	0.049 (0.044 [b])	0.054 (0.050 [b])
	21d	0.045 (0.038 [b])	0.052 (0.047 [b])
	28d	0.041 (0.034 [b])	0.050 (0.044 [b])
	50d	0.031 (0.022 [b])	0.044 (0.038 [b])
	100d	0.017 (0.009 [b])	0.035 (0.028 [b])
Plateau concentration (20 cm) after 10 years		- [a]	
$PEC_{accumulation}$ (PEC_{act} + $PEC_{soil\ plateau}$)		- [a]	

[a] Not required as DT_{90} < 1 year
[b] worst-case field DT50 of 37 days, as listed in the monograph 12945/ECCO/BBA/01

PEC_{soil} of metabolites

Only global maximum values are reported, which can be considered as worst-case estimates of short-term and long-term exposure.

Table 8.7-10: PEC_{soil} for metabolite BF 500-6 following application of 2 x 120 g a.s./ha to cereals

PEC_{soil} [mg/kg]	Multiple applications
	Cereals
Initial	0.014
Plateau concentration (20 cm) after 10 years	0.051
$PEC_{accumulation}$ (PEC_{act} + $PEC_{soil\ plateau}$)	0.065

Table 8.7-11: PEC_{soil} for metabolite BF 500-7 following application of 2 x 120 g a.s./ha to cereals

PEC_{soil} [mg/kg]	Multiple applications
	Cereals
Initial	0.005
Plateau concentration (20 cm) after 10 years	0.020
$PEC_{accumulation}$ (PEC_{act} + $PEC_{soil\ plateau}$)	0.026

8.7.2.4 PEC_{soil} of formulation BAS 758 00 F

Maximum PEC_{soil} was calculated for the formulation BAS 758 00 F based on a worst-case scenario, which leads to the highest effective soil load of the formulation. A volumetric application rate of 1.5 L/ha for the use in cereals in combination with 80% interception corresponding to the earliest possible growth stage as proposed by the GAP (BBCH 30) was considered for the calculations. The $PEC_{soil,max}$ was calculated over 5 cm soil depth and assumed a soil bulk density of 1.5 g/cm^3.

Table 8.7-12: PEC_{soil} for BAS 758 00 F following application to cereals

Crop	Application rate of formulation [L/ha]	Formulation density [g/cm³]	Crop interception [%]	Effective soil load [g formulation/ha]	PEC_{ini} [mg formulation/kg] 5 cm soil depth
Cereals	1.5	1092	80	327.6	0.437

8.8 Predicted Environmental Concentrations in groundwater (PEC_{gw}) (KCP 9.2.4)

zRMS Comments:	The calculations submitted by Applicant were accepted. The calculations have been done according to FOCUS Groundwater guidelines. Models FOCUS-PEARL, FOCUS-PELMO and FOCUS MACRO have been used. All relevant metabolites and parameters have been taken according to List of Endpoints. The proposed pattern use in winter and spring cereals was considered. **Mefentrifluconazole**. The tiered approach was taken into consideration and accepted. For winter and spring cereals the PECgw values for active substance were below the trigger value of 0.1 µg/L. **1,2,4-triazole**. The PECgw values are below the trigger value 0.1 µg/L for spring and winter cereals. **Metrafenone** and its metabolite **CL377160.** The PECgw values are below the trigger value 0.1 µg/L for spring and winter cereals. **Pyraclostrobin** and metabolites **BF500-6 and BF500-7.** The PECgw values were below the trigger value of 0.1 µg/L for winter and spring cereals.

8.8.1 Justification for new endpoints

Mefentrifluconazole

No deviation from the EU-agreed endpoints [*EFSA Conclusion, 2018*].

Metrafenone

For $K_{f,oc}$ the geometric mean was used according to the latest FOCUS GW guidance [*FOCUS, 2021*]. All other endpoints were in accordance with the EU-agreed endpoints [*EFSA Conclusion, 2006*].

Pyraclostrobin

No deviation from the EU-agreed endpoints, apart from the exceptions given below.

A kinetic evaluation (including standardization to reference conditions) for the field DT_{50} values in soil (BASF DocID 2006/1007384, see Appendix 2) was considered for the PEC calculations. The geometric mean of the normalized values (20°C, pF 2) from field studies of 18 days was chosen for the calculations.

This endpoint for pyraclostrobin in the risk assessment therefore differs from the EU-agreed endpoint due to changes in evaluation guidelines (which type of DT_{50} to be used). In the annex I approval process Predicted Environmental Concentrations (PECs) were derived for groundwater (GW) according to the latest standards at that time (see monograph 12945/ECCO/BBA/01), i.e. PEC_{gw} was estimated using a worst-case $DT50_{soil}$ (non-normalized) from laboratory data (DT_{50} = 100 days); field data were submitted but were not used for the evaluation.

Today, the exposure assessment in groundwater requires a normalized (20°C, pF2) DT_{50} in soil. To fulfill this requirement, normalized laboratory or field soil DT_{50} values are needed. As field data are available and show significant faster degradation as compared to laboratory data, field data were normalized to derive the required DT_{50} in soil to be used in the required FOCUS models. This normalization study was performed in 2006. It was submitted, evaluated and accepted in the zonal process before so that a reference to this study would suffice, without re-evaluation.

Regarding metabolites BF 500-6 and BF 500-7, worst-case default DT_{50} values of 1000 days were used in contradiction to the laboratory values listed in the monograph.

The single sorption parameter values considered for the calculations were taken from the monograph 12945/ECCO/BBA/01 of pyraclostrobin. Following the current EU guidance [*EFSA (2014): EFSA Guidance Document for evaluating laboratory and field dissipation studies to obtain DegT50 values of active substances of plant protection products and transformation products of these active substances in soil. EFSA Journal 2014;12(5):3362*], the geometric mean of the sorption coefficient ($K_{f,oc}$) values for parent and metabolites were considered in the assessment.

8.8.2 Active substance(s) and relevant metabolite(s) (KCP 9.2.4.1)

Table 8.8-1: Input parameters related to application for PEC_{gw} calculations

Use No.	**1-15**		
FOCUS Crop	**Spring cereals and winter cereals**		
BBCH stage	30 – 59	30 – 59	30 – 59
Application rate [g a.s./ha]			
Mefentrifluconazole	100	100	67
Metrafenone	150	150	100
Pyraclostrobin	120	120	80
Number of applications / interval [d]	1 / -	2 / 14	2 / 14
Crop interception (%)	80	80	80
Frequency of application	Annual	Annual	Annual
Models used for calculation	FOCUS PEARL v5.5.5, FOCUS PELMO v6.6.4, FOCUS MACRO v5.5.4		

Table 8.8-2: Application dates used for groundwater risk assessment

Crop	**FOCUS Scenario**	**Application dates (absolute)**	
		1st application	**2nd application**
Spring cereals, BBCH 30	Châteaudun	16th April (106) [a]	30th April (120) [a]
	Hamburg	28th April	12th May
	Jokioinen	05th June	19th June
	Kremsmünster	27 th April	11th May
	Okehampton	22ndApril	06th May
	Porto	16th April	30th April
Winter cereals, BBCH 30	Châteaudun	15th April (105) [a]	29th April (119) [a]
	Hamburg	04th May	18th May
	Jokioinen	14th May	28th May
	Kremsmünster	24th April	08th May
	Okehampton	21st April	05th May
	Piacenza	19th March	02nd April
	Porto	30th January	13rd February
	Sevilla	06th January	20th January
	Thiva	18th January	01st February

[a] Julian day for FOCUS-MACRO calculations

8.8.2.1 Mefentrifluconazole and its metabolites

Comments of zRMS:	The submitted calculations report was accepted. For PECgw assessment the used endpoints were agreed at the EU level. The calculations were performed in accordance with FOCUS groundwater guidance. The tiered approach was considered: • Tier 1: At tier 1, the formation fraction was set to 1 and the geometric mean of slow phase DT50 values was used; • Tier 2: the observed biphasic degradation of 1,2,4-triazole (DFOP kinetics) was implemented as recommended by FOCUS [2014]. A worst-case formation fraction for the fast phase of 0.489 and for the slow phase of 0.511 was used; • Tier 3: the observed biphasic degradation of 1,2,4-triazole (DFOP kinetics) was implemented. A formation fraction for the fast phase of 0.318 and for the slow phase of 0.332 was used; • Tier 4: the observed biphasic degradation of 1,2,4-triazole (DFOP kinetics) was implemented. A formation fraction for the fast phase of 0.196 and for the slow phase of 0.204 was used.

Reference:	CP 9.2.4.1/1
Report	Predicted environmental concentrations of BAS 750 F - mefentrifluconazole and its metabolites in soil and groundwater following application to spring and winter cereals in Europe, Liebisch O., 2021 report No 2599 DocID 2021/2040773 Authority registration No
Guideline(s):	FOCUS Kinetics (2006) SANCO/10058/2005 v 2.0 FOCUS (2014) Generic guidance for FOCUS Kinetics, v 1.1 FOCUS Groundwater (2000) Sanco/321/2000 FOCUS Groundwater (2009) Sanco/13144/2010 v3 of 2014 FOCUS Groundwater (2021) GG for Tier 1 GW Assessments, v2.3
Deviations:	No
GLP:	No, not compulsory to PEC reports
Acceptability:	Yes

The leaching assessment was conducted during the EU evaluation of mefentrifluconazole at four Tiers, in that the formation and degradation of 1,2,4-triazole was considered at different levels of complexity. In the EFSA conclusions only Tier 4 calculations were summarized. However, the results indicate that the Tier 2 calculations (biphasic behaviour considered) are sufficient to indicate that risk of groundwater contamination of BAS 750 F and 1,2,4- triazole from the proposed use of BAS 750 01 F is unlikely.

Tier 1 calculations were based on a single-compartment degradation model for 1,2,4 triazole. For Tier 2 PEC_{gw} calculations, the observed biphasic degradation (DFOP kinetics) of 1,2,4-triazole was implemented. Parameters and procedures for mefentrifluconazole and for 1,2,4-triazole are identical with the corresponding ones in the EU evaluation.

For calculations with FOCUS-PEARL and FOCUS-PELMO, the parent substance and the metabolite were considered together in one model run. For the FOCUS-MACRO calculations, the metabolite was calculated as “parent equivalent”, i.e. the application rate of the parent was corrected, taking into account the molar correction factor and the formation fraction of the metabolite in soil.

In order to minimize the influence of non-linear sorption for the metabolite, the amount of active substance applied was doubled and the predicted concentrations of parent and metabolite in the leachate were divided by 2.

Table 8.8-3: Input parameters for mefentrifluconazole and its metabolite for PEC_{gw} calculations

Compound	**Mefentrifluconazole**	**1,2,4-triazole**		**Value in accordance to EU endpoint y/n Reference**
Molecular weight [g/mol]	397.8	69.1		Yes EFSA (2018)
Water solubility [mg/L] (20°C)	0.81	7.00×10^{5}		Yes EFSA (2018)
Saturated vapor pressure [Pa] (20°C)	3.2×10^{-6}	0.22		Yes EFSA (2018)
$DT_{50,soil}$ [d]	200 (geometric mean of field studies, normalized, n = 6)	fast phase DFOP: 1.68 (geometric mean of field studies, normalized, n = 4) slow phase DFOP: 60.5 (geometric mean of field studies, normalized, n = 4) g (proportion of the fast pool): 0.489 (arithmetic mean, n = 4)		Yes EFSA (2018)
Formation fraction [-] from parent	- [a)]	Tier 1: 1 Tier 2: 1 Tier 3: 0.65 Tier 4: 0.40		Yes EFSA (2018)
Formation fraction in PEARL [-]	- [a)]	For fast phase: Tier 1: - Tier 2: 0.489 Tier 3: 0.318 Tier 4: 0.196	For slow phase: Tier 1: 1.000 Tier 2: 0.511 Tier 3: 0.332 Tier 4: 0.204	Yes EFSA (2018)
Formation fraction in PELMO [-]	Tier 1: To 1,2,4-triazole: 0.0034657 Tier 2: To 1,2,4-triazole (fast phase): 0.0016947 To 1,2,4-triazole (slow phase): 0.0017710 Tier 3: To 1,2,4-triazole (fast phase): 0.00110158 To 1,2,4-triazole (slow phase): 0.00115114 Tier 4: To 1,2,4-triazole (fast phase): 0.00067790 To 1,2,4-triazole (slow phase): 0.00070840	Tier 1: To sink: 0.011457 Tier 2-4: To sink (fast phase): 0.412588 To sink (slow phase): 0.011457		Yes EFSA (2018)
Conversion factor for MACRO	-	Calculated as parent	Calculated as parent	Yes EFSA (2018)

Compound	Mefentrifluconazole	1,2,4-triazole	Value in accordance to EU endpoint y/n Reference
$K_{f,oc}$ [mL/g]	3455.6 (geometric mean; n = 8)	83 (geometric mean; n = 4)	Yes EFSA (2018)
$K_{f,om}$ [mL/g]	2004.4 (geometric mean; n = 8)	48 (geometric mean; n = 4)	Calculated from K_{foc} (K_{fom} = K_{foc} / 1.724
Freundlich exponent 1/n	0.975 (arithmetic mean; n = 8)	0.916 (arithmetic mean; n = 4)	Yes EFSA (2018)
Plant uptake [-]	0	0	Yes EFSA (2018)

a) Not relevant for parent substance

Table 8.8-4: PEC$_{gw}$ for mefentrifluconazole on spring and winter cereals – single and twofold application with FOCUS PEARL 5.5.5

FOCUS Scenario	80th Percentile PEC$_{gw}$ at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Hamburg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Jokioinen	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Kremsmünster	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Okehampton	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Piacenza	-	-	-	< 0.001	< 0.001	< 0.001
Porto	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	< 0.001	< 0.001	< 0.001

Table 8.8-5: PEC$_{gw}$ for mefentrifluconazole on spring and winter cereals – single and twofold application with FOCUS PELMO 6.6.4

FOCUS Scenario	80th Percentile PEC$_{gw}$ at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Hamburg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Jokioinen	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Kremsmünster	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Okehampton	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Piacenza	-	-	-	< 0.001	< 0.001	< 0.001
Porto	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	< 0.001	< 0.001	< 0.001

Table 8.8-6: PEC_{gw} for mefentrifluconazole on spring and winter cereals – single and twofold application with FOCUS MACRO 5.5.4

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Metabolites of mefentrifluconazole – Tier 1 – 4

Table 8.8-7: PEC_{gw} for 1,2,4-triazole (Tier 1) with FOCUS PEARL 5.5.5 – Spring and winter cereals, single and twofold application of mefentrifluconazole

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha
Châteaudun	0.005	0.004	0.009	0.007	0.004	0.011
Hamburg	0.040	0.028	0.066	0.035	0.025	0.058
Jokioinen	0.011	0.007	0.019	0.011	0.008	0.020
Kremsmünster	0.025	0.017	0.041	0.024	0.016	0.040
Okehampton	0.034	0.023	0.055	0.036	0.025	0.058
Piacenza	-	-	-	0.020	0.014	0.032
Porto	0.020	0.014	0.033	0.018	0.012	0.031
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	0.004	0.002	0.007

Table 8.8-8: PEC_{gw} for 1,2,4-triazole (Tier 1) with FOCUS PELMO 6.6.4 – Spring and winter cereals, single and twofold application of mefentrifluconazole

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha
Châteaudun	0.003	0.002	0.005	0.004	0.003	0.008
Hamburg	0.035	0.024	0.059	0.032	0.022	0.053
Jokioinen	0.011	0.007	0.018	0.012	0.008	0.020
Kremsmünster	0.023	0.015	0.038	0.022	0.015	0.037
Okehampton	0.031	0.022	0.051	0.033	0.023	0.053
Piacenza	-	-	-	0.021	0.015	0.035
Porto	0.027	0.019	0.045	0.032	0.022	0.052
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	0.002	0.001	0.003

Table 8.8-9: PEC_{gw} for 1,2,4-triazole (Tier 2) with FOCUS PEARL 5.5.5 – Spring and winter cereals, single and twofold application of mefentrifluconazole

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha
Châteaudun	0.003	0.002	0.005	0.004	0.002	0.006
Hamburg	0.021	0.015	0.034	0.018	0.013	0.030
Jokioinen	0.006	0.004	0.010	0.006	0.004	0.010
Kremsmünster	0.013	0.009	0.021	0.012	0.009	0.021
Okehampton	0.018	0.012	0.028	0.019	0.013	0.030
Piacenza	-	-	-	0.010	0.007	0.017
Porto	0.010	0.007	0.017	0.010	0.007	0.016
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	0.002	0.001	0.004

Table 8.8-10: PEC_{gw} for 1,2,4-triazole (Tier 2) with FOCUS PELMO 6.6.4 – Spring and winter cereals, single and twofold application of mefentrifluconazole

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha
Châteaudun	0.002	0.001	0.003	0.003	0.002	0.004
Hamburg	0.019	0.013	0.031	0.017	0.012	0.028
Jokioinen	0.006	0.004	0.010	0.006	0.004	0.011
Kremsmünster	0.012	0.008	0.020	0.012	0.008	0.019
Okehampton	0.016	0.011	0.027	0.017	0.012	0.028
Piacenza	-	-	-	0.011	0.008	0.018
Porto	0.014	0.010	0.023	0.017	0.011	0.027
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	0.001	0.001	0.002

Table 8.8-11: PEC_{gw} for 1,2,4-triazole (Tier 3) with FOCUS PEARL 5.5.5 – Spring and winter cereals, single and twofold application of mefentrifluconazole

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha
Châteaudun	0.001	0.001	0.003	0.002	0.001	0.003
Hamburg	0.012	0.009	0.020	0.011	0.008	0.018
Jokioinen	0.003	0.002	0.006	0.003	0.002	0.006
Kremsmünster	0.008	0.005	0.012	0.007	0.005	0.012
Okehampton	0.010	0.007	0.017	0.011	0.008	0.018
Piacenza	-	-	-	0.006	0.004	0.010
Porto	0.006	0.004	0.010	0.005	0.004	0.009
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	0.001	0.001	0.002

Table 8.8-12: PEC_{gw} for 1,2,4-triazole (Tier 3) with FOCUS PELMO 6.6.4 – Spring and winter cereals, single and twofold application of mefentrifluconazole

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha
Châteaudun	0.001	0.001	0.002	0.001	0.001	0.002
Hamburg	0.010	0.007	0.017	0.009	0.007	0.016
Jokioinen	0.003	0.002	0.005	0.003	0.002	0.006
Kremsmünster	0.007	0.005	0.011	0.007	0.005	0.011
Okehampton	0.009	0.007	0.015	0.010	0.007	0.016
Piacenza	-	-	-	0.006	0.005	0.010
Porto	0.008	0.006	0.013	0.009	0.007	0.015
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	0.001	0.001	0.001

Table 8.8-13: PEC_{gw} for 1,2,4-triazole (Tier 4) with FOCUS PEARL 5.5.5 – Spring and winter cereals, single and twofold application of mefentrifluconazole

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha
Châteaudun	0.001	0.001	0.001	0.001	0.001	0.002
Hamburg	0.007	0.005	0.011	0.006	0.004	0.010
Jokioinen	0.002	0.001	0.003	0.002	0.001	0.003
Kremsmünster	0.004	0.003	0.007	0.004	0.003	0.007
Okehampton	0.006	0.004	0.009	0.006	0.004	0.010
Piacenza	-	-	-	0.004	0.003	0.006
Porto	0.003	0.002	0.006	0.003	0.002	0.005
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	0.001	0.001	0.001

Table 8.8-14: PEC_{gw} for 1,2,4-triazole (Tier 4) with FOCUS PELMO 6.6.4 – Spring and winter cereals, single and twofold application of mefentrifluconazole

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha
Châteaudun	0.001	0.001	0.001	0.001	0.001	0.001
Hamburg	0.006	0.004	0.010	0.005	0.004	0.009
Jokioinen	0.002	0.001	0.003	0.002	0.001	0.003
Kremsmünster	0.004	0.003	0.006	0.004	0.003	0.006
Okehampton	0.005	0.004	0.009	0.006	0.004	0.009
Piacenza	-	-	-	0.004	0.003	0.006
Porto	0.005	0.003	0.008	0.005	0.004	0.009
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	< 0.001	< 0.001	0.001

Table 8.8-15: PEC_{gw} for 1,2,4-triazole with FOCUS MACRO 5.5.4 – Spring and winter cereals, single and twofold application of mefentrifluconazole

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha	2x67 g a.s./ha	1x100 g a.s./ha	2x100 g a.s./ha
Châteaudun Tier 1	0.008	0.005	0.014	0.008	0.005	0.014
Châteaudun Tier 2	0.003	0.002	0.005	0.003	0.002	0.006
Châteaudun Tier 3	0.002	0.001	0.003	0.002	0.001	0.003
Châteaudun Tier 4	0.001	0.001	0.002	0.001	0.001	0.002

The 80th percentiles of the predicted annual leachate concentrations of mefentrifluconazole were clearly below 0.1 µg/L in all tested scenarios. PEC_{gw} for the metabolite 1,2,4-triazole were all below 0.1 µg/L. Highest observed PEC for 1,2,4-triazole was documented for scenario Hamburg after application of 2×100 g a.s./ha on spring cereals (Tier 1; 0.097 µg/L).

Hence, the leaching of unacceptable amounts of the parent substance or the metabolite following application of mefentrifluconazole to the crops intended in the GAP is unlikely.

8.8.2.2 Metrafenone and its metabolites

Comments of zRMS:	The submitted calculations report was accepted. For PECgw assessment the used endpoints were agreed at the EU level. The calculations were performed in accordance with FOCUS groundwater guidance.

Reference: CP 9.2.4.1/2

Report: Predicted environmental concentrations of BAS 560 F - metrafenone and its metabolites in soil and groundwater following application to spring and winter cereals in Europe,

Liebisch O., 2022
CALC-2621
DocID 2022/2003534
Authority registration No

Guideline(s): FOCUS Kinetics (2006) SANCO/10058/2005 v 2.0
FOCUS (2014) Generic guidance for FOCUS Kinetics, v 1.1
FOCUS Groundwater (2000) Sanco/321/2000
FOCUS Groundwater (2009) Sanco/13144/2010 v3 of 2014
FOCUS Groundwater (2021) GG for Tier 1 FOCUS GW Assessments, v 2.3

Deviations: No

GLP: No, not compulsory to PEC reports

Acceptability: Yes

Table 8.8-16: Input parameters for metrafenone and its metabolite for PEC_{gw} calculations

Compound	**Metrafenone**	**CL377160**	**Value in accordance to EU endpoint y/n** **Reference**
Molecular weight [g/mol]	409.27	395.30	Yes EFSA (2006)
Water solubility [mg/L] (20°C)	0.550	0.593	Yes EFSA (2006)
Saturated vapor pressure [Pa] (20°C)	1.53×10^{-4}	6.95×10^{-8}	Yes EFSA (2006)
$DT_{50,soil}$ [d]	250.6 (geometric mean, laboratory studies, normalized, n=5)	7.0 (worst-case)	Yes EFSA (2006)
Formation fraction [-] from parent	- [a)]	Calculated as parent [b)]	Conservative assumption
$K_{f,oc}$ [mL/g]	2816 (geometric mean, n=5)	4061 (geometric mean, n=5)	Yes EFSA (2006)
$K_{f,om}$ [mL/g]	1631.1	2355.56	Calculated from K_{foc} ($K_{fom} = K_{foc} / 1.724$)
Freundlich exponent 1/n [-]	0.910 (arithmetic mean; n=5)	1.014 (arithmetic mean; n=5)	Yes EFSA (2006)
Plant uptake [-]	0	0	Conservative assumption

a) Not relevant for parent substance
b) As metabolite CL377160 was found in a soil photolysis study of metrafenone, there is no formation fraction for this metabolite. The application rate (AR) was separately calculated considering molar mass (MM) difference and the maximum

occurrence of 18.9% found in soil (MO), i.e.: $AR_{met}=AR_{parent}$ x (MM_{met} / MM_{parent}) x MO / 100

Table 8.8-17: PEC_{gw} for metrafenone on spring and winter cereals, single and twofold application with FOCUS PEARL 5.5.5

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x100 g a.s./ha	1x150 g a.s./ha	2x150 g a.s./ha	2x100 g a.s./ha	1x150 g a.s./ha	2x150 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Hamburg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Jokioinen	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Kremsmünster	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Okehampton	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Piacenza	-	-	-	< 0.001	< 0.001	< 0.001
Porto	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	< 0.001	< 0.001	< 0.001

Table 8.8-18: PEC_{gw} for metrafenone on spring and winter cereals, single and twofold application with FOCUS PELMO 6.6.4

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x100 g a.s./ha	1x150 g a.s./ha	2x150 g a.s./ha	2x100 g a.s./ha	1x150 g a.s./ha	2x150 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Hamburg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Jokioinen	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Kremsmünster	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Okehampton	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Piacenza	-	-	-	< 0.001	< 0.001	< 0.001
Porto	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	< 0.001	< 0.001	< 0.001

Table 8.8-19: PEC_{gw} for metrafenone on spring and winter cereals, single and twofold application with FOCUS MACRO 5.5.4

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x100 g a.s./ha	1x150 g a.s./ha	2x150 g a.s./ha	2x100 g a.s./ha	1x150 g a.s./ha	2x150 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

PEC_{gw} for metabolites of metrafenone

Table 8.8-20: PEC_{gw} for CL377160 with FOCUS PEARL 5.5.5 – Spring and winter cereals, single and twofold application of metrafenone

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x100 g a.s./ha	1x150 g a.s./ha	2x150 g a.s./ha	2x100 g a.s./ha	1x150 g a.s./ha	2x150 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Hamburg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Jokioinen	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Kremsmünster	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Okehampton	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Piacenza	-	-	-	< 0.001	< 0.001	< 0.001
Porto	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	< 0.001	< 0.001	< 0.001

Table 8.8-21: PEC_{gw} for CL377160 with FOCUS PELMO 6.6.4 – Spring and winter cereals, single and twofold application of metrafenone

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x100 g a.s./ha	1x150 g a.s./ha	2x150 g a.s./ha	2x100 g a.s./ha	1x150 g a.s./ha	2x150 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Hamburg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Jokioinen	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Kremsmünster	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Okehampton	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Piacenza	-	-	-	< 0.001	< 0.001	< 0.001
Porto	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	< 0.001	< 0.001	< 0.001

Table 8.8-22: PEC_{gw} for CL377160 with FOCUS MACRO 5.5.4 – Spring and winter cereals, single and twofold application of metrafenone

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x100 g a.s./ha	1x150 g a.s./ha	2x150 g a.s./ha	2x100 g a.s./ha	1x150 g a.s./ha	2x150 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

All simulations for all scenarios showed that the 80th percentiles of the predicted annual leachate concentrations of metrafenone and its metabolite CL377160 were below 0.001 µg/L. Therefore, the leaching of unacceptable amounts of metrafenone or its metabolite after the intended applications to spring and winter cereals is unlikely.

8.8.2.3 Pyraclostrobin and its metabolites

Comments of zRMS:	The submitted calculations report was accepted. For PECgw assessment the used endpoints were agreed at the EU level. The calculations were performed in accordance with FOCUS groundwater guidance.

Reference:	CP 9.2.4.1/3
Report	Predicted environmental concentrations of BAS 500 F - pyraclostrobin and its metabolites in soil and groundwater following application to spring and winter cereals in Europe, Liebisch O., 2021 CALC-2584 DocID 2021/2040765 Authority registration No
Guideline(s):	FOCUS Kinetics (2006) SANCO/10058/2005 v 2.0 FOCUS (2014) Generic guidance for FOCUS Kinetics, v 1.1 FOCUS Groundwater (2021) Sanco/321/2000 v2.3 FOCUS Groundwater (2009) Sanco/13144/2010 v3 of 2014 FOCUS Groundwater (2014) GG for Tier 1 FOCUS GW Assessments, v 2.2
Deviations:	No
GLP:	No, not compulsory to PEC reports
Acceptability:	Yes

Table 8.8-23: Input parameters for pyraclostrobin and its metabolites for PEC_{gw} calculations

Compound	**Pyraclostrobin**	**BF 500-6**	**BF 500-7**	**Value in accordance to EU endpoint y/n Reference**
Molecular weight [g/mol]	387.8	305.8 [a)]	297.8 [a)]	Yes Monograph 12945/ ECCO/BBA/01
Water solubility [mg/L] (20°C)	1.90	0.003	0.005	Yes Monograph 12945/ ECCO/BBA/01
Saturated vapor pressure [Pa] (20°C)	2.6 x 10^{-8}	1.0 x 10^{-10}	1.0 x 10^{-10}	Yes Monograph 12945/ ECCO/BBA/01
$DT_{50,soil}$ [d]	*18 (geometric mean of field studies, normalized, n = 4)	**1000 (default)	**1000 (default)	*No see Appendix 2 (BASF DocID 2006/1007384) **No Worst-case assumption
Formation fraction (-) from parent	- [c)]	1	1	No, worst-case assumption
$K_{f,oc}$ [mL/g]	8856 (geometric mean; n = 6)	26919 (geometric mean; n = 6)	33776 (geometric mean; n = 6)	Yes (single values) [b)] Monograph 12945/ ECCO/BBA/01
$K_{f,om}$ [mL g^{-1}]	5137	15614	19592	Calculated from K_{foc} ($K_{fom} = K_{foc}$ / 1.724)

Compound	Pyraclostrobin	BF 500-6	BF 500-7	Value in accordance to EU endpoint y/n Reference
Freundlich exponent 1/n [-]	*0.945 (arithmetic mean; n = 6)	**1 (default)	**1 (default)	*Yes Monograph 12945/ ECCO/BBA/01 **No Worst-case assumption
Plant uptake [-]	0	0	0	No: Worst-case assumption

a) Considering a factor of 0.5 to molecular weights of metabolites BF 500-6 and BF 500-7 since both metabolites are dimers (2 parent molecules required to form BF 500-6 and BF 500-7)

b) Following the current EU guidance [*EFSA (2014)*], the geometric mean of the sorption coefficient ($K_{f,oc}$) values were considered in the assessment

c) Not relevant for parent substance

Table 8.8-24: PEC_{gw} for pyraclostrobin on spring and winter cereals, single and twofold application with FOCUS PEARL 5.5.5

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Hamburg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Jokioinen	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Kremsmünster	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Okehampton	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Piacenza	-	-	-	< 0.001	< 0.001	< 0.001
Porto	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	< 0.001	< 0.001	< 0.001

Table 8.8-25: PEC_{gw} for pyraclostrobin on spring and winter cereals, single and twofold application with FOCUS PELMO 6.6.4

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Hamburg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Jokioinen	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Kremsmünster	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Okehampton	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Piacenza	-	-	-	< 0.001	< 0.001	< 0.001
Porto	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	< 0.001	< 0.001	< 0.001

Table 8.8-26: PEC_{gw} for pyraclostrobin on spring and winter cereals, single and twofold application with FOCUS MACRO 5.5.4

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

PEC_{gw} for metabolites of pyraclostrobin

Table 8.8-27: PEC_{gw} for BF 500-6 with FOCUS PEARL 5.5.5 – Spring and winter cereals, single and twofold application of pyraclostrobin

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Hamburg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Jokioinen	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Kremsmünster	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Okehampton	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Piacenza	-	-	-	< 0.001	< 0.001	< 0.001
Porto	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	< 0.001	< 0.001	< 0.001

Table 8.8-28: PEC_{gw} for BF 500-6 with FOCUS PELMO 6.6.4 – Spring and winter cereals, single and twofold application of pyraclostrobin

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Hamburg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Jokioinen	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Kremsmünster	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Okehampton	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Piacenza	-	-	-	< 0.001	< 0.001	< 0.001
Porto	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	< 0.001	< 0.001	< 0.001

Table 8.8-29: PEC_{gw} for BF 500-6 with FOCUS MACRO 5.5.4 – Spring and winter cereals, single and twofold application of pyraclostrobin

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Table 8.8-30: PEC_{gw} for BF 500-7 with FOCUS PEARL 5.5.5 – Spring and winter cereals, single and twofold application of pyraclostrobin

FOCUS Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Hamburg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Jokioinen	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Kremsmünster	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Okehampton	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Piacenza	-	-	-	< 0.001	< 0.001	< 0.001
Porto	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	< 0.001	< 0.001	< 0.001

Table 8.8-31: PEC$_{gw}$ for BF 500-7 with FOCUS PELMO 6.6.4 – Spring and winter cereals, single and twofold application of pyraclostrobin

FOCUS Scenario	80th Percentile PEC$_{gw}$ at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Hamburg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Jokioinen	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Kremsmünster	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Okehampton	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Piacenza	-	-	-	< 0.001	< 0.001	< 0.001
Porto	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sevilla	-	-	-	< 0.001	< 0.001	< 0.001
Thiva	-	-	-	< 0.001	< 0.001	< 0.001

Table 8.8-32: PEC$_{gw}$ for BF 500-7 with FOCUS MACRO 5.5.4 – Spring and winter cereals, single and twofold application

FOCUS Scenario	80th Percentile PEC$_{gw}$ at 1 m Soil Depth (µg/L)					
	Spring cereals			Winter cereals		
	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha	2x80 g a.s./ha	1x120 g a.s./ha	2x120 g a.s./ha
Châteaudun	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

All simulations for all scenarios showed that the 80th percentiles of the predicted annual leachate concentrations of pyraclostrobin and its two metabolites BF 500-6 and BF 500-7 were below 0.001 µg/L. Therefore, the leaching of unacceptable amounts of pyraclostrobin or its metabolites after the intended applications to spring and winter cereals is unlikely.

8.9 Predicted Environmental Concentrations in surface water (PEC_{sw}) (KCP 9.2.5)

zRMS Comments:	The $PEC_{SW/SED}$ assessment for active substances and their metabolites submitted by Applicant was accepted. The calculations have been done according to FOCUS Surface water guidelines. STEP 1 & 2 and STEP 3 and STEP 4 were used for PEC_{SW} and PEC_{SED} assessment. The following scenarios as relevant for Central zone were taken into consideration: D3, D4, D5, R1, R3 and R4. All parameters have been taken according to List of Endpoints. The proposed pattern uses and drift as an exposure route were considered: Mitigation measures have been proposed. **Mefentrifluconazole.** The Step 3 was used to assess the PECsw and PECsed in winter and spring cereals. The relevant metabolites were taken for consideration: 1,2,4-triazole, M750F003, M750F005, M750F006, M750F007 and M750F008. PECsw/sed values are presented in Tables 8.9-11. Taking into consideration the scenarios relevant for Central Zone – no mitigation measures were proposed. The worst case scenario PECsw in Step 3 are presented in the tables below.

Crop/Application pattern	max PECsw µg/L	max PECsed µg/kg
Winter cereals 1-2 x 67 g a.s./ha	0.551 R4 stream, multiple	1.513 R4 stream, multiple
Spring cereals 1-2 x 67 g a.s./ha	0.495 R4 stream, multiple	2.073 R4 stream, multiple

Crop/Application pattern	max PECsw µg/L	max PECsed µg/kg
Winter cereals 1 x 100 g a.s./ha	0.632 D3 ditch, single	1.009 R4 stream, single
Spring cereals 1 x 100 g a.s./ha	0.632 D3 ditch, single	1.510 R4 stream, single

Crop/Application pattern	max PECsw µg/L	max PECsed µg/kg
Winter cereals 1-2 x 100 g a.s./ha	0.827 D3 ditch, single	2.240 R4 stream, multiple
Spring cereals 1-2 x 100 g a.s./ha	0.742 R4 stream, multiple	3.057 R4 stream, multiple

For scenarios relevant for Poland and other MS, the D3, D4 and R1 scenarios were taken into consideration and max PECsw and PECsed are presented in the table below:

Crop/Application pattern	max PECsw µg/L	max PECsed µg/kg
Winter cereals 1-2 x 67 g a.s./ha	0.423 D3 ditch	1.408 R1 stream, multiple
Spring cereals 1-2 x 67 g a.s./ha	0.424 D3 ditch	1.527 R1 stream, multiple
Winter cereals 1 x 100 g a.s./ha	0.632 D3 ditch, single	0.696 R1 pond
Spring cereals 1 x 100 g a.s./ha	0.632 D3 ditch, single	1.463 R1 pond, single
Winter cereals 1-2 x 100 g a.s./ha	0.632 D3 ditch, single	2.087 R1 stream, multiple
Spring cereals 1-2 x 100 g a.s./ha	0.632 D3 ditch, single	2.643 R1 pond, single

Metrafenone. The Step 3 was used to assess the PECsw and PECsed in winter and spring cereals.

The worst case scenario PECsw in Step 3 are presented in the tables below.

Crop/Application pattern	max PECsw µg/L	max PECsed µg/kg
Winter cereals 1-2 x 100 g a.s./ha	0.732 R4 stream, multiple	1.758 R3 stream, multiple
Spring cereals 1-2 x 100 g a.s./ha	0.663 R4 stream, multiple	1.660 R4 stream, multiple

Crop/Application pattern	max PECsw µg/L	max PECsed µg/kg
Winter cereals 1 x 150 g a.s./ha	0.947 D3 ditch, single	1.203 R3 stream, single
Spring cereals 1 x 150 g a.s./ha	0.948 D3 ditch, single	2.153 R4 stream, single

Crop/Application pattern	max PECsw µg/L	max PECsed µg/kg
Winter cereals 2 x 150 g a.s./ha	1.127 R4 stream, multiple	2.606 R3 stream, multiple
Spring cereals 2 x 150 g a.s./ha	1.020 R4 stream, multiple	2.457 R4 stream, multiple

For scenarios relevant for Poland and other MS the D3, D4 and R1 scenarios were taken into consideration and max PECsw and PECsed are presented in the table below:

Crop/Application pattern	max PECsw µg/L	max PECsed µg/kg
Winter cereals 1-2 x 100 g a.s./ha	0.552 D3 ditch, single	1.526 R1 stream, multiple
Spring cereals 1-2 x 100 g a.s./ha	0.632 D3 ditch, single	1.493 R1 stream, multiple
Winter cereals 1 x 150 g a.s./ha	0.947 D3 ditch, single	0.816 R1 stream
Spring cereals	0.948	1.394

1 x 150 g a.s./ha	D3 ditch, single	R1 stream, single
Winter cereals 2 x 150 g a.s./ha	0.829 D3 ditch, single	2.240 R1 stream, multiple
Spring cereals 2 x 150 g a.s./ha	0.829 D3 ditch, single	2.187 R1 stream, single

Pyraclostrobin. The Step 3 and Step 4 were used to assess the PECsw and PECsed in winter and spring cereals. A wide range of mitigation measures were taken into consideration.

The relevant metabolite was taken for consideration: BF 500-11, BF 500-13, BF 500-14, BF 500-3, BF 500-6 and BF 500-7.

The D1, D2 and D6 scenarios are not relevant for Central Zone and were not considered.
Taking into consideration the scenarios relevant for Central Zone – the mitigation measure was proposed 5 m non-spray buffer zone or use of 50% nozzle reduction techniques.

The worst case scenario PECsw (Step 4: 5m NSS or 50% DRT) and PECsed (Step 3) are presented in the table below.

The worst case scenario PECsw in Step 4 are presented in the tables below.

Crop/Application pattern	Mitigation measure	max PECsw µg/L	Step 3 max PECsed µg/kg
Winter cereals 1-2 x 80 g a.s./ha	5 m NSS	0.299 R4 stream, multiple	4.006 R4 stream, multiple
	50% DRT	0.299 R4 stream, multiple	
Spring cereals 1-2 x 80 g a.s./ha	5 m NSS	0.295 R4 stream, multiple	3.346 R4 stream, multiple
	50% DRT	0.295 R4 stream, multiple	

Crop/Application pattern	Mitigation measure	max PECsw µg/L	Step 3 max PECsed µg/kg
Winter cereals 1 x 120 g a.s./ha	5 m NSS	0.254 R3 stream	2.296 R4 stream
	50% DRT	0.376 D3 ditch	
Spring cereals 1 x 120 g a.s./ha	5 m NSS	0.250 R4 stream	4.501 R4 stream
	50% DRT	0.377 D3 ditch	

Crop/Application pattern	Mitigation measure	max PECsw µg/L	Step 3 max PECsed µg/kg
Winter cereals 1-2 x 120 g a.s./ha	5 m NSS	0.458 R4 stream, multiple	5.934 R3, R4 stream, multiple
	50% DRT	0.458 R4 stream, multiple	
Spring cereals	5 m NSS	0.450	4.928

1-2 x 120 g a.s./ha		R4 stream, multiple	R4 stream, single
	50% DRT	0.450 R4 stream, multiple	

For scenarios relevant for Poland and other MS the D3, D4 and R1 scenarios were taken into consideration. Winter cereals was taken as a surrogate crop in R1 scenario for spring cereals. Max PECsw and PECsed are presented in the table below:

Crop/Application pattern	Mitigation measure	max PECsw µg/L	Step 3max PECsed µg/kg
Winter cereals 1-2 x 80 g a.s./ha	5 m NSS	0.171 R1 stream, multiple	3.010 R1 stream, multiple
	50% DRT	0.252 D3 ditch, single	
Spring cereals 1-2 x 80 g a.s./ha	5 m NSS	0.171 R1 stream, multiple	3.010 R1 stream, multiple
	50% DRT	0.251 D3 ditch, single	
Winter cereals 1 x 120 g a.s./ha	5 m NSS	0.204 D3 ditch	1.794 R1 stream
	50% DRT	0.376 D3 ditch	
Spring cereals 1 x 120 g a.s./ha	5 m NSS	0.225 D4 stream	1.794 R1 stream, single
	50% DRT	0.377 D3 ditch	
Winter cereals 1-2 x 120 g a.s./ha	5 m NSS	0.261 R1 stream, multiple	4.473 R4 stream, multiple
	50% DRT	0.376 D4 stream, single	
Spring cereals 1-2 x 120 g a.s./ha	5 m NSS	0.261 R1 stream, multiple	4.473 R1 stream, single
	50% DRT	0.377 D3 ditch, single	

Formulation. The PEC_{SW} assessment for formulation was submitted and accepted; the PECsw values were calculated using SWASH Drift calculator. The PECsw value for mitigation distance of 5 m was added. All PECsw values are presented below.

Crop	max Drift PECsw [µg/L]		
	1 m	**3 m**	**5 m**
Winter and Spring Cereals 1.5 L/ha	10.524	4.4554	2.8525

The mitigation measures of 5m NSB or use of 50% nozzle reduction techniques were proposed.

The relevant PECsw and PECsed will be used in risk assessment.

8.9.1 Justification for new endpoints

Mefentrifluconazole

At Steps 1-2 of the tiered assessment scheme, for mefentrifluconazole the whole system DT_{50} of 163.4 days was used both for the water and sediment compartment according to current FOCUS guideline [*FOCUS (2006,2014): Guidance Document on Estimating Persistence and Degradation Kinetics from Environmental Fate Studies on Pesticides in EU Registration. Report of the FOCUS Work Group on Degradation Kinetics, EC Document Reference Sanco/10058/2005 version 1.1 of December 2014, 440 pp*], whilst the List of Endpoints (DAR, 2018) gives a default of 1000 days for DT_{50} in sediment. However, resulting STEP 1-2 PEC_{sw} and PEC_{sed} values show only a minor difference from corresponding values in the DAR.

All other endpoints used for $PEC_{sw/sed}$ calculations for mefentrifluconazole and its metabolites were selected according to the EFSA Conclusion on the active substance [*EFSA Conclusion, 2018*].

Metrafenone

For $K_{f,oc}$ the geometric mean was used according to the latest FOCUS SW guidance [*FOCUS, 2015*]. All other endpoints were in accordance with the EU-agreed endpoints [*EFSA Conclusion, 2006*].

Pyraclostrobin

No deviation from the EU-agreed endpoints, apart from the exceptions given below.

A kinetic evaluation (including standardization to reference conditions) for the field DT_{50} values in soil (BASF DocID 2006/1007384, see Appendix 2) was considered for the PEC calculations. The geometric mean of the normalized values (20°C, pF 2) from field studies of 18 days was chosen for the calculations.

This endpoint for pyraclostrobin in the risk assessment therefore differs from the EU-agreed endpoint due to changes in evaluation guidelines (which type of DT_{50} to be used). In the annex I approval process Predicted Environmental Concentrations (PECs) were derived for groundwater (GW) according to the latest standards at that time (see monograph 12945/ECCO/BBA/01), i.e. PEC_{gw} was estimated using a worst-case $DT50_{soil}$ (non-normalized) from laboratory data (DT_{50} = 100 days); field data were submitted but were not used for the evaluation. PEC_{sw} was estimated using the entry pathway spray drift only, as no degradation data in soil was required at that time.

Today, the exposure assessment in surface water requires a normalized (20°C, pF2) DT_{50} in soil. To fulfill this requirement, normalized laboratory or field soil DT_{50} values are needed. As field data are available and show significant faster degradation as compared to laboratory data, field data were normalized to derive the required DT_{50} in soil to be used in the required FOCUS models. This normalization study was performed in 2006. It was submitted, evaluated and accepted in the zonal process before so that a reference to this study would suffice, without re-evaluation.

Additionally, metabolites BF 500-11, BF 500-13, BF 500-14 and BF 500-3 were found in an irradiated water/sediment study at levels exceeding 5%. DT_{50} values for water, sediment and whole system from a new kinetic evaluation (BASF DocID 2012/1021122, see Appendix 2) of the irradiated water/sediment study were therefore considered for calculating $PEC_{sw/sed}$ of pyraclostrobin metabolites BF 500-11, BF 500-14 and BF 500-3.

Regarding metabolites BF 500-6 and BF 500-7, worst-case default DT_{50} values (soil, sediment) of 1000 days were used as conservative approach and not the values listed in the monograph.

The single sorption parameter values considered for the calculations were taken from the monograph 12945/ECCO/BBA/01 of pyraclostrobin. Following the current EU guidance [*EFSA (2014): EFSA Guidance Document for evaluating laboratory and field dissipation studies to obtain DegT50 values of active substances of plant protection products and transformation products of these active substances in soil. EFSA Journal 2014;12(5):3362*], the geometric mean of the sorption coefficient ($K_{f,oc}$) values for parent and metabolites were considered in the assessment.

8.9.2 Active substance(s), relevant metabolite(s) and the formulation (KCP 9.2.5)

According to the Work sharing document of the Central zone [*CENTRAL ZONE (2018) Working document of the central zone in the authorisation of plant protection products. Section 8. Environmental fate and behaviour. Version 1 rev. 1 – June 2018*] the following surface water scenarios are relevant for the Central Zone: D3 Vredepeel, D4 Skousbo, D5 La Jailliere, R1 Weiherbach, R3 Bologna, R4 Roujan.

Table 8.9-1: Input parameters related to application for $PEC_{sw/sed}$ calculations for winter and spring cereals

Use No.	**1 - 15**		
FOCUS crop	**Spring and winter cereals a)**		
Crop growth stage (BBCH)	30 – 59	30 - 59	30 - 59
Application rate [g a.s./ha]			
Mefentrifluconazole	100	100	67*
Metrafenone	150	150	100
Pyraclostrobin	120**	120**	80**
Number of applications/ interval [d]	1 / -	2 / 14	2 / 14
Application window (relevant for STEPS 1-2 only)	Mar-May North Europe and South Europe Average crop cover		
Start date of application window (relevant for STEPS 3-4)	date at BBCH 30 in AppDate 3.06		
Application method	Ground spray	Ground spray	Ground spray
CAM (Chemical application method)	Foliar linear	Foliar linear	Foliar linear
Soil depth [cm]	4	4	4
Models used for calculation	STEPS 1-2 in FOCUS v3.2 FOCUS SPIN v3.3, FOCUS SWASH v5.3 (FOCUS PRZM v4.3.1, FOCUS MACRO v5.5.4, FOCUS TOXSWA v5.5.3), SWAN 5.0.1		

a) As national requirement for Austria, spring oil seed rape was used as surrogate crop for spring cereals for the Step 3 and Step 4 calculations (scenario R1), since the R1 scenario is not defined for this crop.
* Step 12 calculations were performed for an application rate of 2x 100 g/ha as risk envelope approach.
** For Step 12 calculations, a risk envelope approach of an application pattern of 2x150 g a.s./ha was used.

Table 8.9-2: FOCUS Step 3 and 4 scenario related input parameters for $PEC_{sw/sed}$ calculations

FOCUS crop	FOCUS Scenario	Time window start	Time window end
Spring cereals	D3	28th April	11th June (28th May [a])
	D4	18th May	1st July (17th June [a])
	D5	9th April	23rd May (9th May [a])
	R1 [b]	10th May	23rd June (9th June [a])
	R4	9th April	23rd May (9th May [a])
Winter cereals	D3	16th April	30th May (16th May [a])
	D4	18th March	01st May (17th April [a])
	D5	15th March	28th April (14th April [a])
	R1	24th April	7th June (24th May [a])
	R3	19th March	2nd May (18th April [a])
	R4	24th January	9th March (23rd February)

[a] End of application window for single application.
[b] This scenario is not defined for spring cereals. As surrogate spring oil seed rape was used.

Table 8.9-3: Default values for $PEC_{sw/sed}$ calculations at Steps 3 and 4

General			
Diffusion coefficient in water	TOXSWA (m^2/d) MACRO (m^2/s)	4.3 x 10^{-5} 5.0 x 10^{-10}	FOCUS recommendation
Diffusion coefficient in air	TOXSWA (m^2/d) PRZM (cm^2/d)	0.43 4300	FOCUS recommendation
Degradation parameter			
Reference temperature (°C)		20	FOCUS recommendation
Alpha factor (1/K)	MACRO	0.0948	FOCUS recommendation
Q_{10} (–)	PRZM	2.58	FOCUS recommendation
Reference moisture		pF 2	FOCUS recommendation
Moisture exponent	MACRO (–) PRZM (–)	0.49 0.7	FOCUS recommendation
DT_{50} on crop canopy (d)		10	FOCUS recommendation
Reference temperature (°C)		20	FOCUS recommendation
Activation energy (J/mol)	TOXSWA	65400	FOCUS recommendation
Crop related parameter			
Wash-off factor from crop	MACRO (1/mm) PRZM (1/cm)	0.05 0.50	FOCUS recommendation

8.9.2.1 Mefentrifluconazole and its metabolites

Reference:	CP 9.2.5/1
Report	Predicted environmental concentrations of BAS 750 F – mefentrifluconazole and its metabolites in surface water and sediment following application to spring and winter cereals in Europe, Liebisch O., 2021 CALC-2601 DocID 2021/2040776 Authority registration No
Guideline(s):	FOCUS Surface Water Scenarios (2001) SANCO/4802/2001 rev. 2, FOCUS Surface Water (2015) Generic guidance v 1.4, FOCUS (2007) Landscape and Mitigation factors in aquatic risk assessment, Vol. 1 and 2, BAES (2020): National exposure assessment for the authorization of plant protection products (PPP) in Austria, v4
Deviations:	No
GLP:	No, not compulsory to PEC reports
Acceptability:	Yes

Table 8.9-4: Input parameters for mefentrifluconazole and its metabolites for $PEC_{sw/sed}$ calculations

Compound	Mefentrifluconazole	1,2,4-triazole	M750F003	M750F005	M750F006	M750F007	M750F008	Value in accordance to EU endpoint Reference
Molecular weight [g mol^{-1}]	397.8	69.1	287.2	379.3	355.8	337.3	355.8	Yes, EFSA (2018)
Vapor pressure [Pa] (20°C)	3.2 x 10^{-6}	Not required for Step 1-2						Yes, EFSA (2018)
Water solubility [mg L^{-1}] (20°C)	0.81	700000	1000 (conservative estimate)	1000 (conservative estimate)	1000 (conservative estimate)	1000 (conservative estimate)	1000 (conservative estimate)	Yes, EFSA (2018)
DT_{50} soil [d]	200 (geometric mean of field trials, normalized, n = 6)	60.5 (geometric mean of field studies, slow phase DFOP, n = 4)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	Yes, EFSA (2018)
DT_{50} water [d]	1000 (default)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	Yes, EFSA (2018)
DT_{50} sediment [d]	163.4 (geometric mean, whole system level P-1, n = 2)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	EFSA (2018)
DT_{50} whole system [d]	163.4 (geometric mean, n = 2	1000 (default)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	Yes, EFSA (2018)
Max. occurrence observed [%]	- [b)]	Soil: 5.1 Total w/s system: 15.1	Soil: 1.8 Total w/s system: 8.5	Soil: 0.001 [c)] Photolysis study: 32.2	Soil: 0.001 [c)] Photolysis study: 30.7	Soil: 0.001 [c)] Photolysis study: 43.9	Soil: 0.001 [c)] Photolysis study: 7.3	EFSA (2018)

Compound	Mefentrifluconazole	1,2,4-triazole	M750F003	M750F005	M750F006	M750F007	M750F008	Value in accordance to EU endpoint Reference
$K_{f,oc}$ [mL g^{-1}]	3455.6 (geometric mean; n = 8)	83 (geometric mean; n = 4)	597.6 (QSAR estimate)	7863 (QSAR estimate)	4919 (QSAR estimate)	3938 (QSAR estimate)	17240 (QSAR estimate)	Yes, EFSA (2018)
Freundlich exponent 1/n	0.975 (arithmetic mean; n = 8)	Not required for Step 1-2						Yes, EFSA (2018)
Plant Uptake [-]	0	Not required for Step 1-2						Yes, EFSA (2018)

$PEC_{sw/sed}$ for mefentrifluconazole FOCUS STEPs 1-3

Global maximum PEC_{sw} and PEC_{sed} values are reported for winter and for spring cereals all scenarios. For actual and time-weighted average values of the PEC_{sw} for mefentrifluconazole please refer to the study report [BASF DocID 2021/2040776].

Table 8.9-5: FOCUS Steps 1, 2 and 3 PEC_{sw} and PEC_{sed} for mefentrifluconazole following single/twofold* application of 67 g a.s./ha to <u>spring cereals</u>

Scenario FOCUS	Waterbody / Season	Max. PEC_{sw} [µg/L]	Dominant entry route	21 d – $PEC_{sw,twa}$ [µg/L]	Max. PEC_{sed} [µg/kg]
Step 1					
-	-	13.728 multiple	-	11.725 multiple	420.381 multiple
Step 2					
Northern Europe	March-May	2.216 multiple	-	2.020 multiple	72.548 multiple
Southern Europe	March-May	4.048 multiple	-	3.772 multiple	135.574 multiple
Step 3					
D3	Ditch	0.424 single	Spray drift	0.041 multiple	0.345 multiple
D4	Pond	0.038 multiple	Drainage	0.031 multiple	0.351 multiple
	Stream	0.346 single	Spray drift	0.013 multiple	0.126 multiple
D5	Pond	0.021 multiple	Spray drift	0.018 multiple	0.205 multiple
	Stream	0.356 single	Spray drift	0.002 multiple	0.024 multiple
R1 **	Pond	0.109 multiple	Runoff	0.098 multiple	1.776 multiple
	Stream	0.387 multiple	Runoff	0.035 multiple	1.527 multiple
R4	Stream	0.495 multiple	Runoff	0.061 multiple	2.073 multiple

* The maximum value from either the single or multiple application is reported in the table.
** This scenario is not defined for spring cereals. As surrogate spring oil seed rape was used.

Table 8.9-6: FOCUS Steps 1, 2 and 3 PEC_{sw} and PEC_{sed} for mefentrifluconazole following single/twofold* application of 67 g a.s./ha to winter cereals

Scenario FOCUS	Waterbody / Season	Max. PEC_{sw} [µg/L]	Dominant entry route	21 d – $PEC_{sw,twa}$ [µg/L]	Max. PEC_{sed} [µg/kg]
Step 1					
-	-	13.728 multiple	-	11.725 multiple	420.381 multiple
Step 2					
Northern Europe	March-May	2.216 multiple	-	2.020 multiple	72.548 multiple
Southern Europe	March-May	4.048 multiple	-	3.772 multiple	135.574 multiple
Step 3					
D3	Ditch	0.423 single	Spray drift	0.038 multiple	0.327 multiple
D4	Pond	0.039 multiple	Drainage	0.032 multiple	0.347 multiple
	Stream	0.313 single	Spray drift	0.014 multiple	0.132 multiple
D5	Pond	0.023 multiple	Spray drift	0.020 multiple	0.211 multiple
	Stream	0.338 single	Spray drift	0.002 multiple	0.028 multiple
R1	Pond	0.079 multiple	Runoff	0.073 multiple	1.082 multiple
	Stream	0.393 multiple	Runoff	0.032 multiple	1.408 multiple
R3	Stream	0.392 single	Spray drift	0.028 multiple	1.292 multiple
R4	Stream	0.551 multiple	Runoff	0.049 multiple	1.513 multiple

* The maximum value from either the single or multiple application is reported in the table.

Table 8.9-7: FOCUS Step 3 PEC_{sw} and PEC_{sed} for mefentrifluconazole following single application of 100 g a. s./ha to spring cereals

Scenario FOCUS	Waterbody / Season	Max. PEC_{SW} [µg/L]	Dominant entry route	21 d – $PEC_{SW,twa}$ [µg/L]	Max. PEC_{SED} [µg/kg]
D3	Ditch	0.632	Spray drift	0.035	0.427
D4	Pond	0.030	Drainage	0.025	0.292
	Stream	0.517	Spray drift	0.010	0.098
D5	Pond	0.023	Spray drift	0.019	0.182
	Stream	0.531	Spray drift	0.001	0.024
R1**	Pond	0.086	Runoff	0.078	1.463
	Stream	0.415	Spray drift	0.029	1.230
R4	Stream	0.418	Spray drift	0.061	1.510

** This scenario is not defined for spring cereals. As surrogate spring oil seed rape was used.

Table 8.9-8: FOCUS Step 3 PEC_{sw} and PEC_{sed} for mefentrifluconazole following single application of 100 g a. s./ha to winter cereals

Scenario FOCUS	Waterbody / Season	Max. PEC_{SW} [µg/L]	Dominant entry route	21 d – $PEC_{SW,twa}$ [µg/L]	Max. PEC_{SED} [µg/kg]
D3	Ditch	0.632	Spray drift	0.031	0.390
D4	Pond	0.029	Drainage	0.024	0.271
	Stream	0.467	Spray drift	0.010	0.098
D5	Pond	0.023	Spray drift	0.019	0.184
	Stream	0.504	Spray drift	0.001	0.016
R1**	Pond	0.050	Runoff	0.046	0.696
	Stream	0.416	Spray drift	0.020	0.742
R3	Stream	0.585	Spray drift	0.021	0.926
R4	Stream	0.418	Spray drift	0.035	1.009

** This scenario is not defined for winter cereals. As surrogate spring oil seed rape was used.

Table 8.9-9: FOCUS Steps 1, 2 and 3 PEC_{sw} and PEC_{sed} for mefentrifluconazole following single/twofold* application of 100 g a. s./ha to spring cereals

Scenario FOCUS	Waterbody / Season	Max. PEC_{sw} [µg/L]	Dominant entry route	21 d – $PEC_{sw,twa}$ [µg/L]	Max. PEC_{sed} [µg/kg]
Step 1					
-	-	13.728 multiple	-	11.725 multiple	420.381 multiple
Step 2					
Northern Europe	March-May	2.216 multiple	-	2.020 multiple	72.548 multiple
Southern Europe	March-May	4.048 multiple	-	3.772 multiple	135.574 multiple
Step 3					
D3	Ditch	0.632 single	Spray drift	0.061 multiple	0.514 multiple
D4	Pond	0.057 multiple	Drainage	0.048 multiple	0.529 multiple
	Stream	0.517 single	Spray drift	0.020 multiple	0.191 multiple
D5	Pond	0.032 multiple	Spray drift	0.028 multiple	0.309 multiple
	Stream	0.531 single	Spray drift	0.002 multiple	0.036 multiple
R1 **	Pond	0.162 multiple	Runoff	0.147 multiple	2.643 multiple
	Stream	0.581 multiple	Runoff	0.052 multiple	2.269 multiple
R4	Stream	0.742 multiple	Runoff	0.091 multiple	3.057 multiple

* The maximum value from either the single or multiple application is reported in the table.
** This scenario is not defined for spring. As surrogate spring oil seed rape was used.

Table 8.9-10: FOCUS Steps 1, 2 and 3 PEC_{sw} and PEC_{sed} for mefentrifluconazole following single/twofold* application of 100 g a.s./ha to winter cereals

Scenario FOCUS	Waterbody / Season	Max. PEC_{sw} [µg/L]	Dominant entry route	21 d – $PEC_{sw,twa}$ [µg/L]	Max. PEC_{sed} [µg/kg]
Step 1					
-	-	13.728 multiple	-	11.725 multiple	420.381 multiple
Step 2					
Northern Europe	March-May	2.216 multiple	-	2.020 multiple	72.548 multiple
Southern Europe	March-May	4.048 multiple	-	3.772 multiple	135.574 multiple
Step 3					
D3	Ditch	0.632 Single	Spray drift	0.056 multiple	0.486 multiple
D4	Pond	0.059 multiple	Drainage	0.049 multiple	0.522 multiple
	Stream	0.467 single	Spray drift	0.021 multiple	0.200 multiple
D5	Pond	0.034 multiple	Spray drift	0.030 multiple	0.319 multiple
	Stream	0.504 single	Spray drift	0.003 multiple	0.041 multiple
R1	Pond	0.118 multiple	Runoff	0.109 multiple	1.612 multiple
	Stream	0.589 multiple	Runoff	0.048 multiple	2.087 multiple
R3	Stream	0.585 single	Spray drift	0.042 multiple	1.923 multiple
R4	Stream	0.827 multiple	Runoff	0.072 multiple	2.240 multiple

* The maximum value from either the single or multiple application is reported in the table.

Metabolites of mefentrifluconazole

Only maximum values are reported, which can also be considered as worst-case estimates of short-term and long-term exposure.

Table 8.9-11: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for the metabolites of mefentrifluconazole following single/twofold* application of mefentrifluconazole to winter and spring cereals (100 g a.s./ha)

Scenario FOCUS	Season	Max PEC_{sw} [µg/L]	Max PEC_{sed} [µg/kg]
1,2,4-triazole			
Step 1	-	2.154 multiple	1.783 multiple
Step 2			
Northern Europe	Mar-May	0.357 multiple	0.295 multiple
Southern Europe	Mar-May	0.675 multiple	0.559 multiple
M750F003			
Step 1	-	2.872 multiple	16.854 multiple
Step 2			
Northern Europe	Mar-May	0.492 multiple	2.881 multiple
Southern Europe	Mar-May	0.920 multiple	5.434 multiple
M750F005			
Step 1	-	2.347 multiple	143.931 multiple
Step 2			
Northern Europe	Mar-May	0.339 multiple	24.968 multiple
Southern Europe	Mar-May	0.613 multiple	46.547 multiple
M750F006			
Step 1	-	2.927 multiple	122.329 multiple
Step 2			
Northern Europe	Mar-May	0.457 multiple	21.220 multiple
Southern Europe	Mar-May	0.830 multiple	39.560 multiple

Scenario FOCUS	Season	Max PEC_{sw} [µg/L]	Max PEC_{sed} [µg/kg]
M750F007			
Step 1	-	4.655 multiple	160.566 multiple
Step 2			
Northern Europe	Mar-May	0.747 multiple	27.853 multiple
Southern Europe	Mar-May	1.358 multiple	51.926 multiple
M750F008			
Step 1	-	0.302 multiple	32.129 multiple
Step 2			
Northern Europe	Mar-May	0.060 single	5.573 multiple
Southern Europe	Mar-May	0.063 multiple	10.390 multiple

* The maximum value from either the single or multiple application is reported in the table.

8.9.2.2 Metrafenone and its metabolites

Reference:	CP 9.2.5/2
Report	Predicted environmental concentrations of BAS 560 F - metrafenone in surface water and sediment following application to spring and winter cereals in Europe, Liebisch O., 2022 CALC-2604 DocID 2021/2041362 Authority registration No
Guideline(s):	FOCUS Surface Water Scenarios (2001) SANCO/4802/2001 rev. 2, FOCUS Surface Water (2015) Generic guidance v 1.4, FOCUS (2007) Landscape and Mitigation factors in aquatic risk assessment, Vol. 1 and 2, BAES (2020): National exposure assessment for the authorization of plant protection products (PPP) in Austria, v4
Deviations:	No
GLP:	No, not compulsory to PEC reports
Acceptability:	Yes

Table 8.9-12: Input parameters for metrafenone for PEC_{sw} calculations

Compound	Metrafenone	Value in accordance to EU endpoint y/n Reference
Molecular weight [g/mol]	409.27	Yes EFSA (2006)
Water solubility [mg/L] (20°C)	0.550	Yes EFSA (2006)
Saturated vapor pressure [Pa] (20°C)	1.53×10^{-4}	Yes EFSA (2006)
$DT_{50,soil}$ [d]	250.6 (geometric mean, laboratory studies, normalized, n=5)	Yes EFSA (2006)
DT_{50} in water [d] – for Step 2	1000 (default)	Yes EFSA (2006)
DT_{50} in sediment [d] – for Step 2	9.3 (geometric mean, whole system DT_{50})	Yes EFSA (2006)
DT_{50} in the whole system [d]	9.3 (geometric mean)	Yes EFSA (2006)
$K_{f,oc}$ [mL/g]	2812 (geometric mean, n = 5)	Yes EFSA (2006)
Freundlich exponent 1/n (-)	0.91 (arithmetic mean, n = 5)	Yes EFSA (2006)
Plant uptake [-]	0	Conservative assumption

$PEC_{sw/sed}$ for metrafenone FOCUS STEPs 1-3

Table 8.9-13: FOCUS Steps 1, 2 and 3 PEC_{sw} and PEC_{sed} for metrafenone following single application of 100 g a.s./ha to <u>spring cereals</u>

Scenario FOCUS	Waterbody / Season	Max. PEC_{sw} [µg/L]	Dominant entry route	21 d – $PEC_{sw,twa}$ [µg/L]	Max. PEC_{sed} [µg/kg]
Step 1					
-	-	7.938	-	3.662	197.361
Step 2					
Northern Europe	March-May	1.346	-	0.775	35.158
Southern Europe	March-May	2.457	-	1.451	66.389
Step 3					
D3	Ditch	0.632	Spray drift	0.034	0.424
D4	Pond	0.030	Drainage	0.023	0.173
	Stream	0.516	Spray drift	0.011	0.122
D5	Pond	0.022	Spray drift	0.017	0.113
	Stream	0.530	Spray drift	0.001	0.023
R1**	Pond	0.049	Runoff	0.042	0.460
	Stream	0.415	Spray drift	0.025	0.949
R4	Stream	0.417	Spray drift	0.052	1.464

** This scenario is not defined for spring. As surrogate spring oil seed rape was used.

Table 8.9-14: FOCUS Steps 1, 2 and 3 PEC_{sw} and PEC_{sed} for metrafenone following multiple application of 100 g a.s./ha to <u>spring cereals</u>

Scenario FOCUS	Waterbody / Season	Max. PEC_{sw} [µg/L]	Dominant entry route	21 d – $PEC_{sw,twa}$ [µg/L]	Max. PEC_{sed} [µg/kg]
Step 1					
-	-	15.876	-	7.324	394.722
Step 2					
Northern Europe	March-May	2.486	-	1.456	66.420
Southern Europe	March-May	4.665	-	2.782	127.694
Step 3					
D3	Ditch	0.553	Spray drift	0.059	0.466
D4	Pond	0.062	Drainage	0.048	0.351
	Stream	0.461	Spray drift	0.023	0.251
D5	Pond	0.028	Spray drift	0.022	0.151
	Stream	0.476	Spray drift	0.002	0.033
R1**	Pond	0.093	Runoff	0.080	0.861
	Stream	0.500	Runoff	0.041	1.493
R4	Stream	0.663	Runoff	0.077	1.660

** This scenario is not defined for spring cereals. As surrogate spring oil seed rape was used.

Table 8.9-15: FOCUS Steps 1, 2 and 3 PEC_{sw} and PEC_{sed} for metrafenone following single application of 100 g a.s./ha to winter cereals

Scenario FOCUS	Waterbody / Season	Max. PEC_{sw} [µg/L]	Dominant entry route	21 d – $PEC_{sw,twa}$ [µg/L]	Max. PEC_{sed} [µg/kg]
Step 1					
-	-	7.938	-	3.662	197.361
Step 2					
Northern Europe	March-May	1.346	-	0.775	35.158
Southern Europe	March-May	2.457	-	1.451	66.389
Step 3					
D3	Ditch	0.631	Spray drift	0.030	0.399
D4	Pond	0.030	Drainage	0.023	0.170
	Stream	0.466	Spray drift	0.011	0.124
D5	Pond	0.022	Spray drift	0.017	0.118
	Stream	0.504	Spray drift	0.001	0.015
R1	Pond	0.034	Runoff	0.026	0.195
	Stream	0.416	Spray drift	0.016	0.557
R3	Stream	0.584	Spray drift	0.016	0.815
R4	Stream	0.417	Spray drift	0.024	0.635

Table 8.9-16: FOCUS Steps 1, 2 and 3 PEC_{sw} and PEC_{sed} for metrafenone following multiple application of 100 g a.s./ha to winter cereals

Scenario FOCUS	Waterbody / Season	Max. PEC_{sw} [µg/L]	Dominant entry route	21 d – $PEC_{sw,twa}$ [µg/L]	Max. PEC_{sed} [µg/kg]
Step 1					
-	-	15.876	-	7.324	394.722
Step 2					
Northern Europe	March-May	2.486	-	1.456	66.420
Southern Europe	March-May	4.665	-	2.782	127.694
Step 3					
D3	Ditch	0.552	Spray drift	0.055	0.463
D4	Pond	0.068	Drainage	0.053	0.376
	Stream	0.417	Spray drift	0.025	0.274
D5	Pond	0.031	Spray drift	0.025	0.176
	Stream	0.481	Spray drift	0.003	0.040
R1	Pond	0.082	Runoff	0.063	0.448
	Stream	0.515	Runoff	0.042	1.526
R3	Stream	0.508	Spray drift	0.035	1.758
R4	Stream	0.732	Runoff	0.050	1.421

Table 8.9-17: FOCUS Steps 1, 2 and 3 PEC_{sw} and PEC_{sed} for metrafenone following single application of 150 g a.s./ha to spring cereals

Scenario FOCUS	Waterbody / Season	Max. PEC_{sw} [µg/L]	Dominant entry route	21 d – $PEC_{sw,twa}$ [µg/L]	Max. PEC_{sed} [µg/kg]
Step 1					
-	-	11.907	-	5.493	296.042
Step 2					
Northern Europe	March-May	2.020	-	1.163	52.738

Scenario FOCUS	Waterbody / Season	Max. PEC_{sw} [µg/L]	Dominant entry route	21 d – $PEC_{sw,twa}$ [µg/L]	Max. PEC_{sed} [µg/kg]
Southern Europe	March-May	3.686	-	2.177	99.583
Step 3					
D3	Ditch	0.948	Spray drift	0.051	0.634
D4	Pond	0.048	Drainage	0.038	0.275
	Stream	0.775	Spray drift	0.018	0.195
D5	Pond	0.034	Spray drift	0.026	0.168
	Stream	0.796	Spray drift	0.002	0.034
R1**	Pond	0.073	Runoff	0.063	0.685
	Stream	0.622	Spray drift	0.039	1.394
R4	Stream	0.626	Spray drift	0.080	2.153

** This scenario is not defined for spring cereals. As surrogate spring oil seed rape was used.

Table 8.9-18: FOCUS Steps 1, 2 and 3 PEC_{sw} and PEC_{sed} for metrafenone following multiple application of 150 g a.s./ha to spring cereals

Scenario FOCUS	Waterbody / Season	Max. PEC_{sw} [µg/L]	Dominant entry route	21 d – $PEC_{sw,twa}$ [µg/L]	Max. PEC_{sed} [µg/kg]
Step 1					
-	-	23.815	-	10.986	592.083
Step 2					
Northern Europe	March-May	3.729	-	2.184	99.630
Southern Europe	March-May	6.998	-	4.173	191.542
Step 3					
D3	Ditch	0.829	Spray drift	0.089	0.694
D4	Pond	0.100	Drainage	0.078	0.559
	Stream	0.691	Spray drift	0.038	0.400
D5	Pond	0.043	Spray drift	0.033	0.225
	Stream	0.715	Spray drift	0.003	0.050
R1**	Pond	0.140	Runoff	0.121	1.283
	Stream	0.768	Runoff	0.062	2.187
R4	Stream	1.020	Runoff	0.117	2.457

** This scenario is not defined for spring cereals. As surrogate spring oil seed rape was used.

Table 8.9-19: FOCUS Steps 1, 2 and 3 PEC_{sw} and PEC_{sed} for metrafenone following single application of 150 g a.s./ha to winter cereals

Scenario FOCUS	Waterbody / Season	Max. PEC_{sw} [µg/L]	Dominant entry route	21 d – $PEC_{sw,twa}$ [µg/L]	Max. PEC_{sed} [µg/kg]
Step 1					
-	-	11.907	-	5.493	296.042
Step 2					
Northern Europe	March-May	2.020	-	1.163	52.738
Southern Europe	March-May	3.686	-	2.177	99.583
Step 3					
D3	Ditch	0.947	Spray drift	0.046	0.597
D4	Pond	0.049	Drainage	0.038	0.272
	Stream	0.700	Spray drift	0.018	0.198
D5	Pond	0.034	Spray drift	0.026	0.176
	Stream	0.756	Spray drift	0.002	0.022
R1	Pond	0.052	Runoff	0.040	0.293
	Stream	0.624	Spray drift	0.025	0.816
R3	Stream	0.876	Spray drift	0.025	1.203
R4	Stream	0.626	Spray drift	0.037	0.923

Table 8.9-20: FOCUS Steps 1, 2 and 3 PEC_{sw} and PEC_{sed} for metrafenone following multiple application of 150 g a.s./ha to winter cereals

Scenario FOCUS	Waterbody / Season	Max. PEC_{sw} [µg/L]	Dominant entry route	21 d – $PEC_{sw,twa}$ [µg/L]	Max. PEC_{sed} [µg/kg]
Step 1					
-	-	23.815	-	10.986	592.083
Step 2					
Northern Europe	March-May	3.729	-	2.184	99.630
Southern Europe	March-May	6.998	-	4.173	191.542
Step 3					
D3	Ditch	0.829	Spray drift	0.083	0.690
D4	Pond	0.109	Drainage	0.085	0.599
	Stream	0.625	Spray drift	0.041	0.438
D5	Pond	0.047	Spray drift	0.038	0.263
	Stream	0.722	Spray drift	0.004	0.060
R1	Pond	0.126	Runoff	0.097	0.674
	Stream	0.792	Runoff	0.064	2.240
R3	Stream	0.762	Spray drift	0.053	2.606
R4	Stream	1.127	Runoff	0.075	2.072

8.9.2.3 Pyraclostrobin and its metabolites

Reference:	CP 9.2.5/3
Report	Predicted environmental concentrations of BAS 500 F - pyraclostrobin and its metabolites in surface water and sediment following application to spring and winter cereals in Europe, Liebisch O., 2021 CALC-2586 DocID 2021/2040770 Authority registration No
Guideline(s):	FOCUS Surface Water (2001) SANCO/4802/2001-rev.2 final (May 2003) FOCUS (2015) Generic guidance for FOCUS surface water scenarios, v1.4 FOCUS Landscape and Mitigation Measures 1 (2007a) SANCO/10422/2005 v2.0 FOCUS Landscape and Mitigation Measures 2 (2007b) SANCO/10422/2005 v2.0 BAES (2020): National exposure assessment for the authorization of plant protection products (PPP) in Austria, v4
Deviations:	No
GLP:	No, not compulsory to PEC reports
Acceptability:	Yes

Table 8.9-21: Input parameters for pyraclostrobin and its metabolites for $PEC_{sw/sed}$ calculations at Steps 1–4

Compound	Pyraclostrobin	BF 500-11	BF 500-13	BF 500-14	BF 500-3	BF 500-6	BF 500-7	Value in Accordance to EU endpoint, Reference
Molar Mass (g/mol)	387.8	277.3	247.3	387.8	357.8	305.8 [d)]	297.8 [d)]	Yes Monograph 12945/ ECCO/BBA/01
Molar mass correction factor (-)	-	0.7156	0.6377	1	0.9226	0.7886	0.7679	Yes Monograph 12945/ ECCO/BBA/01
Vapour Pressure (Pa) for models	2.6×10^{-8} (20 °C)	-	-	-	-	1.0×10^{-10}	-	Yes Monograph 12945/ ECCO/BBA/01
Solubility in Water (mg/L)	1.9 (20 °C)	1000 (default)	1000 (default)	1000 (default)	0.03 (20 °C)	0.003 (20 °C)	0.005 (20 °C)	Yes Monograph 12945/ ECCO/BBA/01

Compound	**Pyraclostrobin**	**BF 500-11**	**BF 500-13**	**BF 500-14**	**BF 500-3**	**BF 500-6**	**BF 500-7**	**Value in Accordance to EU endpoint, Reference**
$DT_{50, soil}$ (d)	18 (geometric mean fied studies, normalized, n=4)	1 (default)	1 (default)	1 (default)	1 (default)	1000 (default)	1000 (default)	Yes Monograph 12945/ ECCO/BBA/01
$DT_{50, water}$ (d)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	Yes Monograph 12945/ ECCO/BBA/01
$DT_{50,sed}$ (d)	29 (worst-case, whole system, n = 2)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	Yes Monograph 12945/ ECCO/BBA/01
$DT_{50, whole\ system}$ (d)	29 (worst-case, n = 2)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	1000 (default)	Yes Monograph 12945/ ECCO/BBA/01
Max. occurrence in soil (%)	-	0 [a)]	0 [a)]	0 [a)]	0 [a)]	30.9	12.5	Yes Monograph 12945/ ECCO/BBA/01
Max. occurrence in whole system (%)	-	12	17.8	12.1	67.7	6.5	6.3	Yes Monograph 12945/ ECCO/BBA/01
Max. occurrence in water (%)	-	11.4	15.7	11.4	-	-	-	Yes Monograph 12945/ ECCO/BBA/01
Max. occurrence in sediment (%)	62	0.6	0.7	0.7	-	-	-	Yes Monograph 12945/ ECCO/BBA/01
K_{fom}	5137	0	0	0	5080	15614	19592	Calculated (K_{foc} / 1.724)
K_{foc} (ml/g)	8856 (geometric mean, n=6)	0 (conser-vative assumption)	0 (conser-vative assumption)	0 (conser-vative assumption)	8758 (geometric mean, n=6)	26919 (geometric mean; n = 6)	33776 (geometric mean; n = 6)	Yes Monograph 12945/ ECCO/BBA/01
1/n	0.95 (arithmetic mean, n=6)	1 (default)	1 (default)	1 (default)	0.83 (arithmetic mean, n=6)	1 (default)	1 (default)	Yes Monograph 12945/ ECCO/BBA/01

Compound	**Pyraclostrobin**	**BF 500-11**	**BF 500-13**	**BF 500-14**	**BF 500-3**	**BF 500-6**	**BF 500-7**	**Value in Accordance to EU endpoint, Reference**
Crop Uptake Factor	0	0	0	0	0	0	0	Default

a) Not found in soil.
b) Study BASF DocID 2012/1021122: Kinetic evaluation of BAS 500 F in water/sediment systems under aerobic conditions (see Appendix 2).
c) From aqueous photolysis study. Multiplied by factor of two to represent degradation during 24 h day with 12 hour radiation and 12 h without radiation.
d) Considering a factor of 0.5, molecular weights of metabolites BF 500-6 and BF 500-7 used are 305.8 g/mol and 297.8 g/mol, respectively, since both metabolites are dimers (2 parent molecules required to form BF 500-6 and BF 500-7)

$PEC_{sw/sed}$ for pyraclostrobin FOCUS STEPs 1-3

For actual and time-weighted average values of the PEC_{sw} for pyraclostrobin please refer to the study report [BASF DocID 2021/2040770].

STEP 1-2: Risk envelope approach – 2x150 g a.s./ha

Table 8.9-22: FOCUS Steps 1-2 PEC_{sw} and PEC_{sed} for pyraclostrobin following a single/twofold* application of 150 g a.s. /ha to spring and winter cereals

Scenario FOCUS	Waterbody / Season	Max. PEC_{sw} [µg/L]	Dominant entry route	21 d – $PEC_{sw,twa}$ [µg/L]	Max. PEC_{sed} [µg/kg]
Step 1					
-	-	10.567 multiple	-	6.369 multiple	693.739 multiple
Step 2					
Northern Europe	March-May	1.380 single	-	0.806 multiple	88.061 multiple
Southern Europe	March-May	1.934 multiple	-	1.513 multiple	163.138 multiple

* The maximum value from either the single or multiple application is reported in the table.

STEP 3:

Table 8.9-23: FOCUS Step 3 PEC_{sw} and PEC_{sed} for pyraclostrobin following a single/twofold* application of 80 g a.s. /ha to spring and winter cereals

Scenario FOCUS	Waterbody	Max. PEC_{sw} [µg/L]	Dominant entry route	21 d – $PEC_{sw,twa}$ [µg/L]	Max. PEC_{sed} [µg/kg]
Spring cereals					
D3	Ditch	0.502 single	Spray drift	0.048 multiple	0.507 multiple
D4	Pond	0.023 multiple	Spray drift	0.018 multiple	0.208 multiple
D4	Stream	0.434 single	Spray drift	0.006 single	0.094 single
D5	Pond	0.021 multiple	Spray drift	0.017 multiple	0.203 multiple
D5	Stream	0.464 single	Spray drift	0.006 single	0.100 single
R1[a)]	Pond	0.030 multiple	Spray drift	0.023 multiple	0.394 multiple
R1[a)]	Stream	0.330 single	Spray drift	0.009 single/multiple	2.709 multiple
R4	Stream	0.332 single	Spray drift	0.036 multiple	3.346 multiple
Winter cereals					
D3	Ditch	0.502 single	Spray drift	0.044 multiple	0.487 multiple
D4	Pond	0.021 multiple	Spray drift	0.016 multiple	0.228 multiple
D4	Stream	0.371 single	Spray drift	0.001 single/multiple	0.016 multiple
D5	Pond	0.024 multiple	Spray drift	0.019 multiple	0.228 multiple
D5	Stream	0.401 single	Spray drift	0.002 multiple	0.034 multiple
R1	Pond	0.032 multiple	Spray drift	0.026 multiple	0.472 multiple
R1	Stream	0.331 single	Spray drift	0.015 multiple	3.010 multiple
R3	Stream	0.464 single	Spray drift	0.015 multiple	2.525 multiple
R4	Stream	0.332 single	Spray drift	0.018 multiple	4.006 multiple

a) The R1 scenario is not defined for spring cereals. As surrogate crop for this scenario, spring oilseed rape was used.
* The maximum value from either the single or multiple application is reported in the table.

Table 8.9-24: FOCUS Step 3 PEC_{sw} and PEC_{sed} for pyraclostrobin following a single application of 120 g a.s. /ha to spring and winter cereals

Scenario FOCUS	Waterbody	Max. PEC_{sw} [µg/L]	Dominant entry route	21 d – $PEC_{sw,twa}$ [µg/L]	Max. PEC_{sed} [µg/kg]
Spring cereals					
D3	Ditch	0.754	Spray drift	0.041	0.570
D4	Pond	0.026	Spray drift	0.020	0.199
D4	Stream	0.616	Spray drift	0.003	0.043
D5	Pond	0.026	Spray drift	0.020	0.209
D5	Stream	0.633	Spray drift	0.002	0.027
R1[a)]	Pond	0.027	Runoff	0.023	0.385
R1[a)]	Stream	0.495	Spray drift	0.013	2.296
R4	Stream	0.498	Spray drift	0.041	4.501
Winter cereals					
D3	Ditch	0.753	Spray drift	0.036	0.521
D4	Pond	0.026	Spray drift	0.019	0.222
D4	Stream	0.556	Spray drift	0.001	0.016
D5	Pond	0.026	Spray drift	0.020	0.212
D5	Stream	0.601	Spray drift	0.001	0.017
R1	Pond	0.026	Spray drift	0.020	0.352
R1	Stream	0.496	Spray drift	0.009	1.794
R3	Stream	0.697	Spray drift	0.009	1.841
R4	Stream	0.498	Spray drift	0.012	2.649

a) The R1 scenario is not defined for spring cereals. As surrogate crop for this scenario, spring oilseed rape was used.

Table 8.9-25: FOCUS Step 3 PEC_{sw} and PEC_{sed} for pyraclostrobin following single/twofold* application of 120 g a.s. /ha to spring and winter cereals

Scenario FOCUS	Waterbody	Max PEC_{SW} (µg/L)	Dominant entry route	21 d- $PEC_{SW,twa}$ (µg/L)	Max PEC_{SED} (µg/kg)
Spring cereals					
D3	Ditch	0.754 single	Spray drift	0.071 multiple	0.758 multiple
D4	Pond	0.035 multiple	Spray drift	0.028 multiple	0.311 multiple
D4	Stream	0.616 single	Spray drift	0.006 multiple	0.081 multiple
D5	Pond	0.032 multiple	Spray drift	0.024 multiple	0.293 multiple
D5	Stream	0.633 single	Spray drift	0.011 multiple	0.173 multiple
R1[a)]	Pond	0.047 multiple	Spray drift	0.038 multiple	0.624 multiple
R1[a)]	Stream	0.495 single	Spray drift	0.014 multiple	4.213 multiple
R4	Stream	0.498 single	Spray drift	0.056 multiple	4.928 single
Winter cereals					
D3	Ditch	0.753 single	Spray drift	0.066 multiple	0.728 multiple
D4	Pond	0.031 multiple	Spray drift	0.025 multiple	0.340 multiple
D4	Stream	0.556 single	Spray drift	0.001 single/multiple	0.023 multiple
D5	Pond	0.036 multiple	Spray drift	0.028 multiple	0.340 multiple
D5	Stream	0.601 single	Spray drift	0.004 multiple	0.051 multiple
R1	Pond	0.048 multiple	Runoff	0.040 multiple	0.710 multiple
R1	Stream	0.496 single	Spray drift	0.023 multiple	4.473 multiple
R3	Stream	0.697 single	Spray drift	0.023 multiple	3.777 multiple
R4	Stream	0.498 single	Spray drift	0.028 multiple	5.934 multiple
R4	Stream	0.498 single	Spray drift	0.028 multiple	5.934 multiple

a) The R1 scenario is not defined for spring cereals. As surrogate crop for this scenario, spring oilseed rape was used.
* The maximum value from either the single or multiple application is reported in the table.

STEP 4:

Table 8.9-26: FOCUS Step 4 PEC_{sw} for pyraclostrobin following a single/twofold* application of 80 g a.s. /ha to spring cereals

Single and twofold application Spring cereals			**PEC_{sw} [µg/L]**						
		No spray buffer (m)	**Edge-of-field**	**5**	**10**	**15**	**20**	**10**	**15**
Scenario	**Nozzle reduction**	**Vegetative strip (m)**	**None**	**None**	**None**	**None**	**None**	**10**	**10**
D3	None	Ditch	-	0.136 a)	0.072	0.049 a)	0.037	0.072 a)	0.049 a)
	50 %		0.251 a)	0.068 a)	0.036 a)	-	-	0.036 a)	-
	75 %		0.126 a)	0.034 a)	-	-	-	-	-
	90 %		0.050 a)	-	-	-	-	-	-
D4	None	Pond	-	0.020 a)	0.014 a)	0.011 a)	0.009 a)	0.014 a)	0.011 a)
	50 %		0.012 a)	0.010 a)	0.007 a)	-	-	0.007 a)	-
	75 %		0.006 a)	0.005 a)	-	-	-	-	-
	90 %		0.002 a)	-	-	-	-	-	-
	None	Stream	-	0.159 a)	0.084 a)	0.057 a)	0.044 a)	0.084 a)	0.057 a)
	50 %		0.217 a)	0.079 a)	0.042 a)	-	-	0.042 a)	-
	75 %		0.109 a)	0.040 a)	-	-	-	-	-
	90 %		0.043 a)	-	-	-	-	-	-
D5	None	Pond	-	0.019 a)	0.013 a)	0.011 a)	0.009 a)	0.013 a)	0.011 a)
	50 %		0.011 a)	0.009 a)	0.007 a)	-	-	0.007 a)	-
	75 %		0.005 a)	0.005 a)	-	-	-	-	-
	90 %		0.002 a)	-	-	-	-	-	-
	None	Stream	-	0.169 a)	0.090 a)	0.061 a)	0.047	0.090 a)	0.061
	50 %		0.232 a)	0.085 a)	0.045 a)	-	-	0.045 a)	-
	75 %		0.116 a)	0.042 a)	-	-	-	-	-
	90 %		0.046 a)	-	-	-	-	-	-
R1 b)	None	Pond	-	0.097 a)	0.097 a)	0.097 a)	0.097 a)	0.041 a)	0.040 a)
	50 %		0.097 a)	0.097 a)	0.097 a)	-	-	0.040 a)	-
	75 %		0.097 a)	0.097 a)	-	-	-	-	-
	90 %		0.096 a)	-	-	-	-	-	-
	None	Stream	-	0.213 a)	0.213 a)	0.213 a)	0.213 a)	0.097 a)	0.097 a)
	50 %		0.213 a)	0.213 a)	0.213 a)	-	-	0.097 a)	-
	75 %		0.213 a)	0.213 a)	-	-	-	-	-
	90 %		0.213 a)	-	-	-	-	-	-
R4	None	Stream	-	0.295 a)	0.295 a)	0.295 a)	0.295 a)	0.132 a)	0.132 a)
	50 %		0.295 a)	0.295 a)	0.295 a)	-	-	0.132 a)	-
	75 %		0.295 a)	0.295 a)	-	-	-	-	-
	90 %		0.295 a)	-	-	-	-	-	-

a) Twofold application
b) Spring oilseed rape was used as surrogate crop
* The maximum value from either the single or multiple application is reported in the table.

Table 8.9-27: FOCUS Step 4 PEC_{sw} for pyraclostrobin following single/twofold* application of 80 g a.s. /ha to <u>winter cereals</u>

Single and twofold application Winter cereals			**PEC_{sw} [µg/L]**						
		No spray buffer (m)	**Edge-of-field**	**5**	**10**	**15**	**20**	**10**	**15**
Scenario	**Nozzle reduction**	**Vegetative strip (m)**	**None**	**None**	**None**	**None**	**None**	**10**	**10**
D3	None	Ditch	-	0.136	0.072	0.049	0.038	0.072	0.049
	50 %		0.252	0.068	0.036	-	-	0.036	-
	75 %		0.126	0.034	-	-	-	-	-
	90 %		0.050	-	-	-	-	-	-
D4	None	Pond	-	0.018 [a)]	0.013 [a)]	0.010 [a)]	0.008 [a)]	0.013 [a)]	0.010 [a)]
	50 %		0.010 [a)]	0.009 [a)]	0.006 [a)]	-	-	0.006 [a)]	-
	75 %		0.005 [a)]	0.004	-	-	-	-	-
	90 %		0.002	-	-	-	-	-	-
	None	Stream	-	0.135	0.072	0.049	0.037	0.072	0.049 [a]
	50 %		0.185	0.068	0.036	-	-	0.036	-
	75 %		0.093	0.034	-	-	-	-	-
	90 %		0.037	-	-	-	-	-	-
D5	None	Pond	-	0.020 [a)]	0.014 [a)]	0.011 [a)]	0.010 [a)]	0.014 [a)]	0.011 [a)]
	50 %		0.012 [a)]	0.010 [a)]	0.007 [a)]	-	-	0.007 [a)]	-
	75 %		0.006 [a)]	0.005 [a)]	-	-	-	-	-
	90 %		0.002	-	-	-	-	-	
	None	Stream	-	0.146	0.078	0.053	0.040	0.078	0.053
	50 %		0.200	0.073	0.039	-	-	0.039	-
	75 %		0.100	0.037	-	-	-	-	-
	90 %		0.040	-	-	-	-	-	-
R1	None	Pond	-	0.030 [a)]	0.027 [a)]	0.026 [a)]	0.025 [a)]	0.016 [a)]	0.014 [a)]
	50 %		0.026 [a)]	0.025 [a)]	0.024 [a)]	-	-	0.012 [a)]	-
	75 %		0.024 [a)]	0.023 [a)]	-	-	-	-	-
	90 %		0.022 [a)]	-	-	-	-	-	-
	None	Stream	-	0.171 [a)]	0.171 [a)]	0.171 [a)]	0.171 [a)]	0.077 [a)]	0.077 [a)]
	50 %		0.171 [a)]	0.171 [a)]	0.171 [a)]	-	-	0.077 [a)]	-
	75 %		0.171 [a)]	0.171 [a)]	-	-	-	-	-
	90 %		0.171 [a)]	-	-	-	-	-	-
R3	None	Stream	-	0.187 [a)]	0.187 [a)]	0.187 [a)]	0.187 [a)]	0.090	0.086 [a)]
	50 %		0.232	0.187 [a)]	0.187 [a)]	-	-	0.086 [a)]	-
	75 %		0.187 [a)]	0.187 [a)]	-	-	-	-	-
	90 %		0.187 [a)]	-	-	-	-	-	-
R4	None	Stream	-	0.299 [a)]	0.299 [a)]	0.299 [a)]	0.299 [a)]	0.136 [a)]	0.136 [a)]
	50 %		0.299 [a)]	0.299 [a)]	0.299 [a)]	-	-	0.136 [a)]	-
	75 %		0.299 [a)]	0.299 [a)]	-	-	-	-	-
	90 %		0.299 [a)]	-	-	-	-	-	-

[a)] Twofold application

* The maximum value from either the single or multiple application is reported in the table.

Table 8.9-28: FOCUS Step 4 PEC_{sw} for pyraclostrobin following single application of 120 g a.s. /ha to spring cereals

Single application on spring cereals			**PEC_{SW} [µg/L]**						
		No spray buffer (m)	**Edge-of-field**	**5**	**10**	**15**	**20**	**10**	**15**
Scenario	**Nozzle reduction**	**Vegetative strip (m)**	**None**	**None**	**None**	**None**	**None**	**10**	**10**
D3	None	Ditch	-	0.204	0.108	0.074	0.056	0.108	0.074
	50 %		0.377	0.102	0.054	-		0.054	-
	75 %		0.188	0.051	-	-	-	-	-
	90 %		0.075	-	-	-	-	-	-
D4	None	Pond	-	0.022	0.016	0.013	0.011	0.016	0.013
	50 %		0.013	0.011	0.008	-		0.008	-
	75 %		0.006	0.006	-	-	-	-	-
	90 %		0.003	-	-	-	-	-	-
	None	Stream	-	0.225	0.119	0.081	0.062	0.119	0.081
	50 %		0.308	0.112	0.060	-		0.060	-
	75 %		0.154	0.056	-	-	-	-	-
	90 %		0.062	-	-	-	-	-	-
D5	None	Pond	-	0.022	0.016	0.013	0.011	0.016	0.013
	50 %		0.013	0.011	0.008	-		0.008	-
	75 %		0.006	0.006	-	-	-	-	-
	90 %		0.003	-	-	-	-	-	-
	None	Stream	-	0.231	0.123	0.084	0.064	0.123	0.084
	50 %		0.316	0.116	0.061	-		0.061	-
	75 %		0.158	0.058	-	-	-	-	-
	90 %		0.063	-	-	-	-		
R1 [a)]	None	Pond	-	0.079	0.079	0.079	0.079	0.033	0.033
	50 %		0.079	0.079	0.079	-	-	0.033	-
	75 %		0.079	0.079	-	-	-	-	-
	90 %		0.078	-	-	-	-	-	-
	None	Stream	-	0.181	0.174	0.174	0.174	0.096	0.079
	50 %		0.248	0.174	0.174	-	-	0.079	-
	75 %		0.174	0.174	-	-	-	-	-
	90 %		0.174	-	-	-	-	-	-
R4	None	Stream	-	0.250	0.250	0.250	0.250	0.114	0.114
	50 %		0.250	0.250	-	-	-	0.114	-
	75 %		0.250	0.250	-	-	-	-	-
	90 %		0.250	-	-	-	-	-	-

a) Spring oil seed rape was used as surrogate crop

Table 8.9-29: FOCUS Step 4 PEC_{sw} for pyraclostrobin following single/twofold* application of 120 g a.s. /ha to spring cereals

Single and twofold application on spring cereals			Pyraclostrobin – 1x120 and 2x120 g a.s./ha PEC_{SW} [µg/L]						
		No spray buffer (m)	Edge-of-field	5	10	15	20	10	15
Scenario	Nozzle reduction	Vegetative strip (m)	None	None	None	None	None	10	10
D3	None	Ditch	-	0.204	0.108	0.074	0.056	0.108	0.074
	50 %		0.377	0.102	0.054	-	-	0.054	-
	75 %		0.188	0.051	-	-	-	-	-
	90 %		0.075	-	-	-	-	-	-
D4	None	Pond	-	0.030 [a)]	0.021 [a)]	0.017 [a)]	0.014 [a)]	0.021 [a)]	0.017 [a)]
	50 %		0.017 [a)]	0.015 [a)]	0.011 [a)]	-	-	0.011 [a)]	-
	75 %		0.009 [a)]	0.007 [a)]	-	-	-	-	-
	90 %		0.003	-	-	-	-	-	-
	None	Stream	-	0.225	0.119	0.081	0.062	0.119	0.081
	50 %		0.308	0.112	0.060	-	-	0.060	-
	75 %		0.154	0.056	-	-	-	-	-
	90 %		0.062	-	-	-	-	-	-
D5	None	Pond	-	0.028 [a)]	0.020 [a)]	0.016 [a)]	0.013 [a)]	0.020 [a)]	0.016 [a)]
	50 %		0.016 [a)]	0.014 [a)]	0.010 [a)]	-	-	0.010 [a)]	-
	75 %		0.008 [a)]	0.007 [a)]	-	-	-	-	-
	90 %		0.003	-	-	-	-	-	-
	None	Stream	-	0.231	0.123	0.084	0.064	0.123	0.084
	50 %		0.316	0.116	0.061	-	-	0.061	-
	75 %		0.158	0.058	-	-	-	-	-
	90 %		0.063	-	-	-	-	-	-
R1 [b)]	None	Pond	-	0.161 [a)]	0.160 [a)]	0.160 [a)]	0.160 [a)]	0.067 [a)]	0.067 [a)]
	50 %		0.160 [a)]	0.160 [a)]	0.159 [a)]	-	-	0.066 [a)]	-
	75 %		0.159 [a)]	0.159 [a)]	-	-	-	-	-
	90 %		0.159 [a)]	-	-	-	-	-	-
	None	Stream	-	0.352 [a)]	0.352 [a)]	0.352 [a)]	0.352 [a)]	0.161 [a)]	0.161 [a)]
	50 %		0.352 [a)]	0.352 [a)]	0.352 [a)]	-	-	0.161 [a)]	-
	75 %		0.352 [a)]	0.352 [a)]	-	-	-	-	-
	90 %		0.352 [a)]	-	-	-	-	-	-
R4	None	Stream	-	0.450 [a)]	0.450 [a)]	0.450 [a)]	0.450 [a)]	0.202 [a)]	0.202 [a)]
	50 %		0.450 [a)]	0.450 [a)]	0.450 [a)]	-	-	0.202 [a)]	-
	75 %		0.450 [a)]	0.450 [a)]	-	-	-	-	-
	90 %		0.450 [a)]	-	-	-	-	-	-

[a)] Twofold application
[b)] Spring oilseed rape was used as surrogate crop
* The maximum value from either the single or multiple application is reported in the table.

Table 8.9-30: FOCUS Step 4 PEC_{sw} for pyraclostrobin following single application of 120 g a.s. /ha to winter cereals

Single application Winter cereals			PECSW [µg/L]						
		No spray buffer (m)	Edge-of-field	5	10	15	20	10	15
Scenario	Nozzle reduction	Vegetative strip (m)	None	None	None	None	None	10	10
D3	None	Ditch	-	0.204	0.108	0.074	0.056	0.108	0.074
	50 %		0.376	0.102	0.054	-	-	0.054	-
	75 %		0.188	0.051	-	-	-	-	-
	90 %		0.075	-	-	-	-	-	-
D4	None	Pond	-	0.022	0.016	0.013	0.011	0.016	0.013
	50 %		0.013	0.011	0.008	-	-	0.008	-
	75 %		0.006	0.006	-	-	-	-	-
	90 %		0.003	-	-	-	-	-	-
	None	Stream	-	0.203	0.108	0.074	0.056	0.108	0.074
	50 %		0.278	0.102	0.054	-	-	0.054	-
	75 %		0.139	0.051	-	-	-	-	-
	90 %		0.056	-	-	-	-	-	-
D5	None	Pond	-	0.022	0.016	0.013	0.011	0.016	0.013
	50 %		0.013	0.011	0.008	-	-	0.008	-
	75 %		0.006	0.006	-	-	-	-	-
	90 %		0.003	-	-	-	-	-	-
	None	Stream	-	0.219	0.116	0.079	0.060	0.116	0.079
	50 %		0.301	0.110	0.058	-	-	0.058	-
	75 %		0.150	0.055	-	-	-	-	-
	90 %		0.060	-	-	-	-	-	-
R1	None	Pond	-	0.023	0.019	0.018	0.018	0.016	0.013
	50 %		0.018	0.018	0.017	-	-	0.008	-
	75 %		0.016	0.016	-	-	-	-	-
	90 %		0.015	-	-	-	-	-	-
	None	Stream	-	0.181	0.115	0.115	0.115	0.096	0.066
	50 %		0.248	0.115	0.115	-	-	0.052	-
	75 %		0.124	0.115	-	-	-	-	-
	90 %		0.115	-	-	-	-	-	-
R3	None	Stream	-	0.254	0.135	0.133	0.133	0.135	0.092
	50 %		0.348	0.133	0.133	-	-	0.067	-
	75 %		0.174	0.133	-	-	-	-	-
	90 %		0.133	-	-	-	-	-	-
R4	None	Stream	-	0.203	0.203	0.203	0.203	0.096	0.092
	50 %		0.249	0.203	0.203	-	-	0.092	-
	75 %		0.203	0.203	-	-	-	-	-
	90 %		0.203	-	-	-	-	-	-

Table 8.9-31: FOCUS Step 4 PEC_{SW} for pyraclostrobin following single/twofold* application of 120 g a.s. /ha to winter cereals

Single application Winter cereals			**PEC_{SW} [µg/L]**						
		No spray buffer (m)	**Edge-of-field**	**5**	**10**	**15**	**20**	**10**	**15**
Scenario	**Nozzle reduction**	**Vegetative strip (m)**	**None**	**None**	**None**	**None**	**None**	**10**	**10**
D3	None	Ditch	-	0.204	0.108	0.074	0.056	0.108	0.074
	50 %		0.376	0.102	0.054	-	-	0.054	-
	75 %		0.188	0.051	-	-	-	-	-
	90 %		0.075	-	-	-	-	-	-
D4	None	Pond	-	0.027 [a)]	0.019 [a)]	0.015 [a)]	0.013 [a)]	0.019 [a)]	0.015 [a)]
	50 %		0.016 [a)]	0.013 [a)]	0.010 [a)]	-	-	0.010 [a)]	-
	75 %		0.008 [a)]	0.007 [a)]	-	-	-	-	-
	90 %		0.003	-	-	-	-	-	-
	None	Stream	-	0.203	0.108	0.074	0.056	0.108	0.074
	50 %		0.278	0.102	0.054	-	-	0.054	-
	75 %		0.139	0.051	-	-	-	-	-
	90 %		0.056	-	-	-	-	-	-
D5	None	Pond	-	0.031 [a)]	0.022 [a)]	0.017 [a)]	0.014 [a)]	0.022 [a)]	0.017 [a)]
	50 %		0.018 [a)]	0.015 [a)]	0.011 [a)]	-	-	0.011 [a)]	-
	75 %		0.009 [a)]	0.008 [a)]	-	-	-	-	-
	90 %		0.004 [a)]	-	-	-	-	-	-
	None	Stream	-	0.219	0.116	0.079	0.060	0.116	0.079
	50 %		0.301	0.110	0.058	-	-	0.058	-
	75 %		0.150	0.055	-	-	-	-	-
	90 %		0.060	-	-	-	-	-	-
R1	None	Pond	-	0.045 [a)]	0.042 [a)]	0.040 [a)]	0.038 [a)]	0.024 [a)]	0.021 [a)]
	50 %		0.040 [a)]	0.039 [a)]	0.037 [a)]	-	-	0.018 [a)]	-
	75 %		0.036 [a)]	0.036 [a)]	-	-	-	-	-
	90 %		0.034 [a)]	-	-	-	-	-	-
	None	Stream	-	0.261 [a)]	0.261 [a)]	0.261 [a)]	0.261 [a)]	0.119 [a)]	0.119 [a)]
	50 %		0.261 [a)]	0.261 [a)]	0.261 [a)]	-	-	0.119 [a)]	-
	75 %		0.261 [a)]	0.261 [a)]	-	-	-	-	-
	90 %		0.261 [a)]	-	-	-	-	-	-
R3	None	Stream	-	0.287 [a)]	0.287 [a)]	0.287 [a)]	0.287 [a)]	0.135	0.131 [a)]
	50 %		0.348	0.287 [a)]	0.287 [a)]	-	-	0.131 [a)]	-
	75 %		0.287 [a)]	0.287 [a)]	-	-	-	-	-
	90 %		0.287 [a)]	-	-	-	-	-	-
R4	None	Stream	-	0.458 [a)]	0.458 [a)]	0.458 [a)]	0.458 [a)]	0.208 [a)]	0.208 [a)]
	50 %		0.458 [a)]	0.458 [a)]	0.458 [a)]	-	-	0.208 [a)]	-
	75 %		0.458 [a)]	0.458 [a)]	-	-	-	-	-
	90 %		0.458 [a)]	-	-	-	-	-	-

[a)] Twofold application
* The maximum value from either the single or multiple application is reported in the table.

Metabolites of pyraclostrobin

Only maximum values are reported, which can also be considered as worst-case estimates of short-term and long-term exposure.

Table 8.9-32: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for the metabolites of pyraclostrobin following single/multiple application of 150 g a.s. /ha to winter cereals [a)]

Scenario FOCUS	Season	Max PEC_{sw} [µg/L]	Max PEC_{sed} [µg/kg]
BF 500-11			
Step 1	-	8.818 multiple	not reported
Step 2			
Northern Europe	Mar-May	1.139 multiple	not reported
Southern Europe	Mar-May	2.071 multiple	not reported
BF 500-13			
Step 1	-	11.664 multiple	not reported
Step 2			
Northern Europe	Mar-May	1.507 multiple	not reported
Southern Europe	Mar-May	2.740 multiple	not reported
BF 500-14			
Step 1	-	12.434 multiple	not reported
Step 2			
Northern Europe	Mar-May	1.607 multiple	not reported
Southern Europe	Mar-May	2.920 multiple	not reported
BF 500-3			
Step 1	-	not reported	443.116 multiple
Step 2			
Northern Europe	Mar-May	not reported	57.259 multiple
Southern Europe	Mar-May	not reported	104.080 multiple
BF 500-6			

Scenario FOCUS	Season	Max PEC_{sw} [µg/L]	Max PEC_{sed} [µg/kg]
Step 1 [a)]			
-	-	not reported	216.075 multiple
Northern Europe	Mar-May	not reported	33.180 multiple
Southern Europe	Mar-May	not reported	65.472 multiple
BF 500-7			
Step 1	-	not reported	106.830 multiple
Step 2			
Northern Europe	Mar-May	not reported	15.885 multiple
Southern Europe	Mar-May	not reported	30.919 multiple

Note: metabolites are only reported for the relevant compartment
a) At Steps 1 and 2 only the crop winter cereals was considered, representing the worst-case in the context of a risk envelope approach

8.9.2.4 $PEC_{SW/SED}$ of the formulated product BAS 758 00 F

The maximum concentration in surface water for the formulation BAS 758 00 F from entry through spray drift following single application is provided for the application of 1.5 L product/ha. For the assessment, the FOCUS drift calculator which is implemented in FOCUS SWASH 5.3 was used and a static water body of 30 cm depth was assumed (i.e. FOCUS ditch).

Table 8.9-33: Initial PEC_{sw} for BAS 758 00 F following single application to cereals

Buffer distance [m]	Application rate of formulation [L/ha]	Formulation density [g/cm³]	Application rate of formulation [g/ha]	Drift rate [%]	Formulation $PEC_{SW,max}$ [µg/L]
1	1.5	1092	1638	1.93	10.524
3	1.5	1092	1638	0.82	4.455

8.10 Fate and behaviour in air (KCP 9.3, KCP 9.3.1)

8.10.1 Mefentrifluconazole

All information provided in this chapter was previously evaluated in the frame of the EU review of mefentrifluconazole and were summarized from the DAR [*European Commission / RMS UK, Co-RMS AT and FR (2018): Draft Assessment Report prepared according to the Commission Regulation (EU) N° 1107/2009. BAS 750F (Mefentrifluconazole)*].

Table 8.10-1: Summary of atmospheric degradation and behaviour of Mefentrifluconazole

Compound	Mefentrifluconazole
Direct photolysis in air	Not studied
Quantum yield of direct phototransformation	No data available
Photochemical oxidative degradation in air	DT_{50} : 19.995 hours (1.97 days) derived by the Atkinson model OH (12h) concentration assumed = 1.5 x10^6 mol cm^{-3}
Volatilisation	No data generated Vapour pressure [Pa]: 3.2 x 10^{-6} at 20°C Henry's Law Constant [Pa m^3 mol^{-1}]: 1.6 × 10^{-3}
Metabolites	Not required / Not relevant

The vapour pressure at 20 °C of the active substance mefentrifluconazole is < 10^{-5} Pa. Therefore, mefentrifluconazole is regarded as non-volatile. Therefore, exposure of adjacent surface waters and terrestrial ecosystems by the active substance mefentrifluconazole due to volatilization with subsequent deposition does not have to be considered.

According to the EFSA Conclusion on mefentrifluconazole, route of exposure via air is not relevant for mefentrifluconazole [*EFSA (European Food Safety Authority), 2018. Conclusion on the peer review of the pesticide risk assessment of the active substance BAS 750 F (Mefentrifluconazole). EFSA Journal 2018;16(7):5379, 32 pp. doi:10.2903/j.efsa.2018.5379*].

8.10.2 Metrafenone

Table 8.10-2: Summary of atmospheric degradation and behaviour of metrafenone

Compound	Metrafenone
Direct photolysis in air	Not studied
Quantum yield of direct phototransformation	No data available
Photochemical oxidative degradation in air	DT_{50} : 0.63 hour derived by the Atkinson model OH (12h) concentration assumed = 1.5 x10^6 mol cm^{-3}
Volatilisation	No data generated Vapour pressure [Pa]: 1.53 x 10^{-4} at 20°C Henry's Law Constant [Pa m^3 mol^{-1}]: 1.32 × 10^{-1}
Metabolites	Not required / Not relevant

The vapour pressure at 20 °C of the active substance metrafenone is > 10^{-4} Pa. Hence the active substance metrafenone may be regarded as volatile (volatilisation from soil and plant surfaces). Therefore, exposure of adjacent surface waters and terrestrial ecosystems by the active substance metrafenone due to volatilization with subsequent deposition should be considered. However, it was noted in radiolabelled soil and water studies that significant radioactivity as organic volatiles was not found in volatile traps, which may be the result of the relatively strong adsorption of the active substance. FOCUS SW modelling does not proceed beyond Step 3 and therefore volatilisation and deposition is not required to be considered further.

Based on the reported vapor pressure and Henry’s Law constant, metrafenone may be prone to some volatilization from soil or water surfaces. However, it was noted in radiolabelled soil and water studies that significant radioactivity as organic volatiles was not found in volatile traps, which may be the result of the relatively strong adsorption of the active substance; therefore, it is unlikely that significant amounts of metrafenone will be volatilized in the field. The very short Atkinson half-life indicates that any residues entering air are likely to be rapidly degraded and concentrations of metrafenone in air are expected to be negligible.

8.10.3 Pyraclostrobin

Table 8.10-3: Summary of atmospheric degradation and behaviour of pyraclostrobin

Compound	Pyraclostrobin
Direct photolysis in air	< 2 h
Quantum yield of direct phototransformation	2.17 × 10^{-1}
Photochemical oxidative degradation in air	DT_{50} (h): < 2 h, derived by the Atkinson model (24 h day, AOP)
Volatilisation	Vapor pressure (Pa) (20ºC): 2.6 × 10^{-8} Henry's Law Constant (Pa m^3/mol): 5.3 × 10^{-6}
Metabolites	n.a.

The vapour pressure at 20°C of the active substance pyraclostrobin is < 10^{-5} Pa. Hence pyraclostrobin is regarded as non-volatile. Therefore, exposure of adjacent surface waters and terrestrial ecosystems by the active substance pyraclostrobin due to volatilization with subsequent deposition does not have to be considered.

Appendix 1 Lists of data considered in support of the evaluation

List of data submitted by the applicant and relied on

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP 9.1.1/1	Hilton, M., Callow, B.	2014	Determination of rates of decline for Metrafenone and its metabolite CL377160 in soil aerobic, anaerobic and photolysis degradation studies according to the FOCUS Kinetics Guidance Document 2014/1083467 Exponent International Ltd., Harrogate North Yorkshire HG2 8RE, United Kingdom no Unpublished	No	BASF
KCP 9.1.1.2.1/1	Hilton, M., Callow, B.	2014	Determination of rates of decline for Metrafenone in field dissipation studies according to the FOCUS Kinetics Guidance Document 2014/1083469 Exponent International Ltd., Harrogate North Yorkshire HG2 8RE, United Kingdom no Unpublished	No	BASF
KCP 9.1.1.2.1/2	Horn, A.	2006	Normalisation of the degradation rate constant of BAS 500 F - Pyraclostrobin in the field to a reference temperature of 20°C and a reference soil moisture at pF2 2006/1007384 BASF AG, Limburgerhof, Germany Fed.Rep. no Unpublished	No	BASF
KCP 9.1.1.2.2/1	Johnston, R.	2006	BAS 560 F (AC 375839) 500 g ai/L SC (SF 09955): Accumulation of BAS 560 F residues in soil (Italy, 1999-2005) 2006/7011060 BASF Corp., Research Triangle Park NC, United States of America yes Unpublished	No	BASF
KCP 9.1.1.2.2/2	Johnston, R.	2006	BAS 560 F (AC 375839) 500 g ai/L SC (SF 10358): Accumulation of BAS 560 F residues in soil (Germany, 1999 - 2005) 2006/7011058 BASF Corp., Research Triangle Park NC, United States of America yes Unpublished	No	BASF

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP 9.1.1.2.2/3	Johnston, R.	2006	BAS 560 F (AC 375839) 300 g ai/L SC (SF 10358): Accumulation of BAS 560 F residues in soil (Germany, 1999-2005) 2006/7011059 BASF Corp., Research Triangle Park NC, United States of America yes Unpublished	No	BASF
KCP 9.1.1.2.2/4	Johnston, R.	2006	BAS 560 F (AC 375839) 500 g ai/L SC (SF 09955): Accumulation of BAS 560 F residues in soil (Spain, 1999-2005) 2006/7011061 BASF Corp., Research Triangle Park NC, United States of America yes Unpublished	No	BASF
KCP 9.1.3/1	Liebisch, O.	2021	Predicted environmental concentrations of BAS 750 F - mefentrifluconazole and its metabolites in soil and groundwater following application to spring and winter cereals in Europe 2021/2040773 RIFCon GmbH, Hirschberg, Germany Fed.Rep. no Unpublished	No	BASF
KCP 9.1.3/2	Liebisch, O.	2022	Predicted environmental concentrations of BAS 560 F - metrafenone and its metabolites in soil and groundwater following application to spring and winter cereals in Europe 2022/2003534 RIFCon GmbH, Hirschberg, Germany Fed.Rep. no Unpublished	No	BASF
KCP 9.1.3/3	Liebisch, O.	2021	Predicted environmental concentrations of BAS 500 F - pyraclostrobin and its metabolites in soil and groundwater following application to spring and winter cereals in Europe 2021/2040765 RIFCon GmbH, Hirschberg, Germany Fed.Rep. no Unpublished	No	BASF

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
~~KCP 9.2/1~~	~~Miles, B.~~	~~2012~~	~~Kinetic evaluation of BAS 500 F in water/sediment systems under aerobic conditions~~ ~~2012/1021122~~ ~~BASF SE, Limburgerhof, Germany Fed.Rep.~~ ~~no~~ ~~Unpublished~~	~~No~~	~~BASF~~
KCP 9.2.4.1/1	Liebisch, O.	2021	Predicted environmental concentrations of BAS 750 F - mefentrifluconazole and its metabolites in soil and groundwater following application to spring and winter cereals in Europe 2021/2040773 RIFCon GmbH, Hirschberg, Germany Fed.Rep. no Unpublished	No	BASF
KCP 9.2.4.1/2	Liebisch, O.	2022	Predicted environmental concentrations of BAS 560 F - metrafenone and its metabolites in soil and groundwater following application to spring and winter cereals in Europe 2022/2003534 RIFCon GmbH, Hirschberg, Germany Fed.Rep. no Unpublished	No	BASF
KCP 9.2.4.1/3	Liebisch, O.	2021	Predicted environmental concentrations of BAS 500 F - pyraclostrobin and its metabolites in soil and groundwater following application to spring and winter cereals in Europe 2021/2040765 RIFCon GmbH, Hirschberg, Germany Fed.Rep. no Unpublished	No	BASF
KCP 9.2.5/1	Liebisch, O.	2021	Predicted environmental concentrations of BAS 750 F - mefentrifluconazole and its metabolites in surface water and sediment following application to spring and winter cereals in Europe 2021/2040776 RIFCon GmbH, Hirschberg, Germany Fed.Rep. no Unpublished	No	BASF

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP 9.2.5/2	Liebisch, O.	2022	PEC of BAS 560 F and its metabolites in surface water and sediment to spring and winter cereals in Europe 2021/2041362 RIFCon GmbH, Hirschberg, Germany Fed.Rep. no Unpublished	No	BASF
KCP 9.2.5/3	Liebisch, O.	2021	Predicted environmental concentrations of BAS 500 F - pyraclostrobin and its metabolites in surface water and sediment following application to spring and winter cereals in Europe 2021/2040770 RIFCon GmbH, Hirschberg, Germany Fed.Rep. no Unpublished	No	BASF

List of data submitted or referred to by the applicant and relied on, but already evaluated at EU peer review

There are no already evaluated data/studies submitted in this Section

List of data submitted or referred to by the applicant and relied on, but already evaluated

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP 9.1.1/1	Hilton, M., Callow, B.	2014	Determination of rates of decline for Metrafenone and its metabolite CL377160 in soil aerobic, anaerobic and photolysis degradation studies according to the FOCUS Kinetics Guidance Document 2014/1083467 Exponent International Ltd., Harrogate North Yorkshire HG2 8RE, United Kingdom no Unpublished	No	BASF

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP 9.1.1.2.1/1	Hilton, M., Callow, B.	2014	Determination of rates of decline for Metrafenone in field dissipation studies according to the FOCUS Kinetics Guidance Document 2014/1083469 Exponent International Ltd., Harrogate North Yorkshire HG2 8RE, United Kingdom no Unpublished	No	BASF
KCP 9.1.1.2.1/2	Horn, A.	2006	Normalisation of the degradation rate constant of BAS 500 F - Pyraclostrobin in the field to a reference temperature of 20°C and a reference soil moisture at pF2 2006/1007384 BASF AG, Limburgerhof, Germany Fed.Rep. no Unpublished	No	BASF
KCP 9.1.1.2.2/1	Johnston, R.	2006	BAS 560 F (AC 375839) 500 g ai/L SC (SF 09955): Accumulation of BAS 560 F residues in soil (Italy, 1999-2005) 2006/7011060 BASF Corp., Research Triangle Park NC, United States of America yes Unpublished	No	BASF
KCP 9.1.1.2.2/2	Johnston, R.	2006	BAS 560 F (AC 375839) 500 g ai/L SC (SF 10358): Accumulation of BAS 560 F residues in soil (Germany, 1999 - 2005) 2006/7011058 BASF Corp., Research Triangle Park NC, United States of America yes Unpublished	No	BASF
KCP 9.1.1.2.2/3	Johnston, R.	2006	BAS 560 F (AC 375839) 300 g ai/L SC (SF 10358): Accumulation of BAS 560 F residues in soil (Germany, 1999-2005) 2006/7011059 BASF Corp., Research Triangle Park NC, United States of America yes Unpublished	No	BASF

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP 9.1.1.2.2/4	Johnston, R.	2006	BAS 560 F (AC 375839) 500 g ai/L SC (SF 09955): Accumulation of BAS 560 F residues in soil (Spain, 1999-2005) 2006/7011061 BASF Corp., Research Triangle Park NC, United States of America yes Unpublished	No	BASF
KCP 9.2/1	Miles, B.	2012	Kinetic evaluation of BAS 500 F in water/sediment systems under aerobic conditions 2012/1021122 BASF SE, Limburgerhof, Germany Fed.Rep. no Unpublished	No	BASF

Appendix 2 Detailed evaluation of the new Annex II studies

A 2.1 CP 9.1.1/1: 2014/1083467

Comments of zRMS:	The submitted study was not used in exposure assessment. In PECs assessment the agreed endpoint of 7d was used (EFSA, 2006).

Reference:	CP 9.1.1/1
Report	Determination of rates of decline for Metrafenone and its metabolite CL377160 in soil aerobic, anaerobic and photolysis degradation studies according to the FOCUS Kinetics Guidance Document, Hilton M.,Callow B., 2014a report No EU-1400778.UK4-4100 2014/1083467 Authority registration No
Guideline(s):	FOCUS (2006) Degradation Kinetics Sanco/10058/2005 version 2.0
Deviations:	No
GLP:	No (not applicable)
Acceptability:	Yes

EXECUTIVE SUMMARY

The degradation of metrafenone in four laboratory aerobic soils and two laboratory anaerobic soils was kinetically evaluated according to the recommendations of the FOCUS Kinetics Guidance document. In addition the degradation of metrafenone and its soil photolytic metabolite CL 377160 was kinetically evaluated for the single soil studied in the soil photolysis study of Ta (2001).

The SFO model provided a very good description of the degradation of metrafenone in both aerobic and anaerobic soils, and for the photolytic degradation of metrafenone in soil. In all cases the chi^2 % error was significantly < 15%, and visual fits and plots of the residuals confirmed the very good fits. P values for the SFO rate constant were < 0.05 in all cases. SFO non-normalized laboratory soil aerobic DT_{50} values at 20 ºC were in the range 154.7 – 275.3 days; corresponding DT_{50} values normalized to standard moisture (pF2) and temperature (20 ºC) conditions were in the range 154.7 – 252.1 days, with a calculated geometric mean of 200.9 days. SFO laboratory anaerobic DT_{50} values at 20 ºC were 7.3 – 15.6 days. The photolytic soil DT_{50} for metrafenone under the continuous irradiation conditions of the test was 12.6 days, which when corrected for aerobic degradation in the dark control of the same study was 13.7 days.

The SFO model provided an acceptable description of the decline of the soil photolysis metabolite CL 377160. The calculated DT_{50} under the conditions of the test was 5.5 days with a formation fraction of 0.52. The metabolite was not observed at concentrations which allowed a kinetic evaluation in the dark control, and therefore no correction for aerobic degradation in the dark control was performed.

MATERIAL AND METHODS

A. MATERIALS

The degradation of metrafenone in four laboratory aerobic soils from the studies of Steinfuehrer (2000a&b) and Steinfuehrer and Weis (2000), and two laboratory anaerobic soils from the studies of van Dijk and Kunz (2001) and Huang (2002) was kinetically evaluated according to the recommendations of the FOCUS Kinetics Guidance document. In addition, the degradation of metrafenone and its soil photolytic metabolite CL 377160 was kinetically evaluated for the single soil studied in the soil photolysis study of Ta (2001). Therefore, for this test alone parent metrafenone was assumed to degrade directly to CL 377160, as well as to a sink compartment. CL 377160 was also assumed to degrade to a sink compartment.

B. STUDY DESIGN

Data from the experimental studies were treated in accordance with the recommendations of FOCUS Kinetics Guidance. Therefore, radioactivity extracted but remaining unidentified and unextracted soil radioactivity were added to extracted radioactivity identified as metrafenone at t=0. In addition, where the same soils were treated with different radio-labelled forms of metrafenone in the same study, measured concentrations of metrafenone in % AR were treated as replicates.

The kinetic modelling was performed using KINGUII vers. 2. The approach used followed that given in Chapters 7 & 8 of the FOCUS Kinetics Guidance Document for the determination of both persistence and modelling endpoints. The suitability of the fit of the models was evaluated both visually, based on a graphical plot of the degradation and in a plot of the residuals, and statistically by calculating the minimum % error required to pass the χ^2 test at a probability of 0.05. For SFO kinetics a t-test was also performed to evaluate whether the determined parameters were significantly different to 0. T-test statistics are not appropriate to describe the FOMC fitting parameters alpha and beta, and therefore confidence intervals were reported. Statistical parameters were compared to the acceptability criteria as indicated in FOCUS Kinetics guidance. However, it is also stated within that guidance that acceptability criteria should not be considered as absolute cut-off criteria.

For the determination of the persistence end-point FOCUS Kinetics guidance recommends that both SFO and FOMC models are initially applied to the data. However, in this case for the aerobic soils visual and statistical parameters for SFO fits indicated an excellent fit, which it was considered could not be improved upon using biphasic kinetics. Therefore, only SFO kinetics were applied to aerobic soils data.

Only the SFO model was applied to the metabolite observed in the soil photolysis study. The kinetics for the metabolism scheme were determined in a sequential manner. Initially those for metrafenone were fitted. These were then fixed, and those for the metabolite CL 377160 were then determined using the data from all time-points. The initial values were first set to those obtained and then the parameters for all the substances were fitted to the data.

DT_{50} values were normalized to standard temperature and moisture conditions of 20 ºC and field capacity (pF2) for use in FOCUS modelling. Temperature correction was performed using the Arrhenius equation, with an activation energy of 65.4 $kj.mol^{-1}$, which corresponds to a Q10 of 2.58. Correction to standard soil moisture was performed with the Walker equation using a Walker exponent of 0.7 and the default values presented in FOCUS groundwater guidance (FOCUS 2012).

RESULTS AND DISCUSSION

The results of the determinations were evaluated using visual and statistical methods. Summaries of the results and kinetic fitting parameters are summarized in Table A 1 for aerobic incubations, Table A 2 for anaerobic incubations, and Table A 3 for the photolytic study incubations.

For all aerobic soil incubations, optimization using SFO kinetics provided an excellent statistical and visual fit to the data. For the two anaerobic soils kinetic fitting with both SFO and FOMC kinetics was performed. The fits using SFO kinetics were concluded to be better based upon the chi-squared values, and because FOMC alpha and beta parameters appeared more uncertain than the rate constant from the SFO kinetic fit.

For the kinetic fitting of the irradiated test in the soil photolysis study of Ta 2001, fits with SFO and FOMC kinetics were performed. SFO kinetics were concluded to provide the better fit by virtue of the chi-squared statistics, the visual fits, and the level of uncertainty as indicated by the t-test results for SFO fits and the confidence intervals for both alpha and beta parameters in FOMC fits. The chi-squared statistic for the photolytic degradation of CL 377160 was high. However, examination of visual fits demonstrated that this is likely to be due to the large scatter of the data, which demonstrate a random scatter of data points rather than any systematic deviation. The t-test statistic was also < 0.1 and is therefore acceptable according to FOCUS Kinetics guidance (FOCUS 2006). Overall, the metabolite fit was considered acceptable.

It should be noted that for the aerobic soils all DT_{50} and DT_{90} values, and for the photolytic degradation the DT_{90} values, were extrapolated beyond the study durations and therefore exact values should be treated with a degree of caution. Temperature and moisture normalized DT_{50} values for the calculation of modelling endpoints are summarized in Table A 4 for the aerobic soils.

Table A 1: Summary of the results of the kinetic determinations for metrafenone in the aerobicsoils incubated in Steinfuehrer 2000a, Steinfuehrer 2000b, and Steinfuehrer and Weis 2000

Model	Parameter	Engelstadt/ Benz silty loam 20°C & 50% MWHC	Sporkenheim loamy sand 20°C & 50% MWHC	Binger Pfad sandy loam 20°C & 50% MWHC	Gensingen clay loam 20°C & 50% MWHC	Sporkenheim loamy sand 10°C & 40 - 50% MWHC
SFO	χ^2 error (%)	2.9	5.9	5.1	5.0	2.7
	P	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	k	0.00294	0.00448	0.00252	0.00285	0.00130
	DT_{50}	236.0	154.7	275.3	243.1	532.1
	DT_{90}	784.0	513.9	914.4	807.4	1767.5

Table A 2: Summary of the results of the kinetic determinations for metrafenone in the anaerobic soils incubated in van Dijk & Kunz, 2001 (with amendments in Martin, 2002a) and Huang 2002

Model	Parameter	Engelstadt/ Benz silty loam 20°C	Stetten silty clay loam 20 ºC
SFO	χ^2 error (%)	11.2	8.0
	P	< 0.05	< 0.05
	k	0.0950	0.0445
	DT_{50}	7.3	15.6
	DT_{90}	24.2	51.8
FOMC	χ^2 error (%)	11.4	8.2
	α	469.2 ± 2980	317.8 ± 3219
	β	4934 ± 31374	7139 ± 72424
	DT_{50}	7.3	15.6
	DT_{90}	24.3	51.9

Table A 3: Summary of the results of the kinetic determinations for metrafenone and CL 377160 in the soil photolysis study of Ta 2001

Model	Parameter	Engelstadt/ Benz silty loam 20°C		
		Irradiated		Dark
		Metrafenone	CL 377160	Metrafenone
SFO	χ^2 error (%)	9.3	40.0	2.3
	P	< 0.05	< 0.05	< 0.05
	k	0.0551	0.1259	0.00441
	DT_{50}	12.6	5.5	157.3
	DT_{90}	41.8	18.3	522.6
	FF	-	0.52	-
FOMC	χ^2 error (%)	9.3	-	-
	α	782.8 ± NA	-	-
	β	14288 ± NA	-	-
	DT_{50}	12.7	-	-
	DT_{90}	42.1	-	-

NA = values not available – too high to be calculated.

Table A 4: Summary of the calculated modelling DT_{50} values from the kinetic determinations normalized to 20 ºC and field capacity (pF2)

Soil	Incubation Temperature (ºC)	Incubation soil moisture (%)	Soil Field Capacity (%)	Study DT_{50} (d)	Normalized DT_{50} (20 ºC/ pF2)
Engelstadt/ Benz silty loam	20 ºC	50 % MWHC = 23.7	27	236.0	215.4
Sporkenheim loamy sand	20 ºC	50 % MWHC = 16.4	14	154.7	154.7
Binger Pfad sandy loam	20 ºC	50 % MWHC = 16.8	19	275.3	252.1
Gensingen clay loam	20 ºC	50 % MWHC = 20.3	28	243.1	194.1
Sporkenheim loamy sand	10 ºC	40 - 50 % MWHC* = 17.1	14	532.6	206.1
Geometric mean =					200.9**

* As a worst-case assumption soil moisture content in the study was assumed as 50 % MWHC for the entire study duration.
** The moisture and temperature normalized geometric mean DT_{50} value at 20°C was calculated with the exclusion of the Sporkenheim soil test performed at 10 ºC.

CONCLUSIONS

The SFO model provided a very good description of the degradation of metrafenone in both aerobic and anaerobic soils, and for the photolytic degradation of metrafenone in soil. In all cases the chi^2 % error was significantly < 15%, and visual fits and plots of the residuals, and t-test statistics confirmed the very good fits. SFO non-normalized laboratory soil aerobic DT_{50} values at 20 °C were in the range 154.7 – 275.3 days; corresponding DT_{50} values normalized to standard moisture (pF2) and temperature (20 °C) conditions were in the range 154.7 – 252.1 days, with a calculated geometric mean of 200.9 days. SFO laboratory anaerobic DT_{50} values at 20 ˚C were 7.3 – 15.6 days. The photolytic soil DT_{50} for metrafenone under the continuous irradiation conditions of the test was 12.6 days, which when corrected for aerobic degradation in the dark control of the same study was 13.7 days.

The SFO model provided an acceptable description of the decline of the soil photolysis metabolite CL 377160. The calculated DT_{50} under the conditions of the test was 5.5 days with a formation fraction of 0.52.

A 2.2 CP 9.1.1.2.1/1: 2014/1083469

Comments of zRMS:	The submitted study was not used in exposure assessment. In exposure assessment the agreed endpoints were used (EFSA, 2006).

Reference:	CP 9.1.1.2.1/1
Report	Determination of rates of decline for Metrafenone in field dissipation studies according to the FOCUS Kinetics Guidance Document, Hilton M.,Callow B., 2014b report No EU-1400778.UK4-8755 2014/1083469 Authority registration No
Guideline(s):	FOCUS (2006) Degradation Kinetics Sanco/10058/2005 version 2.0
Deviations:	No
GLP:	No (Not applicable)
Acceptability:	Yes

EXECUTIVE SUMMARY

A kinetic evaluation was performed in accordance with FOCUS kinetics guidance for field dissipation studies conducted following applications of metrafenone at trial sites in Germany, the UK, Northern France and Denmark. Kinetic evaluations were performed solely for the purpose of deriving persistence endpoints for comparison against regulatory trigger values, and therefore normalization to standard soil temperature and moisture conditions was not performed. No metabolites were observed above the LOQ in any of the field dissipation studies, and hence, kinetic fitting for metrafenone alone was performed.

The SFO kinetic model provided a good description of the degradation of metrafenone at both the German and UK field trial sites. While the chi-squared error value was higher than 15%, values were only marginally improved when using FOMC kinetics. Visual fits and plots of the residuals did not display any systematic deviation, instead indicating that the chi-squared values were related to the large random scatter of measured concentrations. P values for the SFO rate constant were < 0.05 in both cases.

For the trials conducted in Northern France and Denmark biphasic FOMC kinetics displayed better statistical and visual fits than SFO kinetics. Consequently, DFOP kinetics were also evaluated, and based upon statistical data and visual fits, displayed the best fit for the trial conducted in Denmark. However, FOMC kinetics provided the best fit for the trial conducted in Northern France.

Reported DT_{50} values for metrafenone were in the range 22.2 - 145 days (n=4). Reported DT_{90} values were in the range 473 – 1221 days (n=3). KINGUII could not calculate the DT_{90} value for metrafenone associated with the Denmark trial site. The value of 1221 days from the Northern France site is extrapolated beyond the study duration and therefore should be treated with a degree of caution.

MATERIAL AND METHODS

A. MATERIALS

The degradation of metrafenone in four field dissipation studies conducted at sites in Germany, the UK, Northern France and Denmark and reported in the studies of Jones (2002a), Smalley (2002j) and Bamber (2002a&b) was kinetically evaluated according to the recommendations of the FOCUS Kinetics Guidance document. No residues of the metabolite CL 377160 above the LOQ (0.02 mg/kg) were observed in any soil specimen from any trial. As a result, kinetic evaluation was only possible for parent metrafenone. No residues of metrafenone above the LOQ (0.02 mg/kg) were observed below the 0-10 cm horizon in any soil specimen from any trial. The rate of degradation of metrafenone was therefore determined based upon concentrations in the 0-10 cm soil layer alone.

B. STUDY DESIGN

Treatment of raw data from the field dissipation studies in accordance with FOCUS Kinetics guidance was not required for the trials conducted in Germany, the UK and Denmark. For the trial conducted in Northern France two samples were reported as < LOQ, and therefore, in accordance with FOCUS Kinetics guidance, values were set to ½ x LOQ for the purposes of kinetic evaluation.

The kinetic modelling was performed solely for the determination of persistence endpoints for comparison against regulatory trigger values, using KINGUII vers 2. The approach used followed that given in Chapters 7 & 9 of the FOCUS Kinetics Guidance Document. The suitability of the fit of the models was evaluated both visually, based on a graphical plot of the degradation and in a plot of the residuals, and statistically by calculating the minimum % error required to pass the χ^2 test at a probability of 0.05. For SFO and DFOP kinetics a t-test was also performed to evaluate whether the determined parameters were significantly different to 0. T-test statistics are not appropriate to describe the FOMC fitting parameters alpha and beta, and therefore confidence intervals were reported. Statistical parameters were compared to the acceptability criteria as reported in FOCUS Kinetics guidance; however, it is also stated within that guidance that acceptability criteria should not be considered as absolute cut-off criteria.

For the determination of the persistence end-point FOCUS Kinetics guidance recommends that both SFO and FOMC models are initially applied to the data. If the SFO model gave an acceptable visual and statistical fit then this was accepted. If the FOMC model gave a more appropriate fit DFOP kinetics were also applied to the data. The results of the FOMC and DFOP models were then compared to determine which gave the best fit. The model which was considered to best represent the data was then selected.

RESULTS AND DISCUSSION

The results of the determinations were evaluated using visual and statistical methods. Summaries of the results and kinetic fitting parameters are summarized in Table A 5.

For the trials conducted in Germany and the UK, SFO chi-squared % error values were only marginally higher than those from the respective FOMC fits. While the chi-squared error value for both the SFO and FOMC fits for the UK trial are high, examination of the visual fits and plots of residuals for the SFO kinetics demonstrated no systematic deviation for either the UK or German trials. The high chi-squared error values for the UK trial are therefore considered to demonstrate the large random scatter of the measured concentrations. In addition, comparison of t-test statistics for SFO fits and error values for alpha and beta parameters in FOMC demonstrated that SFO fits were more certain. Overall, it was concluded that SFO kinetics provided the best fits for both the German and UK trials.

For the trials conducted in Northern France and Denmark comparison of chi-squared error values, visual fits and residual plots, for the SFO and FOMC fits indicated that FOMC kinetics provided the better fits. Therefore, additional kinetic fits were performed for both trials with biphasic DFOP kinetics.

For the trial conducted in Northern France, DFOP kinetics did not improve upon the FOMC kinetic fit. FOMC kinetics were therefore concluded to provide the best fit at the Northern France trial. For the Danish trial, DFOP kinetics provided a better fit to the data based on comparison of both the chi-squared error values and the visual fits. Consequently, for the Danish trial DFOP kinetics were concluded to provide the best fit.

It should be noted that for the Northern France site FOMC kinetic fit the DT_{90} value of 1221 days is extrapolated significantly beyond the study termination. Hence, the reported DT_{90} value for the Northern France site should be treated with caution. The DT_{90} value for the DFOP fit for the Denmark site could not be calculated by KINGUII, indicating a large degree of uncertainty. This uncertainty is reflected in the error value associated with t-test statistic for k_{slow} for the DFOP fit, which is 0.457. In reality, it is likely that the DT_{90} value is significantly shorter than indicated by the k_{slow} value of the Danish DFOP fit, since the g statistic of 0.597 means that effectively the slow phase is only represented by the latter data points which display a large variation when compared to the slow decline calculated.

Table A 5: Summary of the results of the kinetic determinations for metrafenone in the field dissipation studies conducted in Germany, the UK, Northern France and Denmark

Model	Parameter	Germany	UK	Northern France	Denmark
SFO	χ^2 error (%)	**12.6**	**31.5**	28.2	21.6
	P	**<0.05**	**<0.05**	<0.05	<0.05
	k	**0.00486 ± 0.00175**	**0.00477 ± 0.00505**	0.01001 ± 0.00783	0.00317 ± 0.00273
	DT_{50}	**143**	**145**	69.2	219
	DT_{90}	**473**	**483**	230	727*
FOMC	χ^2 error (%)	11.4	30.9	**22.6**	11.0
	α	0.91219 ± 1.37132	0.69157 ± 1.74679	**0.42419 ± 0.31989**	0.23845 ± 0.11791
	β	95.997 ± 242.69	69.211 ± 301.12	**5.38648 ± 12.5453**	3.58358 ± 6.86267
	DT_{50}	109	119	**22.2**	62.0
	DT_{90}	1102*	1863*	**1221***	55986*
DFOP	χ^2 error (%)	-	-	23.2	**9.6**
	k_{fast}	-	-	0.18333 ± 0.25740	**0.03486 ± 0.02227**
	k_{slow}	-	-	0.0047637 ± 0.00545	**0.00007 ± 0.00118**
	g	-	-	0.478	**0.597**
	P-k_{fast}	-	-	0.100	**<0.05**
	P-k_{slow}	-	-	0.063	**0.457**
	DT_{50}	-	-	17.4	**51.7**
	DT_{90}	-	-	347	**NC**

Fits presented in bold are those considered to be the best fits.
NC = not calculated by KINGUII
* = value extrapolated beyond study duration

CONCLUSIONS

A kinetic evaluation was performed in accordance with FOCUS kinetics guidance for four field dissipation studies conducted with metrafenone. Values were derived for persistence endpoints of metrafenone for comparison against regulatory trigger values.

Based upon fitting statistics and visual fits the SFO kinetic model provided the best description of the degradation of metrafenone at two field trial sites. For the trial conducted in Northern France biphasic FOMC kinetics displayed the best fit, while DFOP kinetics displayed the best fit for the trial conducted in Denmark.

Reported DT_{50} values for metrafenone were in the range 22.2 - 145 days (n=4). Reported DT_{90} values were in the range 473 – 1221 days (n=3). KINGUII could not calculate the DT_{90} value associated with the Denmark trial site. The DT_{90} value of 1221 days is extrapolated beyond the study duration and therefore this value should be treated with a degree of caution.

A 2.3 CP 9.1.1.2.1/2: 2006/1007384

Comments of zRMS:	The submitted study was evaluated in 2019. The normalization was performed in accordance with FOCUC kinetics guidance to reference temperature of 20 deg C and soil moisture at pF2. **DT_{50} (20°C, pF2) = 18 d** This endpoint was used in exposure assessment.

Reference:	CP 9.1.1.2.1/2
Report	Normalisation of the degradation rate constant of BAS 500 F - Pyraclostrobin in the field to a reference temperature of 20°C and a reference soil moisture at pF2, Horn A., 2006 report No EU-CALC-645 BASF DocID 2006/1007384 Authority registration No
Guideline(s):	FOCUS Kinetics (2005)
Deviations:	No
GLP:	No, not necessary with this type of study.
Acceptability:	Yes

EXECUTIVE SUMMARY

Following the recommendations of FOCUS work group on degradation kinetics [*FOCUS (2005) "Guidance Document on Estimating Persistence and Degradation Kinetics from Environmental Fate Studies on Pesticides in EU Registration" Report of the FOCUS Work Group on Degradation Kinetics, EC Document Reference Sanco/10058/2005 version 1.0*], degradation rate constants of BAS 500 F determined in the field dissipation studies were normalized to a reference temperature of 20°C and a reference soil moisture at pF2. The half-lives were calculated on the basis of the normalized degradation rate constants.

MATERIAL AND METHODS

Input data for the modeling study

Data from the field dissipation studies with BAS 500 F given in g/ha were used as input for the kinetic modeling approach. The modeled residue data represent a sum of the residue in the total horizon sampled. Regarding t = 0 the data from the soil-filled Petri dishes used in the application rate verification experiments were considered. For t > 0 the raw data were modified considering the generic guidance of FOCUS regarding values below the limit of detection (LOD) and the limit of quantification (LOQ). The resulting modified time series of concentrations used in the kinetic modeling approach are shown in Table A 6.

Table A 6: Concentration of BAS 500 F in soil of the field trials after modification of LOQ data for kinetic modeling following FOCUS

D05/02/97							
DAT	0	14	26	53	96	173	350
Residue [g ha^{-1}]	206	140	107	40	18	7.5	-
D08/01/97							
DAT	0	12	26	64	98	182	362
Residue [g ha^{-1}]	193	152	123	54	30	xxx	7.5
DU2/02/97							
DAT	0	12	29	57	96	174	347
Residue [g ha^{-1}]	208	92	105	59	7.5	-	-
ALO/01/98							
DAT	0	14	30	60	98	182	349
Residue [g ha^{-1}]	166	61	36	37	24	7.5	-
ALO/02/98							
DAT	0	15	30	63	99	182	356
Residue [g ha^{-1}]	194	53	60	53	48	23	7.5
HUS/02/98							
DAT	0	16	31	59	100	177	351
Residue [g ha^{-1}]	200	88	102	56	34	7.5	-

DAT = days after treatment, xxx: samples lost accidentally

Suitability of field dissipation data for kinetic modelling

Evaluation criteria have been compiled by the Dutch regulatory authority (CTB) that provide guidance on whether the results of field dissipation studies can be used to derive transformation parameters of crop protection chemicals in soil, which in turn can be used in kinetic simulations of potential groundwater contamination by crop protection chemicals leaching [*CTB (1999) CTB Guideline: Handleiding Toelating Bestrijdingsmiddelen, HTB. Annex 2: Checklist for assessing whether a field study on pesticide persistence in soil can be used to estimate transformation rates in soil.*]. The field studies for BAS 500 F were checked for compliance with the criteria.

Estimation and normalisation of the degradation rate constants

A single first-order kinetic approach was applied to the estimation and normalisation of the degradation rate constants of BAS 500 F. The principle equation for single first-order degradation is shown in Equation A 1.

Equation A 1 Principle equation of single first-order kinetics

$$C_t = C_{initial}\, e^{-k_{act}\, t} \quad \text{(a)}$$

$$k_{act} = f_{temp} * f_{moist} * k_{ref} \quad \text{(b)}$$

with	C_t	concentration at time t	[g ha^{-1}]
	$C_{initial}$	concentration at time 0	[g ha^{-1}]
	k_{act}	estimated actual degradation rate constant (at current soil temperature and moisture conditions)	[d^{-1}]
	t	time after application	[d]
	f_{temp}	temperature correction factor	[-]
	f_{moist}	moisture correction factor	[-]
	k_{ref}	estimated degradation rate constant at reference conditions (soil temperature 20°C, soil moisture at pF2)	[d^{-1}]

The parameters $C_{initial}$ (initial concentration) and k_{ref} (degradation rate constant at reference conditions, i.e., the normalized degradation rate constant) were estimated with the program ModelMaker v.3 patch 3.0.4 whereby the Marquardt optimization procedure (option least squares) was used for calculation. The degradation rate constant at reference conditions (k_{ref}) resulting from the estimation procedure was used to derive the DT_{50}-value according to Equation A 2.

Equation A 2 Calculation of DT_{50}-value according to first-order kinetics

$$DT_{50} = \frac{\ln(2)}{k_{ref}}$$

The degradation rate constants k were corrected for differences between actual daily soil moisture and a reference soil moisture at pF2 using the modified Walker equation as recommended by FOCUS [*FOCUS (2000) "FOCUS groundwater scenarios in the EU review of active substances" Report of the FOCUS Groundwater Scenarios Workgroup, EC Document Reference Sanco/321/2000 rev.2*]. The correction factor f_{moist} for soil moisture is calculated using Equation A 3.

Equation A 3 Influence of the soil moisture on the degradation behaviour

$$f_{moist} = \begin{cases} \left(\frac{\theta_{act}}{\theta_{ref}}\right)^B & \text{for } \theta_{ref} > \theta_{act} \\ 1 & \text{for } \theta_{ref} \le \theta_{act} \end{cases}$$

where	f_{moist}	moisture correction factor	[-]
	θ_{act}	actual soil moisture (volumetric water content)	[-]
	θ_{ref}	reference soil moisture at pF2	[-]
	B	exponent of the moisture response function, B = 0.7	[-]

The daily actual soil moisture used for the moisture correction of the different field trials was estimated with the software tool FOCUS-PEARL version 2.2.2 using actual soil characteristics and weather data (temperature, global radiation, precipitation). For each study site a PEARL scenario was created. A soil depth of 0.5 m and a 0.025 m discretization scheme were selected for the PEARL simulations. The lower boundary condition of the simulation profile was set to "Free Drainage".

The weather data for the scenarios were derived from stations located in the vicinity of the trial sites. The actual evaporation amounts of the different field trials were estimated within PEARL using the Makkink approach. Weather data were available for the study period. To allow a model warm-up period the data were replicated such that three years of warm-up were established.

The soils were characterized according to the soil properties given in the field study reports (see ref. II A 7.3.1/1, ref. II A 7.3.1/2). For derivation of hydraulic parameters, i.e., the van Genuchten parameters which describe the soil-water retention characteristics, soil hydraulic pedotransfer functions based on the HYPRES database [*Nemes, A.; Wösten, J.H.M.; Lilly, A. (2001) Development of soil hydraulic pedotransfer functions on a European scale: their usefulness in the assessment of soil quality. In Stott, D.E.; Mohtar, R.H., Steinhardt, G.C. (eds.) Sustaining the global farm. Selected papers from the 10th International Soil Conservation Organization Meeting, May 1999.*] were used. A bulk density of 1.5 g cm^{-3} was assumed. The results were also used for derivation of reference soil moisture at pF2 using the van Genuchten approach.

The PEARL simulations for actual soil moisture were evaluated for the 0-0.1 m soil layer, as BAS 500 F was found exclusively in this layer in the field trials. The simulated daily soil moisture data from the respective soil depths were averaged and compared to soil moisture measurements of samples from 0-0.1 m at the soil sampling dates. Regarding ALO/02/98 and HUS/02/98 the model underestimated the measured water content, which would result in a non-conservative soil moisture correction factor. Therefore, a conservative correction factor $f_{moist} = 1$ was assumed for these soils. For the other trials correction factors were derived according to Equation A 3.

The degradation rate constants k was also corrected for differences between actual daily temperatures and a reference temperature of 20°C using the Q_{10}-rule as described in the report of the FOCUS soil modeling working group [*FOCUS (1997) "Soil Persistence Models and EU Registration." - Report of the FOCUS soil group, 7617/VI/96 29.02.97*]. The Q_{10} response function was applied for temperatures above 0°C. Below 0°C it was assumed that no degradation occurs. A temperature correction factor f_{temp} was thus derived according to Equation A 4.

Equation A 4 Influence of the daily temperature on the degradation behaviour

$$f_{temp} = \begin{cases} Q_{10}^{\frac{Tact - Tref}{10}} & \text{for } T_{act} > 0°C \\ 0 & \text{for } T_{act} \leq 0°C \end{cases}$$

where	f_{temp}	temperature correction factor	[-]
	T_{act}	actual soil temperature	[°C]
	T_{ref}	reference temperature (20°C)	[°C]
	Q_{10}	factor of increase of degradation rate with an increase in temperature of 10°C (Q_{10} = 2.2, FOCUS recommendation)	[-]

Average daily soil temperatures for the 0-0.1 m soil layer were also derived from the simulation runs with the software tool FOCUS-PEARL version 2.2.2.

Optimization statistics

The optimization was evaluated based on visual assessment and statistical goodness-of-fit measures.

The basic statistical indices for model evaluation were the coefficient of determination (r^2) and the minimum error to pass the Chi^2 test as recommended by the FOCUS work group on degradation kinetics [*FOCUS (2005)*]. The minimum error was calculated according to Equation A 5.

Equation A 5 Calculation of minimum error [%] value from χ^2 test statistics

$$err = 100 \cdot \sqrt{\frac{1}{\chi^2_{tabulated}} \cdot \sum \frac{(C-O)^2}{\overline{O}^2}}$$

where	err	measurement error percentage
	C	calculated value
	O	observed value
	$\overline{O}$	mean of all observed values
	$\chi^2_{tabulated}$	tabulated Chi^2 value based on m degrees of freedom (number of measurements after averaging of replicates minus number of parameters according to FOCUS) and probability □ (5 % according to FOCUS)

The tabulated Chi^2, assuming a significance level of 5%, was obtained from Excel 2000 using the CHIINV(α,m) function.

In addition to the estimated parameters ($\hat{a}_i$) ModelMaker also provides the standard deviations (σ_i) of the estimates. These results were used to assess the confidence that can be assigned to the parameters returned from the optimization. Assuming normal distribution for the parameters, the parameter estimate and the respective standard deviation were combined to the ratio $t = \hat{a}_i/\sigma_i$, which is t-distributed. The probability (p-value) corresponding to the calculated t-value was calculated with the t-distribution function TDIST in Excel 2000. A one-sided distribution was chosen, the degrees of freedom equals the number of observations minus the total number of estimated parameters. The parameter is considered significantly different from zero if the p-value is smaller than 0.05, i.e., considering 5% significance level.

RESULTS AND DISCUSSION

Evaluation of field dissipation data for kinetic modeling according to CTB

The evaluation of the CTB criteria is summarized in Table A 7. The trials D05/02/97, D08/01/97, DU2/02/97 and HUS/02/98 match the criteria completely, allowing normalisation of the degradation rate constants. The field trials ALO/01/98 and ALO/02/98 violate the requirement for a single first-order model (criterion 3) and were therefore excluded from the calculation of normalized degradation times.

Table A 7: Evaluation of suitability of field dissipation data of pyraclostrobin for kinetic modeling

Criterion 1: *Check that only a non-significant fraction of the dose can have leached out of the soil layers that were sampled (consider the amount of rainfall and concentration measured in the deepest sampled layer).*
The residues of BAS 500 F in the lowest sampled layer are always lower or equal to the detection limit. Therefore, it can be concluded that all trials fulfill the criterion that only a non-significant fraction of the dose has leached out of the soil layers that were sampled.
Criterion 2: *Check that only a non-significant fraction of the dose disappeared via processes at the soil surface such as volatilisation or photochemical transformation (consider the period between spraying and the first significant rainfall event; check additionally that there is no initial fast decline followed by a slower decline; a recovery in the field that is much lower than the dose is also an indication of losses at the soil surface).*
Volatilization: Volatilization is not to be expected a significant loss route for BAS 500 F because of the very low the vapor pressure of 2.6 x 10^{-10} hPa at 20°C. Phototransformation: The soil photolysis study of BAS 500 F shows that the presence of light does not have a strong influence on the degradation of BAS 500 F on soil. When incubated at 40% MWC the soil photolytic half-life was 36.9 days (continuous radiation) and the half-life of the dark control samples (aerobic soil metabolism) was 31.7 days. Incubating the soil at 80% MWC decreased the half-life of BAS 500 F in the irradiated and the dark control samples (8.9 days and 10.4 days, respectively). The irradiated soil samples were subjected to 0 to 15 days of continuous illumination, which is equivalent to 30 days of 12 hr light and 12 h darkness per day. Recovery: Moderate recovery rates were observed for the initial samplings of the different field trials, but the first-order degradation kinetics are not influenced by the low initial value. Therefore, the low recoveries may be regarded as a problem of the application technique and the sampling of initial soil samples rather than an indication of significant surface losses that would influence the calculation of the half-life. Phases of degradation: The visual assessment of the fitted curve to the observed residues indicates a bi-phasic degradation behaviour for the trials ALO/01/98 and ALO/02/98. There is no clear indication that these findings can be attributed to losses at the soil surface, i.e., other causes such as changes in the environmental settings during the experiment should also be considered for the interpretation. As no clear conclusion can be drawn regarding the cause of the bi-phasic behaviour the field trials ALO/01/98 and ALO/02/98 were excluded from the calculation of degradation times. For the trials D05/02/97, D08/01/97, DU2/02/97 and HUS/02/98 it can be concluded that only a non-significant fraction of the dose disappeared via processes at the soil surface.
Criterion 3: *Check that the decrease of the total amount with time corresponds reasonably well with first-order kinetics (either via curve-fitting or via applying a simulation model); if there is much scatter in the relationship between total amount with time (probably due to an inadequate sampling strategy) the estimation of a transformation rate in soil may be not acceptable.*
The field trials ALO/01/98 and ALO/02/98 present a bi-phasic degradation behaviour and a single first-order model could not be fitted adequately to the data. The trials were therefore excluded from the calculation of degradation times. For the trials D05/02/97, D08/01/97, DU2/02/97 and HUS/02/98 a single first-order model could be fitted to the data. The coefficients of determination for the respective fits (Table A 6) give much evidence for a successful estimation according to first-order kinetics.
Criterion 4: *Check whether the soil has been characterized (organic matter, clay etc.).*
The soil characteristics are described in detail in the reports of the field dissipation study.
Criterion 5: *Check whether the location can be considered representative with respect to soil type and climate for European conditions.*
The sites of the field dissipation studies are located in Europe and have been selected to cover the range of agroclimatic conditions across Europe (Sweden (north), Germany (middle), Spain (south)) and agricultural soil (sand - clay).
Criterion 6: *Check whether meteorological data are available, and whether a correction for the difference between the actual soil temperature (mean temperature measured during the day in top soil layer) and 20°C has been made (an acceptable alternative is temperature during the day in air measured on location, or nearby whether station).*
Meteorological data are available and have been used in the standardisation procedure.
Criterion 7: *Check whether the dose is reported and whether the formulated product is relevant (no granulate or slow release).*
The dose is reported. The trials were performed using the formulated product BAS 500 01 F (EC formulation) which is a typical type of formulation for end use products of BAS 500 F. Therefore, the degradation behaviour of BAS 500 F under field conditions could satisfactorily be investigated with the formulations used and therefore is relevant.

Table A 7: Evaluation of suitability of field dissipation data of pyraclostrobin for kinetic modeling

Criterion 8: *If inverse modelling was used, check whether the model used is acceptable.*
The model used is identical to the subroutines in FOCUS-PEARL, which is a simulation model recommended by FOCUS for EU-registration (*FOCUS 2000: "FOCUS groundwater scenarios in the EU review of active substances" Report of the FOCUS Groundwater Scenarios Workgroup, EC Document Reference Sanco/321/2000 rev.2, 202 pp.*).
Criterion 9: *Check whether analytical procedure was documented well and whether recovery was acceptable.*
The analytical procedure has been documented well and the recovery was acceptable.
Criterion 10: *Check history of pesticide use on plot. In preceding years no active ingredient or structure analog should be used.*
No active ingredient and no structural analog have been used in the preceding years.
Criterion 11: *Check method of application. Pesticide should not be applied below soil surface.*
The pesticide has been applied onto the bare soil surface.
Criterion 12: *Check method of sampling. Method of sampling should be adequate.*
The method of sampling is described in detail in the reports of the field studies and is seen to be adequate.
Criterion 13*: Check influence of crop. Uptake of pesticide by crop should be negligible.*
Application was onto bare soil and crops were not present during the field studies.

Estimated parameters of BAS 500 F and calculated half-lives in soil

The estimated parameters (initial concentrations and normalized degradation rate constants) and the goodness-of-fit measures for the different field trials are presented in Table A 8.

Table A 8: **Normalized rate constants k_{ref} and half-lives of pyraclostrobin according to single first-order kinetics**

Field trial	**$C_{initial}$ [g ha^{-1}]**	**k_{ref} [d^{-1}]**	**DT_{50} (20°C, pF2) [d]**	**r^2**	**err [%]**
D05/02/97	204.9	0.0554*	12.5	0.994	5.1
D08/01/97	191.0	0.0262*	26.5	0.997	3.3
DU2/02/97	183.0	0.0452*	15.3	0.845	22.0
ALO/01/98	Bi-phasic degradation: single first-order model not applicable				
ALO/02/98	Bi-phasic degradation: single first-order model not applicable				
HUS/02/98	178.8	0.0337*	20.6	0.888	20.2
Geometric mean			**18.0**		

r^2 = coefficient of determination; err = minimum error to pass χ^2 test
* = significantly different from zero at P = 0.05

The field trials ALO/01/98 and ALO/02/98 were excluded from the calculation of degradation times as they showed a bi-phasic degradation behaviour, and a single first-order model could therefore not be fitted adequately to the data.

The high coefficients of determination and minimum error values of the other field trials give evidence of successful estimations. For D05/02/97 and D08/01/97 the goodness-of-fit indicators are close to the optimum values. For DU2/02/97 and HUS/02/98 a stronger deviation from the optimum can be observed which is mainly caused by differences to a single high residual value at the second sampling date. This finding must be attributed to the stronger natural variability of field data and is no indication for deficits in the model fits. The residual plots of the respective trials support this interpretation as no apparent systematic error can be observed.

A 2.4 CP 9.1.1.2.2/1-4: 2006/7011058-2006/7011061

Comments of zRMS:	The submitted study was not used in exposure assessment. In exposure assessment the agreed endpoints were used (EFSA, 2006).

Reference:	CP 9.1.1.2.2/1
Report	BAS 560 F (AC 375839) 500 g ai/L SC (SF 09955): Accumulation of BAS 560 F residues in soil (Italy, 1999-2005), Johnston R.L., 2006 report No US-BN-IT-99-310, SubNo-200407-14-02 2006/7011060 Authority registration No
Guideline(s):	EEC 91/414 Annex II 7, EEC 91/414 Annex III 9, EEC 95/36, SETAC Procedures for assessing the environmental fate and ecotoxicity for pesticides (March 1995)
Deviations:	No
GLP:	yes (certified by United States Environmental Protection Agency)
Acceptability:	Yes

Reference:	CP 9.1.1.2.2/2
Report	BAS 560 F (AC 375839) 500 g ai/L SC (SF 10358): Accumulation of BAS 560 F residues in soil (Germany, 1999 - 2005), Johnston R.L., 2006 report No US-BN-GE-99-302, SubNo-200407-11-02, EXT-113369 2006/7011058 Authority registration No
Guideline(s):	EEC 91/414 Annex II 7, EEC 91/414 Annex III 9, EEC 95/36, SETAC
Deviations:	No
GLP:	yes (certified by United States Environmental Protection Agency)
Acceptability:	Yes

Reference:	CP 9.1.1.2.2/3
Report	BAS 560 F (AC 375839) 300 g ai/L SC (SF 10358): Accumulation of BAS 560 F residues in soil (Germany, 1999-2005), Johnston R.L., 2006 report No US-BN-GE-99-303, SubNo-200407-12-02 2006/7011059 Authority registration No
Guideline(s):	EEC 91/414 Annex II 7, EEC 91/414 Annex III 9, EEC 95/36, BBA IV 4-1, SETAC Procedures for assessing the environmental fate and ecotoxicity for pesticides (March 1995)
Deviations:	No
GLP:	yes (certified by United States Environmental Protection Agency)
Acceptability:	Yes

Reference:	CP 9.1.1.2.2/4
Report	BAS 560 F (AC 375839) 500 g ai/L SC (SF 09955): Accumulation of BAS 560 F residues in soil (Spain, 1999-2005), Johnston R.L., 2006 report No US-BN-SP-99-309, SubNo-200407-13-02 2006/7011061 Authority registration No
Guideline(s):	EEC 91/414 Annex II 7, EEC 91/414 Annex III 9, EEC 95/36, SETAC Procedures for assessing the environmental fate and ecotoxicity for pesticides (March 1995)
Deviations:	No
GLP:	yes (certified by Department of Health of the Government of the United Kingdom, United Kingdom)
Acceptability:	Yes

EXECUTIVE SUMMARY

Four soil accumulation studies were conducted; two at a site in Schwabenheim Germany, on plots cropped with vines and cereals, and two bare soil plots in Italy and Spain. Spray applications of varying SC formulations of metrafenone were applied at all trial sites. At the first Schwabenheim trial, eight applications were made to vines every year, for 6 consecutive years (1999 – 2004 inclusive), with individual application rates of between 60 – 160 g as/ ha. For the second Schwabenheim trial two applications of 200 g as/ ha were made to a field cropped with cereals for seven years between 1999 and 2005 inclusive, with the exception of 2001, when no applications were made. For the Italian and Spanish trials eight applications of 100 g as/ ha were applied to bare soil every year for six years between 1999 and 2004 inclusive.

Where crops were present cultivation methods during the trials were according to good agricultural practice, with the exception that at harvest crops were incorporated back into the soil/ worked in. No cultivation was performed for the Italian and Spanish bare soil trials.

Samples were collected annually from both treated and untreated plots in the form of 20 x 30 cm soil cores. A final sample was collected approximately 1 year after the 1st application in the season of final application. All samples from all four trials were frozen at ≤ -18°C within 24 hours of collection prior to shipment to the analytical facility. Upon receipt at the analytical facility samples were stored frozen at ≤ -18°C until analysis.

The majority of samples were separated into 0-5 cm, 5-10 cm, 10 – 20 cm, and 20 – 30 cm soil layers. The upper two layers were analyzed for residues of metrafenone and its photolytic soil metabolite CL 377160. If positive residues at or above the limit of quantitation (LOQ) were detected in the uppermost layers, the 10 to 20 cm layer was analyzed. If there were no detectable residues above the LOQ in the 0-10 or 10-20 cm layers, the following soil layer was not analyzed. For the Schwabenheim trials soil cores collected in 1999 and 2000, for the Italian bare soil trial soil cores collected in 1999 – 2001, and for the Spanish trial soil cores collected in 1999 – 2002, were divided into 10 cm segments, such that the top layer was 0-10 cm.

Soil samples were extracted by vortexing, firstly with acetonitrile, and then with triethylamine/water/acetonitrile. After centrifugation aliquots of extracts were combined, and further centrifuged and filtered prior to analysis by LC/MS/MS. Samples collected prior to 2002 (Italy) or 2003 (Spain) were extracted by heating in a microwave oven with a mixture of triethylamine/water/acetonitrile. After filtration extracts were cleaned-up using C18 solid phase extraction cartridges. Final determination of metrafenone and CL 377160 was performed by HPLC/MS. The LOQ was 0.005 mg/kg for the Schwabenheim trials, and 0.02 mg/ kg for the Italian and Spanish trials for both methods of analysis.

The sum of total residue concentrations of metrafenone from all soil layers were calculated for the purposes of assessing the total soil accumulation of metrafenone. This was done by summing all quantified residue concentrations in individual soil layers. Where residues were < LOQ or a soil layer was not analyzed, a concentration of 0 mg/kg was assumed for that soil layer. Where residue concentrations were reported for the 0 – 5 cm and 5 – 10 cm layers, concentrations for these two layers were corrected by multiplying by 0.5, in order to make the concentrations reported for these 5 cm soil layers equivalent to those reported for the 10 cm soil layers. Total residue concentrations for metrafenone are summarized in Table A 8 and Table A 9. The total soil residue concentration of metrafenone in three of the four trials was observed to have reached a plateau by the study termination. In the case of the Schwabenheim cereal trial, a definitive judgement is complicated by the samples from 2004 which were lost and could not be analyzed. However, with the exception of the single sample taken 0+DAT11, comparison of equivalent sample concentrations from 2003 to 2005 indicated that a plateau had been reached, or only very small increases in total metrafenone concentrations had occurred over the two year period. The maximum accumulated metrafenone soil concentration of 0.65 mg/kg was observed in the upper 0 – 10 cm soil layer at the Italian trial immediately after the final application in the third season.

No quantifiable residues of metabolite CL 377160 were ever observed in any layer of any sample for three of the four studies, and in the Schwabenheim were only rarely observed in the 0 – 5 cm soil layer, with a maximum concentration in that soil layer of 0.007 mg/kg.

No residues of either metrafenone or its metabolite CL 377160 were observed above the LOQ in untreated plots in any trial, with the single exception of the 184+ DAT25 in the Italy trial, where the untreated plot contained apparent residues in the 10 – 20 cm soil layer of 0.03 mg/kg.

Table A 9: Total Residue Concentrations of metrafenone at the Schwabenheim vine and cereal soil accumulation trials

Year	Schwabenheim - Vine		Schwabenheim – Cereal	
	Sample	Total metrafenone (mg/kg)	Sample	Total metrafenone (mg/kg)
1999	0-DAT1	<0.005	0-DAT1	<0.005
	0+DAT1	<0.005	0+DAT1	0.009
	0-DAT4	0.039	0-DAT2	0.018
	0+DAT4	0.046	0+DAT2	0.024
	0-DAT8	0.162	-	-
	0+DAT8	0.155	-	-
2000	0-DAT9	0.114	0-DAT3	0.030
	0+DAT9	0.149	0+DAT3	0.049
	0-DAT12	0.197	0-DAT4	0.053
	0+DAT12	0.164	0+DAT4	0.064
	0-DAT16	0.172	154+DAT4	0.038
	0+DAT16	0.198	-	-
2001	0-DAT17	0.188	330+DAT4	0.034
	0+DAT17	0.216	-	-
	0-DAT20	0.180	-	-
	0+DAT20	0.166	-	-
	0-DAT24	0.240	-	-
	0+DAT24	0.257	-	-
2002	0-DAT25	0.224	0-DAT5	0.022
	0+DAT25	0.247	0+DAT5	0.071
	0-DAT28	0.207	0-DAT6	0.060
	0+DAT28	0.262	0+DAT6	0.088
	0-DAT32	0.305	-	-
	0+DAT32	0.270	-	-
2003	0-DAT33	0.315	0-DAT7	0.059
	0+DAT33	0.253	0+DAT7	0.169
	0-DAT36	0.230	0-DAT8	0.193
	0+DAT36	0.278	0+DAT8	0.192
	0-DAT40	0.256	56+DAT8	0.185
	0+DAT40	0.274	-	-
2004	0-DAT41	N/A	0-DAT9	N/A
	0+DAT41	N/A	0+DAT9	N/A
	0-DAT44	0.360	0-DAT10	N/A
	0+DAT44	0.380	0+DAT10	N/A
	0-DAT48	0.224	71+DAT10	0.136
	0+DAT48	0.256	-	-
	254+DAT48	0.240	-	-
2005	-	-	0-DAT11	0.065
	-	-	0+DAT11	0.245
	-	-	0-DAT12	0.179
	-	-	0+DAT12	0.206
	-	-	65+DAT12	0.140
	-	-	307+DAT12	N/A

N/A – Samples not analyzed

Table A 10: Total Residue Concentrations of metrafenone at the Sasso Morelli and Fuentiduena de Tajo bare soil accumulation trials

Year	Sasso Morelli, Italy – Bare soil		Fuentiduena de Tajo, Spain – Bare soil	
	Sample	Total metrafenone (mg/kg)	Sample	Total metrafenone (mg/kg)
1999	0-DAT1	<0.02	0-DAT1	<0.02
	0+DAT1	0.02	0+DAT1	0.05
	0-DAT8	0.14	0-DAT8	0.05
	0+DAT8	0.13	0+DAT8	0.09
	182+DAT1	0.05	183+DAT1	0.08
2000	0-DAT9	0.07	0-DAT9	0.03
	0+DAT9	0.10	0+DAT9	0.14
	0-DAT16	0.20	0-DAT16	N/A
	0+DAT16	0.29	10+DAT16	0.12
	175+DAT9	0.33	183+DAT9	0.04
2001	0-DAT17	0.11	0-DAT17	0.03
	0+DAT17	0.16	0+DAT17	0.08
	0-DAT24	0.66	0-DAT24	0.12
	0+DAT24	0.69	0+DAT24	0.13
	255+DAT17	0.12	181+DAT17	0.11
2002	0-DAT25	0.12	0-DAT25	0.07
	0+DAT25	0.16	0+DAT25	0.07
	0-DAT32	0.16	0-DAT32	0.13
	0+DAT32	0.31	0+DAT32	0.19
	184+DAT25	0.14	181+DAT25	0.07
2003	1-DAT33	0.18	1-DAT33	0.09
	0+DAT33	0.22	0+DAT33	0.11
	0-DAT40	0.31	0-DAT40	0.13
	0+DAT40	0.35	0+DAT40	0.19
	181+DAT33	0.13	182+DAT33	0.06
2004	0-DAT41	0.21	0-DAT41	0.02
	0+DAT41	0.27	0+DAT41	0.08
	1-DAT48	0.25	0-DAT48	0.07
	0+DAT48	0.31	0+DAT48	0.13
	182+DAT41	0.21	188+DAT41	0.04
	369+DAT41	0.13	375+DAT41	0.03

N/A – Samples not analyzed

MATERIAL AND METHODS

A. MATERIALS

Four soil accumulation studies were conducted; two at a site in Schwabenheim, Germany, on plots of approximately 477 - 480 m^2, and two in Southern Europe; at Sasso Morelli, Italy, and at Fuentiduena de Tajo, Spain, both on plots of 200 m^2. Untreated plots of similar dimensions acted as controls for each of the German trials, with the area of control plots in the Italian trial comprising half the area of the treated plot. Soil characteristics for the sites are shown in Table A 11.

Table A 11: Summary of the soil properties for the soil accumulation studies with metrafenone

Study	**Johnston 2006a**	**Johnston 2006b**	**Johnston 2006c**	**Johnston 2006d**
Location	**Schwabenheim, Germany**	**Schwabenheim, Germany**	**Sasso Morelli, Italy**	**Fuentiduena de Tajo, Spain**
Crop	Vines	Cereals	Bare soil	Bare soil
Soil characteristics:				
Soil Type (USDA)	Silt	Silt	Clay	Sandy loam
% Sand	15.4	14.8	4.0	52.0
% Silt	59.9	58.5	36.0	31.0
% Clay	24.7	26.7	60.0	17.0
% OM	4.41	3.73	2.1	0.4
% OC	2.56	2.17	1.2	0.2
pH ($CaCl_2$)	7.5	7.2	7.4*	8.0*
Cation Exchange Capacity (mEq/100g)	173	84.0	13.4	4.4
Maximum Water Holding Capacity (%)	48.9	44.7	35.4	12.9

*pH measured in 0.1N KCl

B. STUDY DESIGN

At the first Schwabenheim trial in Johnson 2006a, spray applications of a 500 g as/L SC formulation of metrafenone were made to vines, eight times every year, for 6 consecutive years (1999 – 2004 inclusive). Dose rates varied between 60 – 160 g as/ ha, with application rates generally increasing throughout the season. Applications were made from early May to late August, and between BBCH crop growth stages 13 – 87, with application intervals which varied, but were approximately 14 days.

For the second Schwabenheim trial reported in Johnson 2006b, spray applications of various SC formulations, containing 200 – 300 g as/ L metrafenone were applied to a field cropped with either wheat, barley or oilseed rape every year for seven years between 1999 and 2005 inclusive, with the exception of 2001, when no applications were made. Two spray applications were made per year at individual application rates of 200 g as/ ha, and between late April and early June, at BBCH growth stages 29 – 73. Application intervals varied but were usually approximately 14 days, with the exception of the applications made in 2002 and 2005, where the application interval was between 7 - 8 weeks.

For the Italian and Spanish trials reported in Johnson 2006c & 2006d, spray applications of different batches of an SC formulation, containing 300 or 500 g as/ L metrafenone, were applied to bare soil every year for six years between 1999 and 2004 inclusive. Eight spray applications were made per year at individual application rates of approximately 100 g as/ ha, and between early/mid-May and mid-/late August in the Italian trial, and mid-April/ mid-June to mid-July/mid-September in the Spanish trial. Application intervals varied but were approximately 14 days at both sites.

The actual formulations differed throughout the duration of the studies; however, this does not affect the fate and behaviour of the active substance. Actual application dates, rates, and crop growth stages at application are presented in Appendices 3.1 – 3.4 alongside measured soil residues.

Weather data for the trials at Schwabenheim were collected from the weather station at Schwabenheim 2 - 4 km from the trial sites in 1999, or from Frankfurt, 60 km from the trial site, thereafter. Weather data for the Italian trial were collected from the weather station at Casola Canina approximately 4.5 km from the trial site, and additionally in 2004, at S. Agata sul Santerno and Sasso Morelli 11.5 km and 1 km from the trial site respectively. Data for the Spanish trial were collected from the Madrid Aeropuerto weather station 50 km from the trial site. Weather patterns were considered normal in comparison to historical data.

Cultivation methods during the trials were according to good agricultural practice in those trials where crops were present, with the exception that at harvest crops were incorporated back into the soil/ worked in. No cultivation was performed for the Italian and Spanish bare soil trials.

Samples were collected in the form of 20 x 30 cm soil cores, from treated plots immediately prior to, and immediately after the 1st, 4th and 8th applications in a season for the Schwabenheim vine trial, and immediately pre- and post- both applications in a season to cereals. For the Italian and Spanish bare soil trials, samples were collected immediately before and after the 1st and 8th applications every season, with additional annual samples generally collected 180 days after the 1st treatment every season. A final sample was collected approximately 1 year after the 1st application in 2004.

At the Schwabenheim trials soil cores from the untreated plots were collected immediately prior to the 1st application every year. An additional sample was collected immediately after the last application in the final year at the Schwabenheim vine trial. At the Italian and Spanish bare soil trials untreated plot samples were collected annually before the first and last applications, and generally approximately 180 days after the first application in each year. An additional sample was collected approximately 1 year after the first application in 2004.

Additional soil samples from the Schwabenheim cereal trial were taken from both treated and untreated plots in the 2000/2001 season when no applications were made, and post-harvest in July 2003 and 2004, and August 2005, and in early April 2006. Straw samples were also collected at harvest in treated and untreated plots in 2000.

For all trials samples from untreated plots consisted of a total of 20 soil cores. For both Schwabenheim trials cores were collected from 3 - 5 different sub-plots, and for the vine trial all cores were collected from bare ground beneath the vine plant (i.e. in the ‘dripping zone’). All samples from all four trials were frozen at ≤ -18°C within 24 hours of collection prior to shipment to the analytical facility. Upon receipt at the analytical facility samples were stored frozen at ≤ -18°C until analysis.

For the Schwabenheim trial site soil cores collected in 1999 and 2000 were divided into 10 cm segments and the upper layer analyzed for residues of metrafenone and its photolytic soil metabolite CL 377160. If positive residues at or above the limit of quantitation (LOQ) were detected in the uppermost layer, the 10 to 20 cm layer was analyzed. If there were no detectable residues above the LOQ in the 0-10 or 10-20 cm layers, the following soil layer was not analyzed. Specimens collected in 2001 onwards were separated into 0-5 cm, 5-10 cm, 10 – 20 cm, and 20 – 30 cm soil layers. All soil samples were definitively analyzed by method M3441 (modified). Samples were extracted by vortexing, firstly with acetonitrile, and then with triethylamine/water/acetonitrile. After centrifugation aliquots of extracts were combined, and further centrifuged and filtered prior to analysis by LC/MS/MS, with quantification by comparison to external standards. The LOQ was 0.005 mg/kg.

For the Italian bare soil trial, soil cores collected in 1999 – 2001, and for the Spanish trial soil cores collected in 1999 – 2002, were divided into 10 cm segments, analyzed with the same procedure described for the Schwabenheim trials, and utilizing the method RLA 12618V. In brief; samples were extracted by heating in a microwave oven with a mixture of triethylamine/water/acetonitrile. After filtration extracts were cleaned-up using C18 solid phase extraction cartridges. Final determination of metrafenone and CL 377160 was performed by HPLC/MS, with quantification by comparison to external standards. Samples collected from 2002 (Italy) or 2003 (Spain) onwards were separated into 0 - 5 cm, 5 – 10 cm, 10 – 20 cm, and 20 – 30 cm soil layers and analyzed with the method M3441 (modified) method described above. The stated LOQ for all samples was 0.02 mg/kg.

Straw specimens from the Schwabenheim cereal trial were analyzed for residues of metrafenone and the metabolites CL 3000402, CL 376991 and CL 434223 with method RLA 12560.00. Straw samples were extracted with (80:20) methanol: water, filtered, cleaned-up with an anion exchange cartridge, with final analysis by LC/MS. The LOQ was 0.10 mg/kg.

RESULTS AND DISCUSSION

Results for the analysis of soil cores taken from the treated plots in the soil accumulation studies are presented in Appendices 3.1 – 3.4. together with full details of the applications made. The sum of total residue concentrations of metrafenone from all soil layers have been calculated for the purposes of assessing the total soil accumulation of metrafenone. This was done by summing all quantified residue concentrations in analyzed soil layers. Where residues were < LOQ or a soil layer was not analyzed, a concentration of 0 mg/kg was assumed for that soil layer. Where residue concentrations were reported for the 0 – 5 cm and 5 – 10 cm layers, concentrations for these two layers were corrected by multiplying by 0.5, in order to make the concentrations reported for these 5 cm soil layers equivalent to those reported for the 10 cm soil layers.

In the Schwabenheim vine trial quantifiable residues of metrafenone were found in the upper soil layer prior to the 4th application of metrafenone in the first season, but were not observed in lower soil layers until the second season's application. By study termination, regular but low concentrations of metrafenone were observed in the 20 – 30 cm soil layer. The maximum concentration in this layer was 0.026 mg/kg immediately after the 4th application made in the 5th season. The total residue concentration of metrafenone was observed to have reached a plateau by the study termination by virtue of the comparison of total residues before and after the final application in the seasons. No quantifiable residues of metabolite CL 377160 were ever observed in any layer of any sample over the 6 year study period.

In the Schwabenheim cereal trial quantifiable residues of metrafenone were found in the upper soil layer immediately after the 1st application of metrafenone in the first season, but were not observed in the 10 – 20 cm soil layer until the fifth season. Quantifiable concentrations of metrafenone were never observed in the 20 – 30 cm soil layer. With the exception of the single sample taken 0+DAT11 comparison of equivalent sample total residue concentrations from 2003 to 2005 indicated that a plateau had been reached, or only very small increases in total metrafenone concentrations were occurring. Comparison could not be made to samples collected in 2004, since those samples were lost. The study could not be extended beyond the 6 year duration because there was not enough room remaining in the plots to collect undisturbed soil samples in an unbiased manner. Only sporadic quantifiable residues of metabolite CL 377160 were observed in 0-5 cm soil layers over the 6 year study period. The maximum concentration was 0.007 mg/ kg in the sample taken 71 DAT10, with quantifiable concentrations of 0.005 mg/ kg also observed 0-DAT12 and 0+DAT12. Quantifiable residues of CL 377160 were never observed above the LOQ below the 0 – 5 cm soil layer. A metrafenone concentration of 1.32 mg/kg straw was reported in the sole straw sample analyzed. No metabolites were observed above the LOQ in straw.

In the Italian bare soil trial quantifiable residues of metrafenone were found in the upper soil layer after the first application of metrafenone in the first season, but were not observed in the 10 – 20 cm soil layer until after the 8th application in the second season. Quantifiable concentrations of metrafenone were only observed once in the 20 – 30 cm soil layer (0.04 mg/kg 175 DAT16). Total metrafenone concentrations were observed to have plateaued by the end of year 3 by virtue of the measured soil concentration immediately after the final application, and by the end of the 4th season's application by virtue of the sample taken 180 days after the first treatment in a season. The maximum concentration in the upper soil layer immediately after the final application was 0.65 mg/kg in the 3rd season. No quantifiable residues of metabolite CL 377160 were ever observed in any layer of any sample over the 6 year study period.
In the Spanish bare soil trial quantifiable residues of metrafenone were found in the upper soil layer after the first application of metrafenone in the first season, but were never observed above the LOQ in the 10 – 20 cm soil layer. In the final two years of the trial when the 0 - 5 cm and 5 – 10 cm soil layers were analyzed separately, only low residues were observed in the 5 – 10 cm layer (< 0.02 mg/kg – 0.06 mg/kg) confirming that the vast majority of un-metabolized metrafenone remained in the upper soil layer.

Total metrafenone concentrations were observed to have plateaued by the end of year 3 by virtue of the measured soil concentration approximately 180 days after the first treatment of the season, and by the end of the 4th season's application by virtue of the samples taken immediately after the last application made in a season. The maximum concentration in the upper soil layer immediately after the final application was 0.33 mg/kg for the 0 – 5 cm layer in the 5th season. No quantifiable residues of metabolite CL 377160 were ever observed in any layer of any sample over the 6 year study period.

No residues of either metrafenone or its metabolite CL 377160 were observed above the LOQ in untreated plots in any trial, with the single exception of the 184+ DAT25 in the Italy trial, where the untreated plot contained apparent residues in the 10 – 20 cm soil layer of 0.03 mg/kg.

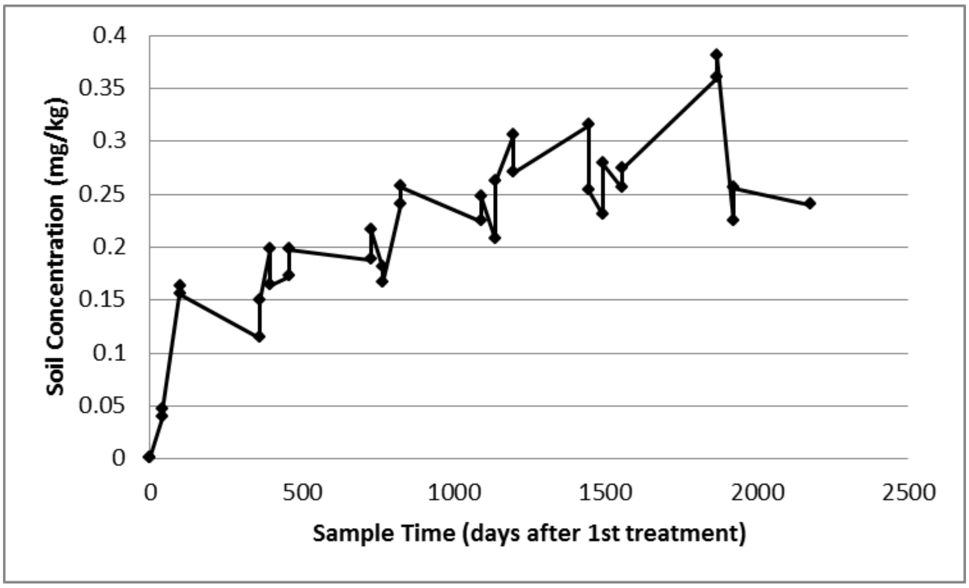


Figure A 1: **Concentrations of metrafenone in soil in the soil accumulation study at Schwabenheim, Germany following application of metrafenone to vines**

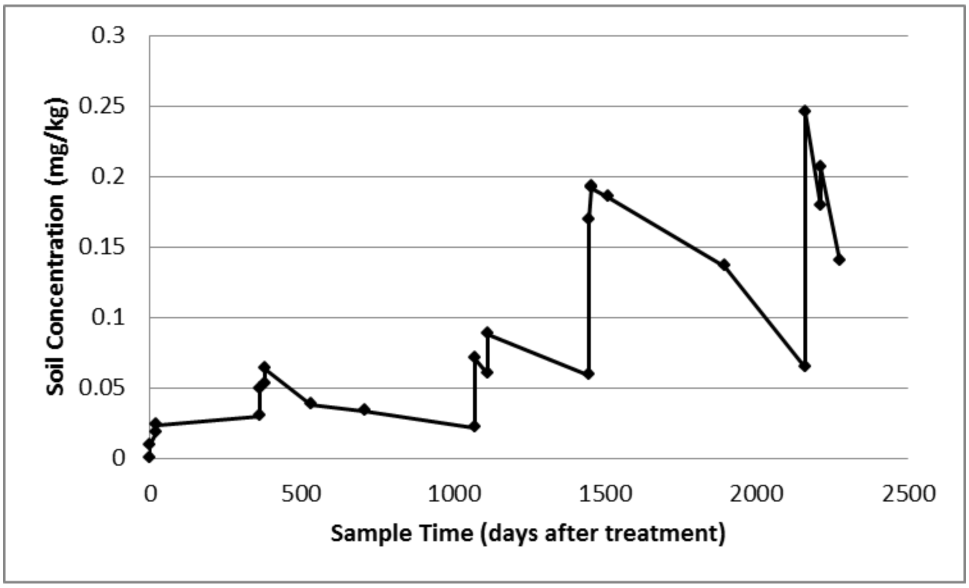


Figure A 2: **Concentrations of metrafenone in soil in the soil accumulation study at Schwabenheim, Germany following application of metrafenone to cereals**

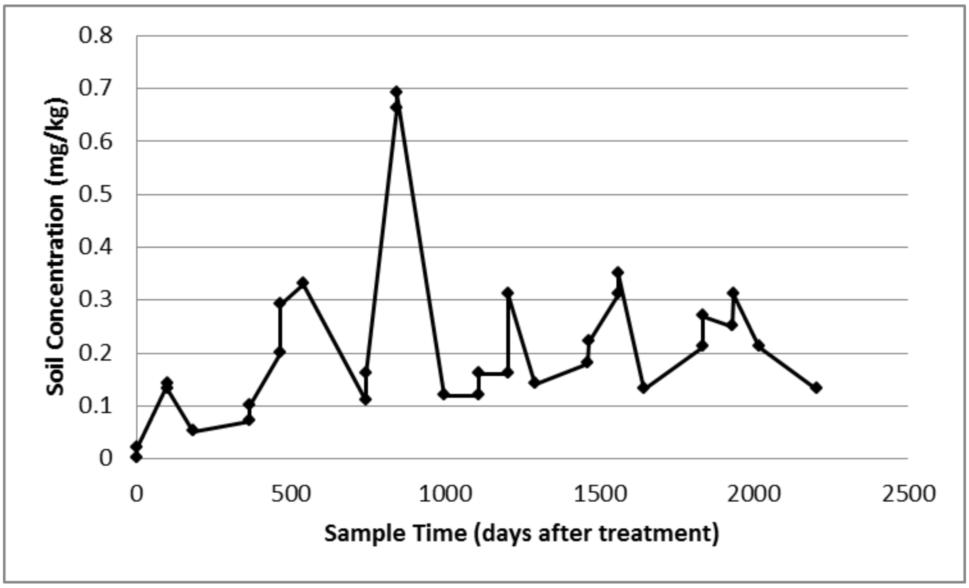


Figure A 3: **Concentrations of metrafenone in soil in the bare soil accumulation study at Sasso Morelli, Italy**

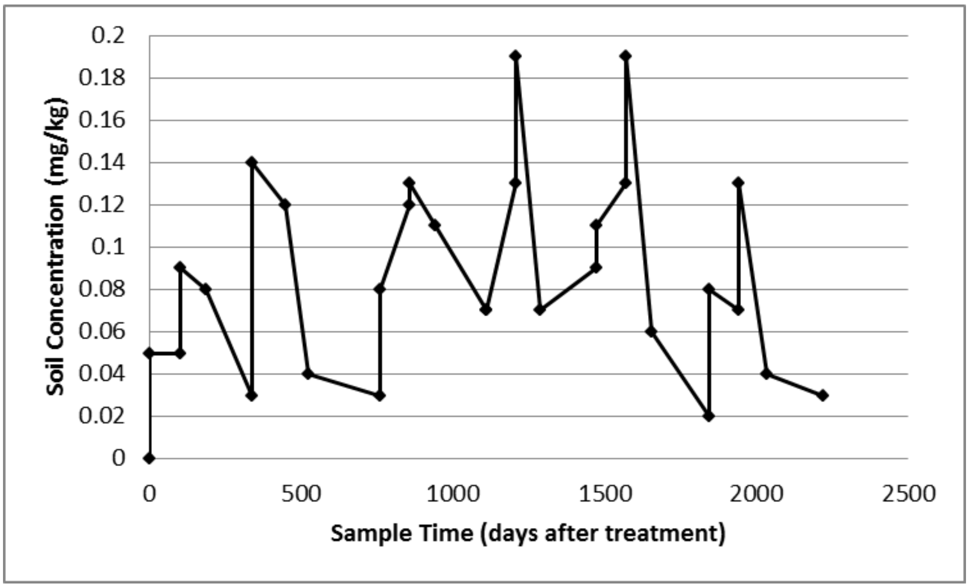


Figure A 4: **Concentrations of metrafenone in soil in the bare soil accumulation study at Fuentiduena de Tajo, Spain**

CONCLUSIONS

The total soil residue concentration of metrafenone in three of the four trials was observed to have reached a plateau by the study termination. In the case of the Schwabenheim cereal trial with the exception of the single sample taken 0+DAT11, comparison of equivalent sample concentrations from 2003 to 2005 indicated that a plateau had been reached, or only very small increases in total metrafenone concentrations had occurred over the two year period. The maximum accumulated metrafenone soil concentration of 0.65 mg/kg was observed in the upper 0 – 5 cm soil layer at the Italian trial immediately after the final application in the third season.

No quantifiable residues of metabolite CL 377160 were ever observed in any layer of any sample for three of the four studies, and in the Schwabenheim were only rarely observed in the 0 – 5 cm soil layer, with a maximum concentration in that soil layer of 0.007 mg/kg.

No residues of either metrafenone or its metabolite CL 377160 were observed above the LOQ in untreated plots in any trial, with the single exception of the 184+ DAT25 in the Italy trial, where the untreated plot contained apparent residues in the 10 – 20 cm soil layer of 0.03 mg/kg.

A 2.5 CP 9.2/1: 2012/1021122

Comments of zRMS:	The submitted report was evaluated in 2019. The kinetics analysis was performed in accordance with FOCUC kinetics. The statistics analysis was presented. **DT_{50} water = 7.50 d** **DT_{50} sediment = 6.48 d** These endpoints were used in exposure assessment.

Reference:	CP 9.2/1
Report	Kinetic evaluation of BAS 500 F in water/sediment systems under aerobic conditions, Miles B., 2012 report No: CALC-1582 (BASF SE) BASF DocID 2012/1021122 Authority registration No
Guideline(s):	FOCUS Kinetics Report SANCO/10058/2005 ver. 2.0
Deviations:	No
GLP:	No, not necessary with this type of study.
Acceptability:	Yes

EXECUTIVE SUMMARY

Kinetic evaluations of an irradiated water/sediment study were carried out according to the FOCUS kinetics recommendations to determine modeling endpoints for BAS 500 F. In the laboratory study the degradation of pyraclostrobin was investigated over a period of 62 days in one water/sediment system (Kellmetschweiher, a pond close to Schifferstadt, Germany). Two radio-labels of the active substance were used in the study and were treated as replicates for the kinetic evaluation. The experimental data were evaluated using single first order (SFO) kinetic models at levels P-I, P-II and M-I. In addition to the parent compound, the metabolites BF 500-3, BF 500-11, BF 500-13 and BF 500-14 were considered.

MATERIAL AND METHODS

Kinetic analysis

The kinetic analysis was carried out following the recommendations of the FOCUS work group on degradation kinetics [*FOCUS (2006) Guidance Document on Estimating Persistence and Degradation Kinetics from Environmental Fate Studies on Pesticides in EU Registration. Report of the FOCUS Work Group on Degradation Kinetics, EC Document Reference Sanco/10058/2005 version 2.0, 434 pp*] in order to derive modeling aquatic degradation endpoints. The analysis was done by non-linear regression methods (Marquardt algorithm, ordinary least squares optimization) using the KinGUII (version 2.2011 [*Schäfer, D., Mikolasch, M., Rainbird, P., Harvey, B. (2007) KinGUII: A new kinetic software tool for evaluations according to FOCUS Degradation Kinetics. In: Del Re, A.A.M. et al. (Eds.): Proceedings of the XIII Symposium on Pesticide Chemistry, Piacenza, 2007, p. 916-923. - BASF DocID 2007/1062781*]) and ModelMaker (version 3.0.4 [*ANONYMOUS (1997) Model Maker User Manual, Version 3. Cherwell Scientific Publishing Limited.*]) software packages.

Experimental data

The kinetic evaluation was based on the results of an irradiated aerobic water/sediment study [see *EU Dossier BAS 500 F, A II, M 7.2.1.3.2/2: Ebert (1999d) – BASF DocID 1999/11791*] where the degradation of BAS 500 F was investigated over a period of 62 days in one water/sediment system (Kellmetschweiher, a pond close to Schifferstadt, Germany). The characteristics of the test system are described in *Ebert (1999d)*.

Model input data

Two radio-labels of the active substance, referred to as Chlorophenyl- and Tolyl-label respectively, were used in the study. The test vessels were treated with 250 µg l^{-1} of solution containing either 245 µg of Chlorophenyl-label or 217.5 µg of Tolyl-label to represent an application rate of 500 g a.s. ha^{-1}. The test system was incubated under a temperature and light regime simulating the climate of central Europe for the period mid-May to mid-July. The two radio-labels were tested separately and were therefore considered in the kinetic evaluation as replicates for each sampling time. In the study the concentrations of the parent compound pyraclostrobin and five metabolites (BF 500-3, BF 500-11, BF 500-12, BF 500-13 and BF 500 14) were determined as % Total Applied Radiation (TAR). Metabolite BF 500-12, however, was not evaluated because the total occurrence in water and sediment was below 5% of TAR. The sampling times were for the water compartment 0, 0.125, 0.25, 0.375, 1, 2, 3, 7, 10, 14, 21, 30, 45 and 62 Days After Treatment (DAT) and for sediment 1, 3, 7, 14, 30, 45 and 62 DAT. The experimental data used as model input values for the kinetic evaluations are given in Table A 12.

Table A 12: Model input for pyraclostrobin and metabolites

Time [d]	Concentration [% Total Applied radioactivity]										
	BAS 500 F			BF 500-3		BF 500-11		BF 500-13		BF 500-14	
	Wat	Sed	Sys	Sed	Sys	Wat	Sys	Wat	Sys	Wat	Sys
0	88.0*				2.2**					0.3	0.3**
0	89.4*				2.4**	0.2	0.2**		0.0	0.1	0.1**
0.125	80.7									1.5	
0.125	84.0					0.9				1.3	
0.25	79.3									1.5	
0.25	82.4					1.1				1.4	
0.375	75.0									2.2	
0.375	75.5					1.2				1.7	
1	69.1	9.5	78.6	0.7	3.6					3.9	4.0
1	68.7	8.9	77.6	0.6	3.2	2.1	2.1	0.4	0.4	2.7	2.8
2	58.2									5.9	
2	61.0					3.7		0.6		4.7	
3	46.2	15.6	61.8	1.6	4.5					9.0	9.4
3	51.0	15.0	66.0	1.4	4.4	5.7	5.7	1.2	1.3	6.6	6.9
7	28.3	17.5	45.8	4.1	6.6					10.4	11.1
7	34.2	18.3	52.5	4.0	6.7	7.8	7.9	2.2	2.6	8.5	9.0
10	14.9									11.1	
10	17.3					10.4		3.7		10.8	
14	12.5	9.7	22.2	10.0	11.9					11.4	12.1
14	14.0	6.4	20.4	12.4	14.8	10.3	10.5	4.1	4.9	9.7	10.3
21	3.8									8.1	
21	5.4					11.4		7.0		8.6	
30	0.7	0.8	1.5	15.9	19.2					4.2	4.7
30	2.1	0.9	3.0	16.9	21.9	10.5	10.8	10.5	12.3	5.6	6.0
45		0.4	0.4	13.2	16.3					2.8	3.5
45	0.8	0.5	1.3	14.3	19.0	5.5	6.0	14.0	16.1	2.3	2.9
62		0.3	0.3	12.2	15.7					1.6	2.1
62	0.9	0.3	1.2	12.7	16.8	3.9	4.5	15.7	17.6	1.7	2.2

Wat = water compartment
Sed = sediment compartment
Sys = total system (water + sediment compartments)

Chlorophenyl label
Tolyl label

* Total water concentration (parent + metabolites + unknowns)
** Set to zero for evaluation of $DegT_{50}$ at level M-I

Kinetic modeling strategy

Kinetic evaluations were performed for pyraclostrobin and four of its metabolites considering the different levels proposed by the FOCUS kinetics guidance [*FOCUS (2006)*]. For the parent substance, the analysis at P-I level (one-compartment approach) was done for degradation in the whole system as well as the respective dissipations from the water and sediment phases of the test system. At the P-II level (two-compartment approach), the kinetic analysis considered the degradation in water and sediment taking into account the partitioning between the two phases.

For the metabolites, dissipation calculations were performed at level M-I, although the considered radio-labels and system compartments differed for each metabolite.

As the purpose of the present study was to derive modeling endpoints, only the single first order (SFO) kinetic model was considered as long as acceptable results were obtained in line with the FOCUS Kinetics guidance, p. 51 (Box 5-1) [*FOCUS (2006)*].

Level P-I kinetic analysis

Level P-I kinetic analysis was performed for the parent substance in the water and sediment compartments and in the total system. As the purpose of the present study was to derive modeling endpoints, only the single first order (SFO) kinetic model was considered. The evaluation was carried out using the KinGUII software version 2.2.

Level P-II kinetic analysis

The kinetic concept and model definition for the P-II level analysis is shown in the FOCUS Kinetics guidance, p. 199 (Box 10-2) [*FOCUS (2006)*]. Degradation in both water and sediment compartments was considered as well as partitioning between the two phases for the parent compound. As per the FOCUS guidance, degradation in both compartments was modeled with the SFO kinetic model.

The models were implemented in ModelMaker by means of a compartment model, considering the underlying equations defined in the FOCUS kinetics guidance document.

Level M-I kinetic analysis

Level M-I kinetic analysis was performed for dissipation and degradation of the metabolites BF 500-3, BF 500-11, BF 500-13 and BF 500-14. Depending on the occurrence of the metabolites in the compartments, dissipation rates (DT_{50}) were calculated for water, sediment and the total system water and sediment. Degradation rates ($DegT_{50}$) were calculated for the total system. The metabolite kinetics were described with the SFO kinetic model. The concept for the evaluation of the degradation rates for the complete system is shown in the FOCUS Kinetics guidance, p. 224 (Box 10-4) [*FOCUS (2006)*]. The concept for the evaluation of the dissipation rates from either a single compartment or the complete system is shown in the FOCUS Kinetics guidance, p. 219 (Box 10-3). For the evaluation of dissipation rates the time of the maximum measured occurrence of the metabolite considered is set as the initial time (t=0) and the subsequent times are adjusted accordingly.

The dissipation kinetics were evaluated for the metabolites BF 500-11, and BF 500-14 in the water compartment and for BF 500-3 in the sediment compartment, and for all three metabolites in the total system. Degradation kinetics for the water-sediment system were evaluated for the metabolites BF 500-3, BF 500-11, and BF 500-14. For the compartments which were not evaluated for the respective metabolites either there was no clear maximum occurrence during the study or the number of data points was insufficient for an evaluation for the compartment. The metabolite BF 500-13 could not be evaluated in either compartment.

The data used for the evaluations depended in each case on the occurrence of the radio labels in the metabolite in question. For BF 500-11 and BF 500-13 only data for the Tolyl label were available, while for BF 500-14 and BF 500-3 replicate data for the Tolyl and Chlorophenyl labels could be used.

The M-I kinetic evaluations were carried out using the KinGUII software version 2.2.

Goodness of fit statistics

The goodness-of-fit of the model was evaluated both visually and statistically as recommended by the FOCUS Kinetics workgroup [*FOCUS(2006)*].

Visual assessment of the model fit, considering the concentration time curve as well as the residual plots, is the main indicator for the appropriateness of a kinetic model. In addition, the decision on the best kinetic model is supported by the value of the error parameter of the χ^2 statistical model [see Equation A 6]. The kinetic model with the lower error level is usually preferred. For this specific evaluation, the χ^2 error was calculated using the mean of the replicates when available.

Equation A 6 Model error

$$error = 100 \cdot \sqrt{\frac{1}{\chi^2_{tabulated}} \cdot \sum \frac{(C-O)^2}{\bar{O}^2}}$$

where	error	model error at which χ^2 test is passed
	$\chi^2_{tabulated}$	tabulated value of χ^2 distribution (m, α)
	C	calculated value
	O	observed value
	$\bar{O}$	average of all observed values

T-test and confidence intervals

From a statistical point of view, the significance of an estimated value for a given parameter must be assessed. If a parameter is not significantly different from zero, then the parameter is either very uncertain due to variability in the data, or the model is not adequate with respect to the data. This confidence can be established using the Student's test, also known as t-test.

In this evaluation, t-tests were performed for all relevant parameters following the FOCUS Kinetics guidance, either directly in the KinGUII software or via the Excel sheet FOCUS_DEGKIN_v2 for the results provided by ModelMaker at P-II level.

Establishment of modeling endpoints

The objective of a kinetic evaluation is to select appropriate kinetic models in order to deduce degradation endpoints from their respective calculations. These degradation endpoints, namely the DT_{50} and DT_{90} parameters from dissipation and the $DegT_{50}$ and $DegT_{90}$ for degradation, are established differently whether (i) one considers these parameters to assess if further persistence studies are needed (persistence endpoints) or (ii) one plans to use them as inputs for pesticide fate models (modeling endpoints). As the purpose of the present study was to determine endpoints for modeling only, the persistence endpoints are not considered here. As defined in the FOCUS guidance, for modeling endpoints, if the SFO model is deemed sufficiently descriptive then the corresponding DT_{50} parameter is taken as it is.

Data handling

When possible, replicate measurements (chlorophenyl- and tolyl-label) for each time point were used in the parameter estimation for the parent compound. While the sampling times can be equal for synchronous replicates in KinGUII, for technical reasons they were entered in ModelMaker with a small time offset (0.0001 days). The impact of this time offset on the calculated kinetics is however negligible.

Degradation in the whole system and dissipation from the water compartment of the parent compound (P-I level) were evaluated starting at DAT 0. The dissipation of the parent from the sediment phase (P-I level) was evaluated starting from the point of maximum occurrence. For the P-II level, the initial concentration of the sediment compartment was assumed to be zero. The FOCUS Kinetics guidance recommends using the material balance at DAT 0 as the initial value for the parent substance. However, in the degradation study the first measurement for the sediment was taken after 1 day, so a complete material balance for DAT 0 was not available. Instead the total measured occurrence of the radioactive labels in water (parent + metabolites + unknowns) was used as the initial value for the parent. It can be assumed that this will be lower than the actual mass balance at DAT 0, which means that using these values in the parameter estimation will result in conservative values for the degradation rates.

At the M-I level, the dissipation calculations were conducted from the point of maximum occurrence of the considered metabolite, with the time of maximum occurrence set as the initial time (t=0) in the evaluation and the subsequent observation times corrected accordingly. For the degradation, the recovered amount of the parent substance at DAT 0 was set equal to the total measured occurrence of the radioactive labels in water (parent + metabolites + unknowns) and the initial concentration of the metabolites was fixed to zero.

The model input values for the kinetic evaluations of all the mentioned substances are given in Table A 12.

RESULTS AND DISCUSSION

Kinetic evaluation of pyraclostrobin: P-I level

The results of the kinetic evaluation of the parent substance at the P-I level (SFO-kinetic model) are summarized in Table A 13 to Table A 15. The detailed reports and graphical outputs of this evaluation can be found in the study report.

Table A 13: Evaluation of SFO kinetic models for pyraclostrobin at P-I level

	Number of measurements used for fitting	χ^2 error	Visual fit
BAS 500 F Whole system	16	4.568	Excellent
BAS 500 F Water	24	5.346	Excellent
BAS 500 F Sediment	8	3.300	Excellent

The dissipation in the water and sediment compartments and the total system degradation could be well described by the SFO kinetic model without apparent significant systematic deviations in the residual errors. The fitted parameter values with their associated statistical attributes are given in Table A 13 and the resulting modeling endpoints are given in Table A 14.

Table A 14: Fitted parameter values and statistical assessment for pyraclostrobin at P-I level

	Parameter	Estimated value	Std error	type l error rate
BAS 500 F Whole system	M(0)	87.65	1.42	<0.001
	k	9.60E-02	4.27E-03	<0.001
BAS 500 F Water	M(0)	83.18	0.94	<0.001
	k	0.155	6.89E-03	<0.001
BAS 500 F Sediment	M(0)	17.93	0.63	<0.001
	k	0.117	1.07E-02	<0.001

Table A 15: Modeling endpoints for pyraclostrobin at P-I level

	DT_{50} [days]	$DegT_{50}$ [days]
BAS 500 F Whole system		7.22
BAS 500 F Water	4.47	
BAS 500 F Sediment	5.93	

Kinetic evaluation of pyraclostrobin: P-II level

The parent substance degradation into the water and sediment compartments, taking into account the equilibrium between the two phases, was modeled following the FOCUS Kinetics guidance.

The results of the assessment for each compartment, along with the estimated values of the parameters (the usual kinetic parameters and the descriptors of the equilibrium $r_{w \rightarrow s}$, the transfer from water to sediment, and $r_{s \rightarrow w}$, the transfer from sediment to water) are given in Table A 16. The detailed reports and graphical outputs of this evaluation can be found in the study report.

Table A 16: Evaluation of SFO kinetic model for pyraclostrobin at P-II level with fitted parameter values

	χ^2 error	Visual fit	Parameter	Estimated value	Std error	type l error rate
BAS 500 F – Water	3.0	Good	M(0)	87.71	1.13	<0.001
			k_{water}	9.24E-02	1.64E-02	<0.001
			$r_{w \rightarrow s}$	0.143	1.45E-02	<0.001
BAS 500 F – Sediment	12.0	Good	M(0)	Fixed to 0		
			k_{sed}	1.07E-01	4.22E-02	0.011
			$r_{s \rightarrow w}$	0.227	4.68E-02	<0.001

Good visual fits were obtained with SFO kinetics for both the water and sediment compartments. The Chi² error was higher for the sediment than for the water compartment, but both are acceptable (< 15%). The standard errors are low for all of the estimated parameters and the t-test is passed in all cases. Repeating the optimization with different starting values did not result in a change in the estimated values, indicating that these values are likely to represent a global minimum.

The F_{sed} test results, where the plausibility of the transfer rates between water and sediment are checked [*FOCUS(2006)*], are presented together with the parameter values used for the test in Table A 17. As the K_{oc} value for pyraclostrobin with the Kellmetschweiher sediment was not determined in the study, the average value from two soils with comparable OC content and particle size distributions determined in an adsorption/desorption study for the compound [see *EU Dossier BAS 500 F, A II, M 7.1.2/1: Ziegler G. (1998a) – BASF DocID 1998/10650*] was used. The F_{sed} test is passed, showing that the estimated parameter values for the transfer rates are plausible. As a further plausibility check for the P-II evaluation, the total system degradation half-life ($DegT_{50}$) was estimated from the total calculated degradation for the two compartments. This crosscheck yields a $DegT_{50}$ of 7.25 – 7.5 days, which is consistent with the value of 7.22 days for total system degradation obtained in the P-I evaluation.

The results obtained for the SFO-Kinetic model at the P-II level can be considered acceptable and the estimated degradation rates used as modeling endpoints. The $DegT_{50}$ values are given in Table A 18.

Table A 17: F_{sed} test for pyraclostrobin for transfer rates fitted at P-II level.

Parameter	Value	Description
K_{oc} [L kg^{-1}]	6750	Koc for BAS 500 F in sandy sediment with low OC*
OC [%]	0.4	organic carbon of sediment
kd [L kg^{-1}]	30	sorption coefficient of sediment
rho_b [kg L^{-1}]	1.606	dry bulk density of sediment (derived from OC and clay content according to [*Beltman, W.H.J, Ter Horst, M.M.S, Adriaanse, P.I., De Jong, A. (2006) Manual of FOCUS_TOXSWA version 2.2.1. Wageningen, Alterra, Alterra-rapport 586. 198 pp.]*
theta [-]	0.25	saturated volumetric water content of sediment^{+}
Z_{wc} [cm]	15	height of water column
Z_{sed} [cm]	1.5	height of sediment column
D_L [cm^2 d^{-1}]	0.432	recommended default value
f [-]	0.500	tortuosity factor (calculated)
t [d]	62	duration of experiment
F_{sed} theoretical range:		
F_{sed} min	0.36	
F_{sed} max	0.69	
F_{sed} model:	0.39	$= r_{ws} / (r_{ws} + r_{sw})$

* Mean value for sediments with comparable OC and particle size distributions [Ziegler (1998)]

$^{+}$ Estimated from sediment mass of 300 g and volume in container of ca. 150 ml, assuming mineral density 2.65 g/cm³ for quartz sand grains.

Table A 18: Modeling endpoints for pyraclostrobin at P-II level

	$DegT_{50}$ [days]
BAS 500 F Water	7.50
BAS 500 F Sediment	6.48

Kinetic evaluation of the metabolites BF 500-3, BF 500-11, BF 500-13 and BF 500-14: M-I level

Both dissipation and degradation of the metabolites were studied at the M-I level according to the FOCUS guidance.

As for the P-I evaluations, the data used for the evaluations depended in each case on the occurrence of the radio labels in the metabolite in question. The data used for the evaluations are given in Table A 12.

Dissipation of the metabolites

The dissipation kinetics were evaluated for the metabolites BF 500-11 and BF 500-14 in the water compartment and for BF 500-3 in the sediment compartment, and for all three metabolites in the complete system.

The evaluation reports and graphical outputs provided by KinGUII for the dissipation of the metabolites can be found in the study report. Table A 19 and Table A 20 present respectively the results of the assessment for the dissipation of the metabolites and the values of the estimated parameters.

The dissipation in the water and sediment compartments for the metabolites could be adequately described by the SFO kinetic model without apparent significant systematic deviations in the residual errors and with the t-test passed in all cases. The evaluation results were similar for the total system, with the exception of the metabolite BF 500-11. For this metabolite the type 1 error rate of 0.07 slightly exceeds the normally applied limit of 0.05, meaning that the degree of certainty that the calculated degradation rate is different from zero is very slightly lower than would normally be accepted. In this case however, on the basis of the visual fit which clearly indicates degradation with a reasonable model fit for the calculated parameters – albeit with a small number of data points – it was decided to accept the calculated value for the degradation rate. The resulting modeling endpoints are given in Table A 21.

Table A 19: Evaluation of SFO kinetic models for metabolite dissipation at M-I level

	Number of measurements used for fitting	χ^2 error	Visual fit
BF 500-3 Sediment	6	1.74	Good
BF 500-3 System	6	1.56	Good
BF 500-11 Water	4	7.62	Medium
BF 500-11 System	3	6.41	Good
BF 500-14 Water	10	5.16	Good
BF 500-14 System	8	5.30	Good

Table A 20: Fitted parameter values and statistical assessment for metabolite dissipation at M-I level

	Parameter	Estimated value	Std error	type I error rate
BF 500-3 Sediment	M(0)	16.20	0.44	<0.001
	k	8.82E-03	1.51E-03	0.002
BF 500-3 System	M(0)	20.31	0.98	<0.001
	k	7.49E-03	2.59E-03	0.022
BF 500-11 Water	M(0)	11.96	0.90	0.003
	k	2.75E-02	5.38E-03	0.018
BF 500-11 System	M(0)	10.57	0.86	0.026
	k	3.06E-02	6.81E-03	0.070
BF 500-14 Water	M(0)	10.69	0.44	<0.001
	k	4.37E-02	4.15E-03	<0.001
BF 500-14 System	M(0)	11.04	0.53	<0.001
	k	4.01E-02	4.22E-03	<0.001

Table A 21: Modeling endpoints for metabolite dissipation evaluated at M-I level

	DT_{50} [days]
BF 500-3 Sediment	78.55
BF 500-3 System	92.54
BF 500-11 Water	25.22
BF 500-11 System	22.62
BF 500-14 Water	15.88
BF 500-14 System	17.29

Degradation of the metabolites

Evaluations of the degradation kinetics of BF 500-3, BF 500-11 and BF 500-14 were carried out for the water-sediment system. In contrast to the dissipation kinetics, in which only the metabolites are considered from the point of maximum occurrence, in the evaluation of the degradation kinetics both parent and metabolite are considered using all data points from DAT = 0 onwards.

The evaluation reports and graphical outputs provided by KinGUII for the degradation of the metabolites can be found in the study report. Table A 22 and Table A 23 show the results of the assessment of the degradation for both parent and metabolites for each calculation.

Table A 22: Evaluation of SFO kinetic models for metabolite degradation at M-I level

Metabolite		χ^2 error	Visual fit
BF 500-3	BAS 500 F – Whole system	4.72	Good
	BF 500-3 – Whole system	12.64	Medium
BF 500-11	BAS 500 F – Whole system	4.70	Good
	BF 500-11 – Whole system	9.23	Good
BF 500-14	BAS 500 F – Whole system	4.70	Good
	BF 500-14 – Whole system	13.50	Good

Table A 23: Fitted parameter values and statistical assessment for metabolite degradation at M-I level

Metabolite		Parameter	Estimated value	Std error	type l error rate
BF 500-3	BAS 500 F – Whole system	M(0)	87.42	1.42	<0.001
		k	9.47E-02	4.321e-03	<0.001
	BF 500-3 – Whole system	k	2.35E-03	2.40E-03	0.168
BF 500-11	BAS 500 F – Whole system	M(0)	87.65	1.45	<0.001
		k	9.60E-02	4.48E-03	<0.001
	BF 500-11 – Whole system	k	3.03E-02	3.47E-03	<0.001
BF 500-14	BAS 500 F – Whole system	M(0)	87.68	1.42	<0.001
		k	9.62E-02	4.50E-03	<0.001
	BF 500-14 – Whole system	k	8.44E-02	1.26E-02	<0.001

The formation and degradation of BF 500-3 in this evaluation could not be adequately reproduced by the SFO model, with the type I error rate of 0.168 significantly exceeding the usually applied limit of 0.05. The model generally overestimates the concentrations in the early stages of the simulation, but underestimates maximum occurrence concentrations. There was no justification to remove any points as experimental outliers.

For the remaining two metabolites however the formation and degradation in the water-sediment system could be adequately described by the SFO kinetic model, with the t-test passed in all cases. The resulting modeling endpoints are given in Table A 24. As degradation rate for the metabolite BF 500-3 could not be adequately determined no endpoint is given here.

Table A 24: Modeling endpoints for metabolite system degradation evaluated at M-I level

	$DegT_{50}$ [days]
BF 500-11	22.90
BF 500-14	8.21

CONCLUSIONS

Kinetic evaluations of an irradiated water/sediment study were carried out according to the FOCUS kinetics recommendations to determine modeling endpoints for pyraclostrobin. The experimental data were evaluated using single first order (SFO) kinetic models at levels P-I, P-II and M-I. In addition to the parent compound, the metabolites BF 500-3, BF 500-11, BF 500-13 and BF 500-14 were considered.

Level P-I kinetic analysis of the whole system resulted in $DegT_{50}$ values of 7.22 days (SFO) for the test system. The DT_{50} for dissipation of pyraclostrobin from the water phase (P-I level) was determined to be 4.47 days (SFO) and from the sediment phase 5.93 days (SFO).

The level P-II kinetic analysis resulted in $DegT_{50}$ values 7.5 and 6.48 days for the water and sediment compartments respectively.

The endpoints for FOCUS surface water modeling according to the selection scheme given in the FOCUS Kinetics Guidance are as follows:

FOCUS surface water Step (irradiated; **BAS 500F**)		Justification
Step 1	7.22 d	System $DegT_{50}$, Level P-I
Step 2	7.5 d for water and 6.48 d for sediment	Water and sediment $DegT_{50}$, Level P-II
Step 3	7.5 d for water and 6.48 d for sediment	Water and sediment $DegT_{50}$, Level P-II

At the M-I level dissipation kinetics were evaluated for the metabolites BF 500-11 and BF 500-14 in the water compartment and for BF 500-3 in the sediment compartment. Degradation kinetics in the complete system were evaluated for all three metabolites. The metabolite BF 500-13 could not be evaluated on the basis of the experimental data. In all cases the SFO kinetic model was applied.

The endpoints for FOCUS surface water modeling according to the selection scheme given in the FOCUS Kinetics Guidance are as follows:

FOCUS surface water Step (irradiated; **BF 500-3**)		Justification
Step 1	92.54 d	Level M-I system decline (metabolite dissipation) DT_{50}
Step 2	92.54 d for water and sediment	Level M-I system decline (metabolite dissipation) DT_{50}
Step 3	1000 d for sediment 1000 d for water	No reliable degradation rate could be determined for the system. Default value of 1000 for sediment Default value of 1000 for water

FOCUS surface water Step (irradiated; **BF 500-11**)		Justification
Step 1	22.62 d	Level M-I system decline (metabolite dissipation) DT_{50}
Step 2	22.62 d for water and sediment	Level M-I system decline (metabolite dissipation) DT_{50}
Step 3	22.90 d for water 1000 d for sediment	Water considered to be main degrading compartment -> Level M-I system degradation $DegT_{50}$ Default value of 1000 for sediment.

FOCUS surface water Step (irradiated; **BF 500-13**)		Justification
Step 1	1000 d	No dissipation/degradation rates could be determined from the data. Default value of 1000.
Step 2	1000 d for water and sediment	No dissipation/degradation rates could be determined from the data. Default value of 1000.
Step 3	1000 d for water 1000 d for sediment	No dissipation/degradation rates could be determined from the data. Default value of 1000 for both compartments.

FOCUS surface water Step (irradiated; **BF 500-14**)		Justification
Step 1	17.29 d	Level M-I system decline (metabolite dissipation) DT_{50}
Step 2	17.29 d for water and sediment	Level M-I system decline (metabolite dissipation) DT_{50}
Step 3	8.21 d for water 1000 d for sediment	Water considered to be main degrading compartment -> Level M-I system degradation $DegT_{50}$. Default value of 1000 for sediment.

Appendix 3 Additional information provided by the applicant (e.g. detailed modelling data)

Field soil degradation of pyraclostrobin: assessment of Spanish field trial sites

The degradation behaviour of pyraclostrobin was investigated in two different field dissipation studies with altogether six trials located in Germany (n=3), Spain (n=2) and Sweden (n=1). For details, please refer to chapter 8.4.1 in Section 8.

Following the recommendations of the FOCUS work group on degradation kinetics [*FOCUS (2005) "Guidance Document on Estimating Persistence and Degradation Kinetics from Environmental Fate Studies on Pesticides in EU Registration" Report of the FOCUS Work Group on Degradation Kinetics, EC Document Reference Sanco/10058/2005 version 1.0*], normalization of the degradation rate constant of pyraclostrobin in the field to a reference temperature of 20°C and a reference soil moisture at pF2 was conducted (BASF DocID 2006/1007384; summary provided above). For four of the six field trials (three in Germany and one in Sweden), degradation rates for pyraclostrobin could be estimated according to first-order kinetics following guidance of the FOCUS kinetics group.

The evaluation of data from the two Spanish trials (ALO/01/98, ALO/02/98) concluded that the two trials could not be used for normalization. On the one hand, degradation at the two sites was bi-phasic and such kinetics was not used at the time the normalization procedure was performed (2006); single-first order kinetics was preferred. On the other hand, during re-evaluation of the kinetics for the active substance renewal (AIR) of pyraclostrobin (submitted in 2014), the two Spanish trial sites were shown to be not representative for European conditions (a crucial evaluation criterion of the CTGB criteria). At these two sites, pyraclostrobin was applied quite late in the year (7th May for Manzanilla, 26th May for Alcala del Rio) so that a long dry period (>3 months) followed leading to very low soil moisture contents (measured as well as confirmed with PEARL 4.4.4 simulations). The low soil moisture reduced microbial activity and thus microbial degradation in soil. Such dry climatic conditions are not typical for the use of fungicides such as pyraclostrobin. Additionally, the two Spanish trial sites were not irrigated allowing the low soil moisture conditions to prevail for an extended period of time. In normal agricultural practice, it would be highly likely that a farmer would irrigate the field during such extended dry periods. The two Spanish sites were therefore considered to not be representative for European agronomic conditions and were deemed not appropriate for derivation of modelling endpoints.

Appendix 4 Detailed evaluation of the new Annex II studies

Present the authority's comment on the study in a box above each individual study. If there is more than one fate study available, list each one separately, i.e., A.7.1.1 Study 1, A.7.1.2 Study 2 etc.

Appendix 5 Additional information provided by the applicant (e.g. detailed modelling data)

Detailed Modelling results and files for PEC_{SW}

Detailed STEP 3 Results – Mefentrifluconazole

Table A 25: Detailed STEP 3 output after single and multiple application of Mefentrifluconazole to spring cereals – 67 g a.s./ha

Scenario	Waterbody	PEC_{SW} max. [µg/L]	PEC_{SW} twa21 [µg/L]	Main entry path	PEC_{SED} max. [µg/kg]
Single – 1x67 g a.s./ha					
D1	Ditch	0.760	0.535	Spray drift	9.832
D1	Stream	0.349	0.286	Drainage	5.198
D3	Ditch	0.371	0.041	Spray drift	0.345
D4	Pond	0.038	0.031	Drainage	0.351
D4	Stream	0.309	0.013	Spray drift	0.126
D5	Pond	0.021	0.018	Spray drift	0.205
D5	Stream	0.320	0.002	Spray drift	0.024
R4	Stream	0.495	0.061	Runoff	2.073
Multiple – 2x67 g a.s./ha					
D1	Ditch	0.578	0.382	Spray drift	5.380
D1	Stream	0.378	0.158	Spray drift	2.833
D3	Ditch	0.424	0.023	Spray drift	0.286
D4	Pond	0.020	0.016	Drainage	0.194
D4	Stream	0.346	0.007	Spray drift	0.065
D5	Pond	0.015	0.013	Spray drift	0.122
D5	Stream	0.356	0.001	Spray drift	0.016
R4	Stream	0.280	0.041	Spray drift	1.016

Table A 26: Detailed STEP 3 output after single and multiple application of Mefentrifluconazole to spring cereals – 100 g a.s./ha

Scenario	Waterbody	PEC_{SW} max. [µg/L]	PEC_{SW} twa21 [µg/L]	Main entry path	PEC_{SED} max. [µg/kg]
Single – 1x100 g a.s./ha					
D1	Ditch	1.139	0.802	Spray drift	14.820
D1	Stream	0.529	0.434	Drainage	7.841
D3	Ditch	0.553	0.061	Spray drift	0.514
D4	Pond	0.057	0.048	Drainage	0.529
D4	Stream	0.461	0.020	Spray drift	0.191
D5	Pond	0.032	0.028	Spray drift	0.309
D5	Stream	0.477	0.002	Spray drift	0.036
R4	Stream	0.742	0.091	Runoff	3.057
Multiple – 2x100 g a.s./ha					
D1	Ditch	0.866	0.574	Spray drift	8.096
D1	Stream	0.564	0.240	Spray drift	4.266
D3	Ditch	0.632	0.035	Spray drift	0.427
D4	Pond	0.030	0.025	Drainage	0.292
D4	Stream	0.517	0.010	Spray drift	0.098
D5	Pond	0.023	0.019	Spray drift	0.182
D5	Stream	0.531	0.001	Spray drift	0.024
R4	Stream	0.418	0.061	Spray drift	1.510

Table A 27: Detailed STEP 3 output after single and multiple application of Mefentrifluconazole to winter cereals – 67 g a.s./ha

Scenario	Waterbody	PEC_{SW} max. [µg/L]	PEC_{SW} twa21 [µg/L]	Main entry path	PEC_{SED} max. [µg/kg]
Single - 1x 67 g a.s./ha					
D1	Ditch	0.640	0.257	Spray drift	4.474
D1	Stream	0.463	0.157	Spray drift	2.487
D2	Ditch	0.541	0.224	Spray drift	4.107
D2	Stream	0.424	0.126	Spray drift	2.267
D3	Ditch	0.423	0.021	Spray drift	0.261
D4	Pond	0.019	0.016	Drainage	0.180
D4	Stream	0.313	0.007	Spray drift	0.065
D5	Pond	0.016	0.013	Spray drift	0.123
D5	Stream	0.338	0.001	Spray drift	0.011
D6	Ditch	0.429	0.137	Drainage	0.980
R1	Pond	0.033	0.031	Runoff	0.468
R1	Stream	0.279	0.013	Spray drift	0.501
R3	Stream	0.392	0.014	Spray drift	0.622
R4	Stream	0.280	0.024	Spray drift	0.682
Multiple - 2x 67 g a.s./ha					
D1	Ditch	0.816	0.527	Spray drift	9.069
D1	Stream	0.559	0.319	Spray drift	4.983
D2	Ditch	0.902	0.444	Drainage	8.222
D2	Stream	0.563	0.253	Drainage	4.544
D3	Ditch	0.371	0.038	Spray drift	0.327
D4	Pond	0.039	0.032	Drainage	0.347
D4	Stream	0.280	0.014	Spray drift	0.132
D5	Pond	0.023	0.020	Spray drift	0.211
D5	Stream	0.323	0.002	Spray drift	0.028
D6	Ditch	0.767	0.134	Drainage	0.863
R1	Pond	0.079	0.073	Runoff	1.082
R1	Stream	0.393	0.032	Runoff	1.408
R3	Stream	0.375	0.028	Runoff	1.292
R4	Stream	0.551	0.049	Runoff	1.513

Table A 28: Detailed STEP 3 output after single and multiple application of Mefentrifluconazole to winter cereals – 100 g a.s./ha

Scenario	Waterbody	PEC_{SW} max. [µg/L]	PEC_{SW} twa21 [µg/L]	Main entry path	PEC_{SED} max. [µg/kg]
Single - 1x 100 g a.s./ha					
D1	Ditch	0.963	6.744	Spray drift	0.391
D1	Stream	0.695	3.747	Spray drift	0.238
D2	Ditch	0.812	6.189	Spray drift	0.340
D2	Stream	0.636	3.420	Spray drift	0.191
D3	Ditch	0.632	0.390	Spray drift	0.031
D4	Pond	0.029	0.271	Drainage	0.024
D4	Stream	0.467	0.098	Spray drift	0.010
D5	Pond	0.023	0.184	Spray drift	0.019
D5	Stream	0.504	0.016	Spray drift	0.001
D6	Ditch	0.650	1.458	Drainage	0.205
R1	Pond	0.050	0.696	Runoff	0.046
R1	Stream	0.416	0.742	Spray drift	0.020
R3	Stream	0.585	0.926	Spray drift	0.021
R4	Stream	0.418	1.009	Spray drift	0.035
Multiple - 2x 100 g a.s./ha					
D1	Ditch	1.233	13.650	Spray drift	0.799
D1	Stream	0.844	7.501	Spray drift	0.482
D2	Ditch	1.356	12.390	Drainage	0.671
D2	Stream	0.847	6.857	Drainage	0.384
D3	Ditch	0.553	0.486	Spray drift	0.056
D4	Pond	0.059	0.522	Drainage	0.049
D4	Stream	0.417	0.200	Spray drift	0.021
D5	Pond	0.034	0.319	Spray drift	0.030
D5	Stream	0.482	0.041	Spray drift	0.003
D6	Ditch	1.161	1.285	Drainage	0.201
R1	Pond	0.118	1.612	Runoff	0.109
R1	Stream	0.589	2.087	Runoff	0.048
R3	Stream	0.562	1.923	Runoff	0.042
R4	Stream	0.827	2.240	Runoff	0.072

Table A 29: Detailed STEP 3 output after single and multiple application of Mefentrifluconazole to spring oil seed rape

Scenario	Waterbody	PEC_{SW} max. [µg/L]	PEC_{SW} twa21 [µg/L]	Main entry path	PEC_{SED} max. [µg/kg]
Single – 1x67 g a.s./Ha					
R1	Pond	0.058	0.984	Runoff	0.052
R1	Stream	0.278	0.830	Spray drift	0.020
Multiple – 2x67 g a.s./ha					
R1	Pond	0.109	1.776	Runoff	0.098
R1	Stream	0.387	1.527	Runoff	0.035
Single – 1x100 g a.s./Ha					
R1	Pond	0.086	1.463	Runoff	0.078
R1	Stream	0.415	1.230	Spray drift	0.029
Multiple – 2x100 g a.s./ha					
R1	Pond	0.162	2.643	Runoff	0.147
R1	Stream	0.581	2.269	Runoff	0.052

Detailed STEP 3 Results – Metrafenone

Table A 30 Detailed STEP 3 output after single and multiple application of pyraclostrobin to spring cereals – 100 g a.s./ha

Scenario	Waterbody	PEC_{SW} max. [µg/L]	PEC_{SW} twa21 [µg/L]	Main entry path	PEC_{SED} max. [µg/kg]
Single – 1x100 g a.s./ha					
D3	Ditch	0.632	Spray drift	0.034	0.424
D4	Pond	0.030	Drainage	0.023	0.173
D4	Stream	0.516	Spray drift	0.011	0.122
D5	Pond	0.022	Spray drift	0.017	0.113
D5	Stream	0.530	Spray drift	0.001	0.023
R4	Stream	0.417	Spray drift	0.052	1.464
Multiple – 2x100 g a.s./ha					
D3	Ditch	0.553	Spray drift	0.059	0.466
D4	Pond	0.062	Drainage	0.048	0.351
D4	Stream	0.461	Spray drift	0.023	0.251
D5	Pond	0.028	Spray drift	0.022	0.151
D5	Stream	0.476	Spray drift	0.002	0.033
R4	Stream	0.663	Spray drift	0.077	1.660

Table A 31 **Detailed STEP 3 output after single and multiple application of metrafenone to winter cereals – 100 g a.s./ha**

Scenario	Waterbody	PEC_{SW} max. [µg/L]	PEC_{SW} twa21 [µg/L]	Main entry path	PEC_{SED} max. [µg/kg]
Single – 1x100 g a.s./ha					
D3	Ditch	0.631	Spray drift	0.030	0.399
D4	Pond	0.030	Drainage	0.023	0.170
D4	Stream	0.466	Spray drift	0.011	0.124
D5	Pond	0.022	Spray drift	0.017	0.118
D5	Stream	0.504	Spray drift	0.001	0.015
R1	Pond	0.034	Runoff	0.026	0.195
R1	Stream	0.416	Spray drift	0.016	0.557
R3	Stream	0.584	Spray drift	0.016	0.815
R4	Stream	0.417	Spray drift	0.024	0.635
Multiple – 2x100 g a.s./ha					
D3	Ditch	0.552	Spray drift	0.055	0.463
D4	Pond	0.068	Drainage	0.053	0.376
D4	Stream	0.417	Spray drift	0.025	0.274
D5	Pond	0.031	Spray drift	0.025	0.176
D5	Stream	0.481	Spray drift	0.003	0.040
R1	Pond	0.082	Runoff	0.063	0.448
R1	Stream	0.515	Runoff	0.042	1.526
R3	Stream	0.508	Spray drift	0.035	1.758
R4	Stream	0.732	Runoff	0.050	1.421

Table A 32 **Detailed STEP 3 output after single and multiple application of metrafenone to spring cereals – 150 g a.s./ha**

Scenario	Waterbody	PEC_{SW} max. [µg/L]	PEC_{SW} twa21 [µg/L]	Main entry path	PEC_{SED} max. [µg/kg]
Single – 1x150 g a.s./ha					
D3	Ditch	0.948	Spray drift	0.051	0.634
D4	Pond	0.048	Drainage	0.038	0.275
D4	Stream	0.775	Spray drift	0.018	0.195
D5	Pond	0.034	Spray drift	0.026	0.168
D5	Stream	0.796	Spray drift	0.002	0.034
R4	Stream	0.626	Spray drift	0.080	2.153
Multiple – 2x150 g a.s./ha					
D3	Ditch	0.829	Spray drift	0.089	0.694
D4	Pond	0.100	Drainage	0.078	0.559
D4	Stream	0.691	Spray drift	0.038	0.400
D5	Pond	0.043	Spray drift	0.033	0.225
D5	Stream	0.715	Spray drift	0.003	0.050
R4	Stream	1.020	Runoff	0.117	2.457

Table A 33 **Detailed STEP 3 output after single and multiple application of metrafenone to winter cereals – 150 g a.s./ha**

Scenario	Waterbody	PEC_{SW} max. [µg/L]	PEC_{SW} twa21 [µg/L]	Main entry path	PEC_{SED} max. [µg/kg]
Single – 1x150 g a.s./ha					
D3	Ditch	0.947	Spray drift	0.046	0.597
D4	Pond	0.049	Drainage	0.038	0.272
D4	Stream	0.700	Spray drift	0.018	0.198
D5	Pond	0.034	Spray drift	0.026	0.176
D5	Stream	0.756	Spray drift	0.002	0.022
R1	Pond	0.052	Runoff	0.040	0.293
R1	Stream	0.624	Spray drift	0.025	0.816
R3	Stream	0.876	Spray drift	0.025	1.203
R4	Stream	0.626	Spray drift	0.037	0.923
Multiple – 2x150 g a.s./ha					
D3	Ditch	0.829	Spray drift	0.083	0.690
D4	Pond	0.109	Drainage	0.085	0.599
D4	Stream	0.625	Spray drift	0.041	0.438
D5	Pond	0.047	Spray drift	0.038	0.263
D5	Stream	0.722	Spray drift	0.004	0.060
R1	Pond	0.126	Runoff	0.097	0.674
R1	Stream	0.792	Runoff	0.064	2.240
R3	Stream	0.762	Spray drift	0.053	2.606
R4	Stream	1.127	Runoff	0.075	2.072

Table A 34: **Detailed STEP 3 output after single and multiple application of metrafenone to spring oil seed rape**

Scenario	Waterbody	PEC_{SW} max. [µg/L]	Main entry path	PEC_{SW} twa21 [µg/L]	PEC_{SED} max. [µg/kg]
Single – 1x100 g a.s./ha					
R1	Pond	0.049	Runoff	0.042	0.460
R1	Stream	0.415	Spray drift	0.025	0.949
Multiple – 2x100 g a.s./ha					
R1	Pond	0.093	Runoff	0.080	0.861
R1	Stream	0.500	Runoff	0.041	1.493
Single – 1x150 g a.s./Ha					
R1	Pond	0.073	Runoff	0.063	0.685
R1	Stream	0.622	Spray drift	0.039	1.394
Multiple – 2x150 g a.s./ha					
R1	Pond	0.140	Runoff	0.121	1.283
R1	Stream	0.768	Runoff	0.062	2.187

Detailed STEP 3 Results – Pyraclostrobin

Table A 35 Detailed STEP 3 output after single and multiple application of pyraclostrobin to spring cereals – 80 g a.s./ha

Scenario	Waterbody	PEC_{SW} max. [µg/L]	PEC_{SW} twa21 [µg/L]	Main entry path	PEC_{SED} max. [µg/kg]
Single – 1x80 g a.s./ha					
D1	Ditch	0.508	0.254	Spray drift	2.104
D1	Stream	0.444	0.019	Spray drift	0.279
D3	Ditch	0.502	0.027	Spray drift	0.381
D4	Pond	0.017	0.013	Spray drift	0.135
D4	Stream	0.434	0.006	Spray drift	0.094
D5	Pond	0.017	0.013	Spray drift	0.145
D5	Stream	0.464	0.006	Spray drift	0.100
R4	Stream	0.332	0.027	Spray drift	3.024
Multiple – 2x80 g a.s./ha					
D1	Ditch	0.600	0.327	Spray drift	3.398
D1	Stream	0.384	0.032	Spray drift	0.358
D3	Ditch	0.440	0.048	Spray drift	0.507
D4	Pond	0.023	0.018	Spray drift	0.208
D4	Stream	0.367	0.004	Spray drift	0.054
D5	Pond	0.021	0.017	Spray drift	0.203
D5	Stream	0.344	0.001	Spray drift	0.012
R4	Stream	0.295	0.036	Runoff	3.346

Table A 36 Detailed STEP 3 output after single and multiple application of pyraclostrobin to spring cereals – 120 g a.s./ha

Scenario	Waterbody	PEC_{SW} max. [µg/L]	PEC_{SW} twa21 [µg/L]	Main entry path	PEC_{SED} max. [µg/kg]
Single - 1x120 g a.s./ha					
D1	Ditch	0.762	0.382	Spray drift	3.145
D1	Stream	0.667	0.028	Spray drift	0.418
D3	Ditch	0.754	0.041	Spray drift	0.570
D4	Pond	0.026	0.020	Spray drift	0.199
D4	Stream	0.616	0.003	Spray drift	0.043
D5	Pond	0.026	0.020	Spray drift	0.209
D5	Stream	0.633	0.002	Spray drift	0.027
R4	Stream	0.498	0.041	Spray drift	4.501
Multiple - 2x120 g a.s./ha					
D1	Ditch	0.901	0.492	Spray drift	5.079
D1	Stream	0.577	0.049	Spray drift	0.535
D3	Ditch	0.660	0.071	Spray drift	0.758
D4	Pond	0.035	0.028	Spray drift	0.311
D4	Stream	0.550	0.006	Spray drift	0.081
D5	Pond	0.032	0.024	Spray drift	0.293
D5	Stream	0.608	0.011	Spray drift	0.173
R4	Stream	0.451	0.056	Runoff	4.928

Table A 37 Detailed STEP 3 output after single and multiple application of pyraclostrobin to winter cereals – 80 g a.s./ha

Scenario	Waterbody	PEC_{SW} max. [µg/L]	PEC_{SW} twa21 [µg/L]	Main entry path	PEC_{SED} max. [µg/kg]
Single – 1x80 g a.s./ha					
D1	Ditch	0.504	0.042	Spray drift	0.553
D1	Stream	0.392	0.001	Spray drift	0.017
D2	Ditch	0.507	0.053	Spray drift	0.749
D2	Stream	0.430	0.005	Spray drift	0.074
D3	Ditch	0.502	0.024	Spray drift	0.348
D4	Pond	0.017	0.013	Spray drift	0.149
D4	Stream	0.371	0.001	Spray drift	0.011
D5	Pond	0.017	0.013	Spray drift	0.142
D5	Stream	0.401	0.001	Spray drift	0.012
D6	Ditch	0.506	0.133	Spray drift	1.496
R1	Pond	0.017	0.013	Spray drift	0.235
R1	Stream	0.331	0.006	Spray drift	1.208
R3	Stream	0.464	0.006	Spray drift	1.231
R4	Stream	0.332	0.008	Spray drift	1.789
Multiple – 2x80 g a.s./ha					
D1	Ditch	0.445	0.156	Spray drift	1.818
D1	Stream	0.374	0.005	Spray drift	0.078
D2	Ditch	0.448	0.115	Spray drift	1.620
D2	Stream	0.388	0.092	Spray drift	1.219
D3	Ditch	0.440	0.044	Spray drift	0.487
D4	Pond	0.021	0.016	Spray drift	0.228
D4	Stream	0.331	0.001	Spray drift	0.016
D5	Pond	0.024	0.019	Spray drift	0.228
D5	Stream	0.383	0.002	Spray drift	0.034
D6	Ditch	0.442	0.117	Spray drift	1.309
R1	Pond	0.032	0.026	Runoff	0.472
R1	Stream	0.286	0.015	Spray drift	3.010
R3	Stream	0.404	0.015	Spray drift	2.525
R4	Stream	0.299	0.018	Runoff	4.006

Table A 38 Detailed STEP 3 output after single and multiple application of pyraclostrobin to winter cereals – 120 g a.s./ha

Scenario	Waterbody	PEC_{SW} max. [µg/L]	PEC_{SW} twa21 [µg/L]	Main entry path	PEC_{SED} max. [µg/kg]
Multiple – 2x80 g a.s./ha					
D1	Ditch	0.756	0.063	Spray drift	0.828
D1	Stream	0.588	0.002	Spray drift	0.025
D2	Ditch	0.760	0.079	Spray drift	1.123
D2	Stream	0.646	0.007	Spray drift	0.111
D3	Ditch	0.753	0.036	Spray drift	0.521
D4	Pond	0.026	0.019	Spray drift	0.222
D4	Stream	0.556	0.001	Spray drift	0.016
D5	Pond	0.026	0.020	Spray drift	0.212
D5	Stream	0.601	0.001	Spray drift	0.017
D6	Ditch	0.760	0.200	Spray drift	2.237
R1	Pond	0.026	0.020	Spray drift	0.352
R1	Stream	0.496	0.009	Spray drift	1.794
R3	Stream	0.697	0.009	Spray drift	1.841
R4	Stream	0.498	0.012	Spray drift	2.649
Multiple – 2x80 g a.s./ha					
D1	Ditch	0.668	0.234	Spray drift	2.715
D1	Stream	0.561	0.007	Spray drift	0.116
D2	Ditch	0.673	0.173	Spray drift	2.421
D2	Stream	0.583	0.138	Spray drift	1.824
D3	Ditch	0.659	0.066	Spray drift	0.728
D4	Pond	0.031	0.025	Spray drift	0.340
D4	Stream	0.497	0.001	Spray drift	0.023
D5	Pond	0.036	0.028	Spray drift	0.340
D5	Stream	0.574	0.004	Spray drift	0.051
D6	Ditch	0.664	0.175	Spray drift	1.957
R1	Pond	0.048	0.040	Runoff	0.710
R1	Stream	0.429	0.023	Spray drift	4.473
R3	Stream	0.606	0.023	Spray drift	3.777
R4	Stream	0.458	0.028	Runoff	5.934

Table A 39 Detailed STEP 3 output after single and multiple application of pyraclostrobin to spring oil seed rape

Scenario	Waterbody	PEC_{SW} max. [µg/L]	PEC_{SW} twa21 [µg/L]	Main entry path	PEC_{SED} max. [µg/kg]
Single – 1x80 g a.s./ha					
R1	Pond	0.018	0.015	Runoff	0.257
R1	Stream	0.330	0.009	Spray drift	1.545
Multiple – 2x80 g a.s./ha					
R1	Pond	0.030	0.023	Spray drift	0.394
R1	Stream	0.285	0.009	Spray drift	2.709
Single – 1x120 g a.s./ha					
R1	Pond	0.027	0.023	Runoff	0.385
R1	Stream	0.495	0.013	Spray drift	2.296
Multiple – 2x120 g a.s./ha					
R1	Pond	0.047	0.038	Runoff	0.624
R1	Stream	0.428	0.014	Spray drift	4.213