

FINAL REGISTRATION REPORT

Part B

Section 8

Environmental Fate

Detailed summary of the risk assessment

Product code: SHA 7273 A

Product name(s): CASINO ROYALE

Chemical active substance(s):

Boscalid, 267g/kg

Pyraclostrobin, 67 g/kg

Central Zone

Zonal Rapporteur Member State: Poland

CORE ASSESSMENT

Applicant: Sharda Cropchem España S.L.

Submission date: August 2020

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Version history

When	What
August 2020	Submission dRR by Applicant
July 2021	Draft assessment by zRMS
January 2022	Final Registration Report

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All comments and conclusions of the zRMS are presented in grey commenting boxes. Minor changes are introduced directly in the text and highlighted in grey. Not agreed or not relevant information is struck through and shaded for transparency.

8.1 Critical GAP and overall conclusions

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: e.g. g safener/ synergist per ha	Conclusion
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/season	Min. interval between applications (days)	kg or L product/ha a) max. rate per appl. b) max. total rate per crop/season	g or kg as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min/max			Groundwater
Zonal uses (field or outdoor uses, certain types of protected crops)														

1	CEU	Sugarbeet	F	Cercospora beticola	Foliar Spray	BBCH 31-39	a) 2 b) 2	8-10	a) 1.5 b) 3.0	a) 0.4 bos-calid + 0.1 pyraclostrobin b) 0.8 bos-calid + 0.2 pyraclostrobin	300-600	-		
2	CEU	Tomato	F	Phytophthora infestans,	Foliar Spray	When first symptoms are visible BBCH 20-87	a) 2 b) 2	8-10	a) 1.5 b) 3.0	a) 0.4 bos-calid + 0.1 pyraclostrobin b) 0.8 bos-calid + 0.2 pyraclostrobin	300-600	-		
3	CEU	Tomato	F	Alternaria sp.	Foliar Spray	When first symptoms are visible BBCH 20-87	a) 3 b) 3	8-10	a) 1.5 b) 4.5	a) 0.4 bos-calid + 0.1 pyraclostrobin b) 1.2 bos-calid + 0.3 pyraclostrobin	300-600			
4	CEU	Carrot	F	Septoria apiicola, Cercospora sp, Alternaria sp.	Foliar Spray	When first symptoms are visible BBCH 41-49	a) 2 b) 2	8-10	a) 1.5 b) 3.0	a) 0.4 bos-calid + 0.1 pyraclostrobin b) 0.8 bos-calid + 0.2 pyraclostrobin	300-600			
5	CEU	Onion	F	Puccinia allii	Foliar Spray	When first symptoms are visible BBCH 41-49	a) 2 b) 2	14	a) 1.5 b) 3.0	a) 0.4 bos-calid + 0.1 pyraclostrobin b) 0.8 bos-calid + 0.2 pyraclostrobin	300-600			
Unprotected uses in SIGNUM														

6	PL	Cabbage	F	<i>Alternaria</i> , <i>Botrytis cinerea</i>	Spray	BBCH 41-49	a) 1-3 b) 1-3	7	a) 1.0 b) 3.0	a) 0.267 boscalid + 0.067 pyraclostrobin b) 0.8 boscalid + 0.2 pyraclostrobin	600-800	14	Unprotected use in SIGNUM	
7	PL	Tomatoe in green-houses	G	<i>Botrytis cinerea</i> , <i>Phytophthora infestans</i>	Spray	BBCH 51-85	a) 1-2 b) 1-2	7	a) 2.0 b) 4.0	a) 0.534 boscalid + 0.134 pyraclostrobin b) 1.068 + 0.268 pyraclostrobin	1000	3	Unprotected use in SIGNUM	
8	PL	Strawberry	F	<i>Botrytis cinerea</i> , <i>Ramularia grevilleana</i> , <i>Spaerotheca macularis</i> ,	Spray	BBCH 60-81	a) 1-2 b) 1-2	5	a) 1.8 b) 3.6	a) 0.481 boscalid + 0.121 pyraclostrobin b) 0.961 boscalid + 0.241 pyraclostrobin	500-700	3	Unprotected use in SIGNUM	
9	PL	Cherry	F	<i>Monilinia sp.</i>	Spray	BBCH 60-67	a) 1-2 b) 1-2	5	a) 1.0 b) 2.0	a) 0.267 boscalid + 0.067 pyraclostrobin b) 0.534 boscalid + 0.134 pyraclostrobin	500-750	7	Unprotected use in SIGNUM	
10	PL	Raspberry	F	<i>Botrytis cinerea</i> , <i>Didymella applanate</i>	Spray	BBCH 51-90	a) 1-2 b) 1-2	7	a) 1.8 b) 3.6	a) 0.481 boscalid + 0.121 pyraclostrobin b) 0.961 boscalid + 0.241 pyraclostrobin	600-700	3	Unprotected use in SIGNUM	
11	PL	Blackcurrant	F	<i>Drepanopeziza ribis</i> <i>Cronartium ribicola</i>	Spray	BBCH 55-90	a) 1-2 b) 1-2	7-10	a) 1.8 b) 3.6	a) 0.481 boscalid + 0.121 pyraclostrobin b) 0.961 boscalid + 0.241 pyraclostrobin	600-800	3	Unprotected use in SIGNUM	

										clostrob				
Minor uses according to Article 51 (zonal uses)														
12	PL	Beetroot	F	<i>Erysiphe betae</i>	Spray	BBCH 15-49	a) 1-2 b) 1-2	10-14	a) 1.0 b) 2.0	a) 0.267 boscalid + 0.067 pyraclostrobin b) 0.534 boscalid + 0.134 pyraclostrobin	300-600	14		
13	PL	Celery root	F	<i>Sclerotinia sclerotiorum</i>	Spray	BBCH 15-49	a) 1-2 b) 1-2	10-14	a) 1.5 b) 3.0	a) 0.4 boscalid + 0.1 pyraclostrobin b) 0.8 boscalid + 0.2 pyraclostrobin	300-600	14		
14	PL	Parsnip, Parsley	F	<i>Alternaria sp. alternata</i> , <i>Erysiphe heraclei</i>	Spray	BBCH 15-49	a) 1-2 b) 1-2	21-28	a) 0.75 b) 1.5	a) 0.200 boscalid + 0.050 pyraclostrobin b) 0.400 boscalid + 0.100 pyraclostrobin	600-	14		
15	PL	Radish	F	<i>Botrytis cinerea</i> ,	Spray	BBCH 11-49	a) 1-2 b) 1-2	14-21	a) 1.5 b) 3.0	a) 0.4 boscalid + 0.1 pyraclostrobin b) 0.8 boscalid + 0.2 pyraclostrobin	300-	14		
16	PL	Radish	F	<i>Rhizoctonia solani</i>	Spray	BBCH 11-12	a) 1 b) 1	NR	a) 1.5 b) 1.5	a) 0.4 boscalid + 0.1 pyraclostrobin b) 0.4 boscalid + 0.1 pyraclostrobin	300-600	14		
17	PL	Horseradish	F	<i>Peronospora sp.</i> <i>Alternaria</i> <i>Erysiphe sp.</i>		BBCH 15-49	a) 1-2 b) 1-2	14-21	a) 1.5 b) 3.0	a) 0.4 boscalid + 0.1 pyraclostrobin b) 0.8 boscalid + 0.2 pyraclostrobin	300-600	14		

18	PL	Swedes/rutabagas	F	<i>Peronospora sp.</i> <i>Cercospora beticola</i> <i>Erysiphe sp.</i>	Spray	BBCH 15-49	a) 1-2 b) 1-2	10-14	a) 1.0 b) 2.0	a) 0.267 boscalid + 0.067 pyraclostrobin b) 0.534 boscalid + 0.134 pyraclostrobin	300-600	14		
19	PL	Turnip	F	<i>Botrytis cinerea</i> , <i>Thanatephorus cucumeris</i>	Spray	BBCH 11-49	a) 1-2 b) 1-2	14-21	a) 1.5 b) 3.0	a) 0.4 boscalid + 0.1 pyraclostrobin b) 0.8 boscalid + 0.2 pyraclostrobin	300-600	14		
20	PL	Chicory roots	F	<i>Chicory Alternaria</i> , <i>Chicory Puccinia</i>	Spray	BBCH 13-47	a) 1-2 b) 1-2	14-21	a) 1.5 b) 3.0	a) 0.4 boscalid + 0.1 pyraclostrobin b) 0.8 boscalid + 0.2 pyraclostrobin	300-600	14		
21	PL	Shallot	F	<i>Peronospora destructor</i> <i>Alternaria</i> , <i>Stemphylium</i>	Spray	BBCH 13-48	a) 1-2 b) 1-2	14	a) 1.0 b) 3.0	a) 0.267 boscalid + 0.067 pyraclostrobin b) 0.8 boscalid + 0.2 pyraclostrobin	300-600	14		
22	PL	Onion “seven years old”	F	<i>Puccinia porri</i> <i>Phytophthora porri</i> <i>Alternaria</i> ,	Spray	BBCH 13-47	a) 1-2 b) 1-2	21-28	a) 1.5 b) 3.0	a) 0.4 boscalid + 0.1 pyraclostrobin b) 0.8 boscalid + 0.2 pyraclostrobin	300-600	14		
23	PL	Aubergines/eggplants	G	<i>Botrytis cinerea</i> , <i>Sclerotinia sclerotiorum</i> <i>Leveillula taurica</i>	Spray	BBCH 12-89	a) 1-2 b) 1-2	7-10	a) 1.5 b) 3.0	a) 0.4 boscalid + 0.1 pyraclostrobin b) 0.8 boscalid + 0.2 pyraclostrobin	1000	14		
24	PL	aubergines/eggplants	F	<i>Phytophthora infestans</i> ,	Foliar Spray	When first symptoms are visible BBCH 20-87	a) 1-2 b) 1-2	8-10	a) 1.5 b) 3.0	a) 0.4 boscalid + 0.1 pyraclostrobin b) 0.8 boscalid + 0.2	300-600	3		

										pyraclostrobin				
25	PL	aubergines/eggplants	F	<i>Alternaria sp.</i>	Foliar Spray	When first symptoms are visible BBCH 20-87	a) 1-3 b) 1-3	8-10	a) 1.5 b) 4.5	a) 0.4 boscalid + 0.1 pyraclostrobin b) 1.2 boscalid + 0.3 pyraclostrobin	300-600	3		
26	PL	Ornamentals in field and greenhouses	F/G	<i>Alternaria</i>	Spray	BBCH 13-47	a) 1-2 b) 1-2	7-14	a) 0.1 b) 0.2	a) 0.0267 boscalid + 0.0067 pyraclostrobin b) 0.0534 boscalid + 0.00134 pyraclostrobin	100	-		
27	PL	Ornamentals in field and greenhouses	F/G	<i>Erysiphales</i>	Spray	BBCH 13-47	a) 1-2 b) 1-2	7-14	a) 0.18 b) 0.36	a) 0.0481 boscalid + 0.0121 pyraclostrobin b) 0.0962 boscalid + 0.0242 pyraclostrobin	100	-		
28	PL	Ornamentals in field and greenhouses	F/G	<i>Botrytis cinerea</i> , <i>Sclerotinia sclerotiorum</i> <i>Thanatephorus cucumeris</i>	Spray	BBCH 13-47	a) 1-2 b) 1-2	7-14	a) 0.15 b) 0.3	a) 0.04 boscalid + 0.01 pyraclostrobin b) 0.08 boscalid + 0.02 pyraclostrobin	100	-		
29	PL	Redcurrant, White currant	F	<i>Drepanopeziza ribis</i> , <i>Drepanopeziza rubric</i> , <i>Botrytis cinerea</i> ,	Spray	BBCH 55-90	a) 1-2 b) 1-2	7-10	a) 1.8 b) 3.6	a) 0.4806 boscalid + 0.1206 pyraclostrobin b) 0.9612 boscalid + 0.2412 pyraclostrobin	600-800	3		
30	PL	Salsifies	F	<i>Botrytis cinerea</i> , <i>Sclerotinia sclerotiorum</i> <i>Rhizoctonia</i>	Foliar Spray	When first symptoms are visible BBCH 41-49	a) 1-2 b) 1-2	8-10	a) 1.5 b) 3.0	a) 0.4 boscalid + 0.1 pyraclostrobin b) 0.8 boscalid + 0.2	300-	14		

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

** 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

Explanation for column 15 “Conclusion”

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

Table 8.1-2: 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: develop- mental 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 or L product/ha a) max. rate per appl. b) max. total rate per crop/season	g or kg as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min/max		
1	France	Grapes	F	P+d mildew	Row, SP	09-85	3	12	-	0.1	1000	35	-
2	Italy	Grapes	F	P+d mildew	Row, SP	60-80	3	12	-	0.1	1000	35	-
3	Portugal	Grapes	F	P+d mildew	Row, SP	16-71	3	12	-	0.1	1000	35	-
4	Spain	Grapes	F	P+d mildew	Row, SP	65-81	3	12	-	0.1	1000	35	-

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

** 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 Boscalid 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: develop- mental 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 or L product/ha a) max. rate per appl. b) max. total rate per crop/season	g or kg as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min/max		
1	EU (NEU- SEU)	Grape	F	<i>Botrytis</i>	Spraying	68-81	1	-	-	0.6	1000-1600	28	-
2	EU	Oilseed rape	F	<i>Sclerotinia, Alternaria, Phoma</i>	Spraying	30, 63-65	2	4-6 weeks	-	0.25	200-400	-	-
3	EU (NEU- SEU)	Peas	F	<i>Botrytis, Sclerotinia</i>	Spraying	60-69	2	7-10	-	0.5	400	7	-
4	EU (NEU- SEU)	Beans	F	<i>Botrytis, Sclerotinia</i>	Spraying	60-69	2	7-10	-	0.5	300	7	-

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

** 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

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

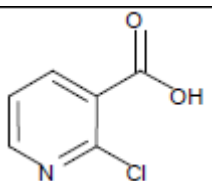
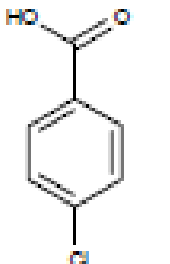
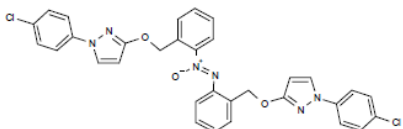
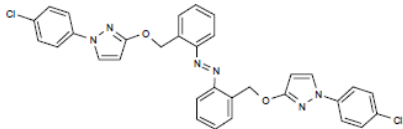
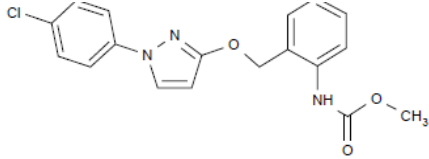
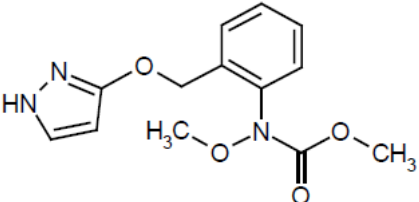
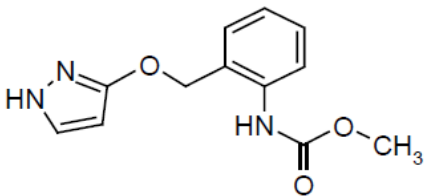
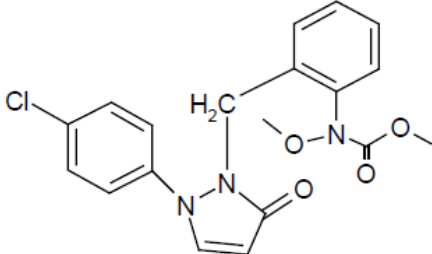
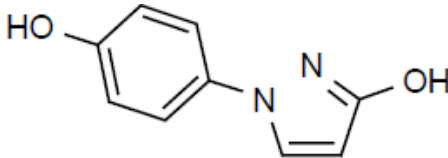
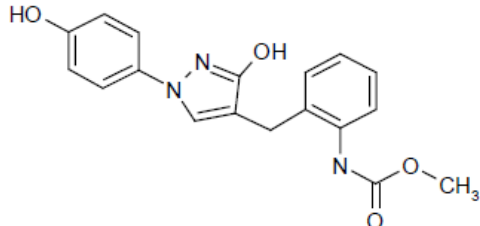
Metabolite	Molar mass	Chemical structure	Maximum observed occurrence in compartments	Exposure assessment required due to
M510F47	157.6		Soil: anaerobic conditions. 2.6 % after 3 d, 6 % after 62 d, 5.9 % after 90 d, 6.7 % after 120 d	-
M510F64	156.56		Sediment: under outdoor condit. 7.3 % after 7 d 9 % after 14 d 9.4 % after 30 d 1.9 % after 120 d	-

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

Metabolite	Molar mass	Chemical structure	Maximum observed occurrence in compartments	Exposure assessment required due to
BF 500-6	611.5		Soil: max. 31 % after 120 d Sediment : 6.5 % after 61 d	PEC _{soil} : if not covered by EU assessment PEC _{gw} : leaching potential to groundwater PEC _{sw/sed} : not covered by EU assessment
BF 500-7	595.5		Soil: max. 13 % after 62 d Sediment: 6.3% after 61 d	PEC _{soil} : if not covered by EU assessment PEC _{gw} : leaching potential to groundwater PEC _{sw/sed} : not covered by EU assessment
BF 500-3	357.8		Soil: max.95.8 % after 7 d (tolyl-label), anaerobic conditions Water: 2.3% after 61 d Sediment: 65.7 % after 14 d (river system)	PEC _{gw} : leaching potential to groundwater PEC _{sw/sed} : not covered by EU assessment
BF 500-11	277.3		Water/photolysis study: 44.5 % after 21 d (tolyl label)	PEC _{sw/sed} : not covered by EU assessment

Metabolite	Molar mass	Chemical structure	Maximum observed occurrence in compartments	Exposure assessment required due to
BF 500-13	247.3		Water/photolysis study: 16.8 % after 6 d (tolyl label)	PEC _{sw/sed} : not covered by EU assessment
BF 500-14	387.8		Water/photolysis study: 20.7 % after 3 h (Chlorophenyl label)	PEC _{sw/sed} : not covered by EU assessment
BF 500-15	176.2		Water/photolysis study: 26.6 % after 1 day (Chlorophenyl label)	PEC _{sw/sed} : not covered by EU assessment
500 M 58	-339.3		Water/photolysis study: 22.7 % after 6 h (chlorophenyl label)	PEC _{sw/sed} : not covered by EU assessment

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 substance.

8.3.1 Aerobic degradation in soil (KCP 9.1.1.1)

8.3.1.1 Boscalid and its metabolites

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

Boscalid, Laboratory studies, aerobic conditions										
Soil name	Soil type	pH (CaCl ₂)	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
Bruch West	Loamy sand	7.4	20	40	108	360	-	-	-	Y/Germany, 2002; Review Report, 2008
Li 35 b	Loamy sand	6.6	20	40	322	-	-	-	-	
Lufa 2.2	Loamy sand	5.6	20	40	384	-	-	-	-	
US soil	Sandy loam	7.0	20	40	376	-	-	-	-	
Minto (Canada)	Loam	7.7	20	40	133	442	-	-	-	
Median / geom. mean (n=5)							322 / 232			
pH-dependency: y/n							n			

8.3.1.2 Pyraclostrobin and its metabolites

Table 8.3-2: Summary of aerobic degradation rates for Pyraclostrobin - laboratory studies

Pyraclostrobin, Laboratory studies, aerobic conditions										
Soil name	Soil type	pH (CaCl ₂)	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
Bruch West	Loamy sand	7.3	20	40	12	143	-	-	-	Y/Germany, 2001; Review Report, 2004
Bruch West	Loamy sand	7.5	20	40	14	152	-	-	-	
Lufa 2.2	Loamy sand	5.4	20	40	101	-	-	-	-	

Pyraclostrobin, Laboratory studies, aerobic conditions										
Soil name	Soil type	pH (CaCl ₂)	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
Li35b	Loamy sand	6.5	20	40	50	163	-	-	-	
US 771-15	Loamy sand	5.6	20	40	38	-	-	-	-	
Canadian	Loam	7.7	20	40	85	-	-	-	-	
Maximum (n=6)							101			
pH-dependency: y/n							n			

Table 8.3-3: Summary of aerobic degradation rates for BF 500-6 - laboratory studies

BF 500-6, Laboratory studies, aerobic conditions										
Soil name	Soil type	pH (CaCl ₂)	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
Bruch West	Loamy sand	7.3	20	40	129	428	-	-	-	Y/Germany, 2001; Review Report, 2004
Bruch West	Loamy sand	7.5	20	40	166	552	-	-	-	
Lufa 2.2	Loamy sand	5.4	20	40	131	-	-	-	-	
Li35b	Loamy sand	6.5	20	40	-	-	-	-	-	
US 771-15	Loamy sand	5.6	20	40	70	231	-	-	-	
Canadian	Loam	7.7	20	40	-	-	-	-	-	
Maximum (n=4)							166			
pH-dependency: y/n							n			

Table 8.3-4: Summary of aerobic degradation rates for BF 500-7 - laboratory studies

BF 500-7, Laboratory studies, aerobic conditions										
Soil name	Soil type	pH (CaCl ₂)	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
Bruch West	Loamy sand	7.3	20	40	112	372	-	-	-	Y/Germany, 2001; Review Report, 2004
Bruch West	Loamy sand	7.5	20	40	159	529	-	-	-	
Lufa 2.2	Loamy	5.4	20	40	-	-	-	-	-	

BF 500-7, Laboratory studies, aerobic conditions										
Soil name	Soil type	pH (CaCl ₂)	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
	sand									
Li35b	Loamy sand	6.5	20	40	-	-	-	-	-	
US 771-15	Loamy sand	5.6	20	40	38	126	-	-	-	
Canadian	Loam	7.7	20	40	-	-	-	-	-	
Maximum (n=3)							159			
pH-dependency: y/n							n			

8.3.2 Anaerobic degradation in soil (KCP 9.1.1.1)

8.3.2.1 Boscalid and its metabolites

Table 8.3-5: Summary of anaerobic degradation rates for Boscalid - laboratory studies

Boscalid, Laboratory studies, anaerobic conditions										
Soil name	Soil type	pH (CaCl ₂)	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
Bruch West	Loamy sand	7.4	20	Flooded	261	-	-	-	-	Y/Germany, 2002; Review Report, 2008
Bruch West	Loamy sand	7.4	20	Flooded	345	-	-	-	-	
Geom. mean (n=2)							300			
pH-dependency: y/n							n			

8.3.2.2 Pyraclostrobin and its metabolites

Table 8.3-6: Summary of anaerobic degradation rates for Pyraclostrobin - laboratory studies

Pyraclostrobin, Laboratory studies, anaerobic conditions										
Soil name	Soil type	pH (CaCl ₂)	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
Bruch West	Loamy sand	7.3	20	Flooded	2	5	-	-	-	Y/Germany, 2001;

Pyraclostrobin, Laboratory studies, anaerobic conditions										
Soil name	Soil type	pH (CaCl ₂)	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
Bruch West	Loamy sand	7.5	20	Flooded	3	9	-	-	-	Review Report, 2004
Maximum (n=2)							3			
pH-dependency: y/n							n			

Table 8.3-7: Summary of anaerobic degradation rates for BF 500-3 - laboratory studies

BF 500-3, Laboratory studies, anaerobic conditions										
Soil name	Soil type	pH (CaCl ₂)	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
Bruch West	Loamy sand	7.3	20	Flooded	60	200	-	-	-	Y/Germany, 2001;
Bruch West	Loamy sand	7.5	20	Flooded	70	231	-	-	-	Review Report, 2004
Maximum (n=2)							70			
pH-dependency: y/n							n			

Table 8.3-8: Summary of anaerobic degradation rates for BF 500-4 - laboratory studies

BF 500-4, Laboratory studies, anaerobic conditions										
Soil name	Soil type	pH (CaCl ₂)	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
Bruch West	Loamy sand	7.3	20	Flooded	8	26	-	-	-	Y/Germany, 2001;
Bruch West	Loamy sand	7.5	20	Flooded	8	25	-	-	-	Review Report, 2004
Maximum (n=2)							8			
pH-dependency: y/n							n			

Table 8.3-9: Summary of anaerobic degradation rates for 500M74 - laboratory studies

500M74, Laboratory studies, anaerobic conditions										
Soil name	Soil type	pH (CaCl ₂)	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
Bruch West	Loamy sand	7.3	20	Flooded	20	65	-	-	-	Y/Germany, 2001; Review Report, 2004
Bruch West	Loamy sand	7.5	20	Flooded	53	177	-	-	-	
Maximum (n=2)							53			
pH-dependency: y/n							n			

Table 8.3-10: Summary of anaerobic degradation rates for 500M75 - laboratory studies

500M75, Laboratory studies, anaerobic conditions											
Soil name	Soil type	pH (CaCl ₂)	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference	
Bruch West	Loamy sand	7.3	20	Flooded	44	146	-	-	-	Y/Germany, 2001; Review Report, 2004	
Bruch West	Loamy sand	7.5	20	Flooded	22	71	-	-	-		
Maximum (n=2)							44				
pH-dependency: y/n							n				

Table 8.3-11: Summary of anaerobic degradation rates for BF 500-5 - laboratory studies

BF 500-5, Laboratory studies, anaerobic conditions										
Soil name	Soil type	pH (CaCl ₂)	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
Bruch West	Loamy sand	7.5	20	Flooded	12	39	-	-	-	Y/Germany, 2001; Review Report, 2004
Maximum (n=1)							39			
pH-dependency: y/n							n			

8.4 Field studies (KCP 9.1.1.2)

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

8.4.1.1 Boscalid and its metabolites

Triggering endpoints

Table 8.4-1: Summary of aerobic degradation rates for Boscalid - field studies: Triggering endpoints

Boscalid, Field studies – Triggering endpoints									
Soil type	Location	pH (CaCl ₂)	Depth (cm)	DissT50 (d) actual	DT90 (d) actual	Kinetic parameters	St. (x ²)	Method of calculation	Evaluated on EU level y/n/ Reference
Silty loam	Germany, Stetten	7.5	-	90 49 28	-	-	-	-	Y/Germany, 2002; Review Report, 2008
Silty sand	Germany, Schifferstadt	5.4	-	208 175 147	-	-	-	-	
Sandy loam	Spain, Manzanilla	7.4	-	27	-	-	-	-	
Sandy loam	Spain, Alcala del Rio	7.7	-	78	-	-	-	-	
Loamy sand	Germany, Grossharrie	6.1	-	144	-	-	-	-	
Loamy sand	Sweden, Bjärred	5.5	-	-	-	-	-	-	
Maximum (n=9)				208	-				

Modelling endpoints

Table 8.4-2: Summary of aerobic degradation rates for Boscalid - field studies: Modelling endpoints

Boscalid, Field studies – Modelling endpoints						
Soil type	Location	pH (x)	Depth (cm)	DT50 (d) 20°C	Fit, Kinetic	Evaluated on EU level y/n/ Reference
Silty loam	Germany, Stetten	7.5	-	106	-	Y/Germany, 2002; Review Report, 2008
Silty sand	Germany, Schifferstadt	5.4	-	212	-	
Sandy loam	Spain, Manzanilla	7.4	-	-	-	
Sandy loam	Spain, Alcala del Rio	7.7	-	-	-	

Boscalid, Field studies – Modelling endpoints						
Soil type	Location	pH (x)	Depth (cm)	DT50 (d) 20°C	Fit, Kinetic	Evaluated on EU level y/n/ Reference
Loamy sand	Germany, Grossharrie	6.1	-	98	-	
Arithmetic mean / Geometric mean (n=3)				139 / 107		
pH-dependency y/n				n		

8.4.1.2 Pyraclostrobin and its metabolites

Triggering endpoints

Table 8.4-3: Summary of aerobic degradation rates for Pyraclostrobin - field studies: Triggering endpoints

Pyraclostrobin, Field studies – Triggering endpoints									
Soil type	Location	pH	Depth (cm)	DissT50 (d) actual	DT90 (d) actual	Kinetic parameters	St. (σ^2)	Method of calculation	Evaluated on EU level y/n/ Reference
Loamy sand	Germany	6.2	25	30.59	101.6	-	-	-	Y/Germany, 2001; Review Report, 2004
Loamy silt	Germany	6.8	25	34.39	114.2	-	-	-	
Loamy sand	Germany	5.6	25	14.64	48.6	-	-	-	
Sandy loam	Spain	7.6	25	19.52	64.8	-	-	-	
Sandy loam	Spain	7.6	25	85.59*	-	-	-	-	
Loamy sand	Sweden	5.8	25	31.22	103.7	-	-	-	
Maximum (n=6)				34.39	114.2				

*exception not considered as best fit

Modelling endpoints

Table 8.4-4: Summary of aerobic degradation rates for Pyraclostrobin - field studies: Modelling endpoints

Pyraclostrobin, Field studies – Modelling endpoints						
Soil type	Location	pH	Depth (cm)	DT50 (d) 20°C, pF2	Fit, Kinetic	Evaluated on EU level y/n/ Reference
Loamy sand	Germany	6.2	25	30.59	1 st order kinetics Best fit	Y/Germany, 2001; Review Report, 2004
Loamy silt	Germany	6.8	25	34.39		
Loamy sand	Germany	5.6	25	14.64		
Sandy loam	Spain	7.6	25	19.52		

Pyraclostrobin, Field studies – Modelling endpoints						
Soil type	Location	pH	Depth (cm)	DT50 (d) 20°C, pF2	Fit, Kinetic	Evaluated on EU level y/n/ Reference
Sandy loam	Spain	7.6	25	85.59*		
Loamy sand	Sweden	5.8	25	31.22		
Maximum (n=6)				34.39		
pH-dependency y/n				n		

*exception not considered as best fit

8.4.2 Soil accumulation testing (KCP 9.1.1.2.2)

8.4.2.1 Boscalid and its metabolites

Two soil accumulation studies were peer review (Review Report 2008):

1. Germany, 1999-2003, loamy sand/sandy loam, application to vines (3 x 700 g as/ha = 2100 g as/ha); measured maximum plateau: mean 2900 g as/ha (138% of applied rate)
2. Germany, sandy loam, 1998-2004 and ongoing, 3-year rotation with vegetables (2100 g as/ha), vegetables (1700 g as/ha) and cereals (no application); measured maximum: 2545 g as/ha (150% of applied rate in the preceding year).

8.4.2.2 Pyraclostrobin and its metabolites

Not required for Pyraclostrobin.

No additional soil accumulation studies are required because the field soil studies indicate that pyraclostrobin will be rapidly degraded in soil. The DT₅₀ values are always much less than 100 days and the DT₉₀ values are much less than 365 days. As regards pyraclostrobin metabolites the soil accumulation risk is addressed via PECsoil calculations.

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 substance.

8.5.1 Boscalid and its metabolites

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

Boscalid							
Soil name	Soil type*	OC (%)	pH (CaCl ₂)	Kf (mL/g)	Kfoc (mL/g)	1/n (-)	Evaluated on EU level y/n/ Reference
LUFA 2.2	Sand / loamy	2.5	5.8	27.8	1110	0.875	Y/Germany, 2002; Review

Boscalid							
Soil name	Soil type*	OC (%)	pH (CaCl ₂)	Kf (mL/g)	Kfoc (mL/g)	1/n (-)	Evaluated on EU level y/n/ Reference
	sand						Report, 2008
Bruch West	Loamy sand	1.5	7.5	7.6	507	0.870	
Li 35b	Loamy sand	1.1	6.5	6.5	594	0.839	
USA 538-30-5	Loamy sand	0.4	5.8	3.9	987	0.887	
USA 538-31-2	Silty loamy sand	0.5	5.2	3.3	655	0.860	
Canada 95024	Sandy loam	3.4	7.5	26.4	776	0.851	
Geometric mean (n=6)					742.6	-	
Arithmetic mean (n=6)					-	0.864	
pH-dependency y/n					n		

*German classification

8.5.2 Pyraclostrobin and its metabolites

Table 8.5-2: Summary of soil adsorption/desorption for Pyraclostrobin

Pyraclostrobin							
Soil name	Soil type	OC (%)	pH (CaCl ₂)	Kf (mL/g)	Kfoc (mL/g)	1/n (-)	Evaluated on EU level y/n/ Reference
Li 35 b, Limburgerhof, germany	Sand	0.8	6.4	-	7500	0.896	Y/Germany, 2001; Review Report, 2004
LUFA 2.2, Speyer, Germany	Loamy sand	1.9	5.6	-	16000	1.025	
Bruch West, Limburgerhof, Germany	Sandy loam	1.8	7.3	-	7889	1.012	
USA, 538-30-5	Loam sand	0.5	5.9	-	6000	0.861	
USA, 538-31-2	Sandy loam	0.6	5.3	-	9000	0.873	
CAN-95024/RCN 95012	Sandy loam	3.9	7.6	-	9436	1.005	
Geometric mean (n=6)					8855.9	-	
Arithmetic mean (n=6)					-	0.945	
pH-dependency y/n					n		

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

BF 500-3							
Soil Name	Soil Type	OC (%)	pH (CaCl ₂)	Kf (mL/g)	Kfoc (mL/g)	1/n (-)	Evaluated on EU level y/n/ Reference
Li 35 b, Limburgerhof, germany	Loam sand	1.1	6.5	-	6750	0.802	Y/Germany, 2001; Review Report, 2004
LUFA 2.2, Speyer, Germany	Sand/loamy sand	2.5	5.8	-	10700	0.942	
Bruch West, Limburgerhof, Germany	Sandy loam	1.5	7.5	-	4240	0.688	
USA, 538-30-5	Loamy sand	0.4	5.8	-	11800	0.942	
USA, 538-31-2	Loam	0.5	5.2	-	12000	0.773	
CAN-95024/RCN 95012	Sandy clay loam	3.4	7.5	-	10400	0.831	
Geometric mean (n=6)					8757.1	-	
Arithmetic mean (n=6)					-	0.83	
pH-dependency y/n n							

Table 8.5-4: Summary of soil adsorption/desorption for BF 500-6

BF 500-6							
Soil Name	Soil Type	OC (%)	pH (CaCl ₂)	Kf (mL/g)	Kfoc (mL/g)	1/n (-)	Evaluated on EU level y/n/ Reference
Li 35 b, Limburgerhof, germany	Loam sand	1.1	6.5	-	31830	-	Y/Germany, 2001; Review Report, 2004
LUFA 2.2, Speyer, Germany	Sand/loamy sand	2.5	5.8	-	3360	-	
Bruch West, Limburgerhof, Germany	Sandy loam	1.5	7.5	-	16550	-	
USA, 538-30-5	Loamy sand	0.4	5.8	-	91650	-	
USA, 538-31-2	Loam	0.5	5.2	-	126800	-	
CAN-95024/RCN 95012	Sandy clay loam	3.4	7.5	-	18500	-	
Geometric mean (n=6)					26919.5	-	
Arithmetic mean (n=6)					-	-	
pH-dependency y/n				n			

Table 8.5-5: Summary of soil adsorption/desorption for BF 500-7

BF 500-7							
Soil Name	Soil Type	OC (%)	pH (CaCl ₂)	Kf (mL/g)	Kfoc (mL/g)	1/n (-)	Evaluated on EU level y/n/ Reference
Li 35 b, Limburgerhof, germany	Loam sand	1.1	6.5	-	37950	-	Y/Germany, 2001; Review Report, 2004
LUFA 2.2, Speyer, Germany	Sand/loamy sand	2.5	5.8	-	4020	-	
Bruch West, Limburgerhof, Germany	Sandy loam	1.5	7.5	-	29950	-	
USA, 538-30-5	Loamy sand	0.4	5.8	-	135900	-	
USA, 538-31-2	Loam	0.5	5.2	-	149900	-	
CAN-95024/RCN 95012	Sandy clay loam	3.4	7.5	-	15950	-	
Geometric mean (n=6)					33775.6	-	
Arithmetic mean (n=6)					-	-	
pH-dependency y/n n							

8.5.3 Column leaching (KCP 9.1.2.1)

8.5.3.1 Boscalid and its metabolites

Table 8.5-6: Summary of soil column leaching for Boscalid

Boscalid					
Soil name	Soil type	OC (%)	pH (CaCl ₂)	Leachate (Total)	Evaluated on EU level y/n/ Reference
Lufa 2.1, Speyer, Germany	Sand	0.6	6.0	0.04% AR	Y/Germany, 2002; Review Report, 2008

8.5.3.2 Pyraclostrobin and its metabolites

Table 8.5-7: Summary of soil column leaching for Pyraclostrobin

Pyraclostrobin					
Soil name	Soil type	OC (%)	pH (CaCl ₂)	Leachate (Total, in 393 ml)	Evaluated on EU level y/n/ Reference
Lufa 2.1, Speyer, Germany	Sand	0.5	5.4	0	Y/Germany, 2001; Review Report, 2004
LUFA 2.2, Speyer, Germany	Loamy sand	2.1	5.4	0	
Li 35 b, Limburgerhof, Germany	Loamy sand	1.0	6.5	0	
Bruch West, Limburgerhof, Germany	Sandy loam	2.0	7.5	0	
LUFA 2.1, Speyer, Germany	Loamy sand	0.5	5.4	0	

8.5.4 Lysimeter studies (KCP 9.1.2.2)

No lysimeter study was provided during the EU Review of Boscalid and Pyraclostrobin.

8.5.5 Field leaching studies (KCP 9.1.2.3)

No field leaching study was provided during the EU Review of Boscalid and Pyraclostrobin.

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 substance.

8.6.1 Boscalid and its metabolites

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

Boscalid Distribution (max. water 17.4 % after 100 days, sediment 79.9 % after 100 days)										
Wa-ter/sediment system	pH wa-ter/ sed.	DegT50 whole syst. (d)	DegT90 whole syst. (d)	Kinet-ic, Fit	DissT50 water (d)	DissT90 water (d)	Kinet-ic, Fit	DissT50 sed. (d)	Kinet-ic, Fit	Evaluated on EU level y/n/ Reference
Pond system	8.5	>100	-	-	9	133	-	-	-	Y/Germany

Boscalid Distribution (max. water 17.4 % after 100 days, sediment 79.9 % after 100 days)										
Wa- ter/sediment system	pH wa- ter/ sed.	DegT5 0 whole syst. (d)	DegT9 0 whole syst. (d)	Kinet- ic, Fit	DissT5 0 water (d)	DissT9 0 water (d)	Kinet- ic, Fit	DissT5 0 sed. (d)	Kinet- ic, Fit	Evaluated on EU level y/n/ Refer- ence
River system	8.1	>100	-	-	3	43	-	-	-	, 2002; Review Report, 2008
Geometric mean (n=2)		>100	-		5.2	75.62		-		-
Plateau in sediment after 8 years: 217% (calculation)									SANCO/3919/ 2007-rev.5	

8.6.2 Pyraclostrobin and its metabolites

Table 8.6-2: Summary of degradation in water/sediment of Pyraclostrobin

Pyraclostrobin Distribution (max. sediment 62.1 % after 2 days)										
Water/sediment system	pH water/ sed.	DegT50 whole syst. (d)	DegT90 whole syst. (d)	Kinetic, Fit	DissT50 water (d)	DissT90 water (d)	Kinetic, Fit	DissT50 sed. (d)	Kinetic, Fit	Evaluated on EU level y/n/ Reference
Pond system	8.4	27	89	Best fit	3	41	Best fit	-	-	Y/Review Report, 2004
Pond system	8.4	29	-	1 st order	8.7	-	1 st order	33	1 st order	
River system	8.1	29	96	Best fit	1	9	Best fit	-	-	
River system	8.1	-	-	1 st order	1	-	1 st order	9	1 st order	
Maximum (n=2-4)		29	96		8.7	41		33		

Table 8.6-3: Summary of observed metabolites

BF 500-3 Water/sediment system	Max. in water 2.3 %; Max. in sediment 12 % after 100 d (pond system); Max. in sediment 65.7 % after 14 d (river sydtem)	Y/Review Report, 2004
BF 500-6 Water/sediment system	Max. in sediment 6.5 % after 61 d (pond sydtem)	Y/Review Report, 2004
BF 500-7 Water/sediment system	Max. in sediment 6.3 % after 61 d (pond sydtem)	Y/Review Report, 2004

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

8.7.1 Justification for new endpoints

There is not deviation from the EU agreed endpoints.

8.7.2 Active substances and relevant metabolites

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

Use No.	1	2, 3	4	5	6	8	9	10, 11	12	13	14	15,16,17,19,20	18
Crop	Sugarbeet	Tomato	Carrots	Onion	Cabbage	Strawb.	Cherry	Raspb., blackc.	Beetroot	Celery root	Parsnip, parsley	Radish, horseradish, turnip, chicory roots	Swedes/rutabagas
Application rate (g as/ha)	Boscalid: 400 Pyraclostrobin: 100				Bosc.: 267 Pyr.: 67	Bosc.: 481 Pyr.: 121	Bosc.: 267 Pyr.: 67	Bosc.: 481 Pyr.: 121	Bosc.: 267 Pyr.: 67	Bosc.: 400 Pyr.: 100	Bosc.: 200 Pyr.: 50	Bosc.: 400 Pyr.: 100	Bosc.: 267 Pyr.: 67
Number of applications/interval	2/8	3/8	2/8	2/14	3/7	2/5		2/7	2/10		2/21	2/14	2/10
Crop interception (%)	70		80	40	70	60			25				
Depth of soil layer (relevant for plateau concentration) (cm)	20 cm (tillage)						5		20 cm (tillage)				
Model	HSE PECsoil Calculator v1.0												

Use No.	21	22*	24	25	26	27	28	29	30
Crop	Shallot	Onion “7 years old”	Aubergine, eggplant		Ornamentals in field			Red and white currant	Salsifies

Application rate (g as/ha)	Bosc.: 267 Pyr.: 67	Bosc.: 400 Pyr.: 100	Bosc.: 400 Pyr.: 100		Bos.: 26.7 Pyr.: 6.7	Bos.: 48.1 Pyr.: 12.1	Bos.: 40.1 Pyr.: 10.1	Bosc.: 481 Pyr.: 121	Bosc.: 400 Pyr.: 100
Number of applications/interval	2/14	2/21	2/8	3/10	2/7				2/8
Crop interception (%)	10		70		10/50**			60	80
Depth of soil layer (relevant for plateau concentration) (cm)	20 cm (tillage)				5/20***			5	20
Model	HSE PECsoil Calculator v1.0								

***Worst case for PECsoil calculations**

****10 and 50% interception for onions and vines as surrogate crops respectively**

*****5 and 20cm of depth for vines and onions as surrogate crops respectively**

The green house uses have not been considered for PECsoil calculations because are not considered relevant under the definition of a green-house according to the EU Regulation 1107/2009. In EU Regulation 1107/2009 a 'greenhouse' is defined as “[...] a walk-in, static, closed place of crops production with a usually translucent outer shell, which allows controlled exchange of material and energy with the surroundings and prevents release of plant protection products (PPPs) into the environment.” Transfer to soil is not considered relevant.

Table 8.7-2: Input parameter for active substance(s) and relevant metabolite(s) for PEC_{soil} calculation

Compound	Molecular weight (g/mol)	Max. occurrence (%)	DT50 (days)	Value in accordance to EU end-point y/n/ Reference
Boscalid	343.21	-	208 d (Maximum, field studies)	Review Report, 2008
Pyraclostrobin	387.82	-	55 d (Maximum, field studies)	Review Report, 2004
BF 500-6	611.5	31	166 d (Maximum, laboratory studies)	Review Report, 2004 and DAR
BF 500-7	595.5	13	159 d (Maximum, laboratory studies)	Review Report, 2004 and DAR

8.7.2.1 Boscalid

Table 8.7-3: PEC_{soil} for Boscalid on onion “7 years old”

PEC_{soil} (mg/kg)		Onion “7 years old”			
		Single application		Multiple applications	
		Actual	TWA	Actual	TWA
Initial		0.480	-	0.928	-
Short term	24h	0.478	0.479	0.924	0.926
	2d	0.477	0.478	0.921	0.924
	4d	0.474	0.477	0.915	0.921
Long term	7d	0.469	0.474	0.906	0.917
	14d	0.458	0.469	0.885	0.906
	21d	0.448	0.464	0.865	0.896
	28d	0.437	0.458	0.845	0.886
	50d	0.406	0.442	0.785	0.854
	100d	0.344	0.408	0.665	0.789
Plateau concentration (20 cm) after year 7		-	-	0.105	-
$PEC_{accumulation}$ ($PEC_{act} + PEC_{soil \text{ plateau}}$)		-	-	1.033	-

8.7.2.2 Pyraclostrobin and its metabolites

Table 8.7-4: PEC_{soil} for Pyraclostrobin on onion “7 years old”

PEC_{soil}	Onion “7 years old”
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(mg/kg)		Single application		Multiple applications	
		Actual	TWA	Actual	TWA
Initial		0.120		0.199	
Short term	24h	0.118	0.119	0.195	0.197
	2d	0.115	0.118	0.191	0.195
	4d	0.111	0.115	0.183	0.191
Long term	7d	0.104	0.112	0.172	0.185
	14d	0.091	0.105	0.150	0.173
	21d	0.079	0.098	0.130	0.162
	28d	0.068	0.092	0.113	0.152
	50d	0.044	0.076	0.073	0.125
	100d	0.016	0.052	0.026	0.085
Plateau concentration (20 cm) after year		-	-	-	-
PEC _{accumulation} (PEC _{act} + PEC _{soil plateau})		-	-	-	-

PEC_{soil} of Pyraclostrobin metabolites

Table 8.7-5: PEC_{soil} for BF 500-6 on onion “7 years old”

PEC _{soil} (mg/kg)		Onion “7 years old”			
		Single application		Multiple applications	
		Actual	TWA	Actual	TWA
Initial		0.059	-	0.112	-
Short term	24h	0.058	0.059	0.112	0.112
	2d	0.058	0.058	0.111	0.112
	4d	0.058	0.058	0.111	0.111
Long term	7d	0.057	0.058	0.109	0.111
	14d	0.055	0.057	0.106	0.109
	21d	0.054	0.056	0.103	0.108
	28d	0.052	0.055	0.100	0.106
	50d	0.048	0.053	0.091	0.101
	100d	0.039	0.048	0.074	0.092
Plateau concentration (20 cm) after year 5		-	-	0.009	-
PEC _{accumulation} (PEC _{act} + PEC _{soil plateau})		-	-	0.121	-

Table 8.7-6: PEC_{soil} for BF 500-7 on onion “7 years old”

PEC _{soil} (mg/kg)		Onion “7 years old”	
		Single application	Multiple applications

		Actual	TWA	Actual	TWA
Initial		0.024	-	0.046	-
Short term	24h	0.024	0.024	0.046	0.046
	2d	0.024	0.024	0.045	0.046
	4d	0.024	0.024	0.045	0.045
Long term	7d	0.023	0.024	0.044	0.045
	14d	0.023	0.023	0.043	0.044
	21d	0.022	0.023	0.042	0.044
	28d	0.021	0.023	0.041	0.043
	50d	0.019	0.022	0.037	0.041
	100d	0.015	0.019	0.030	0.037
Plateau concentration (20 cm) after year 2		-	-	0.002	-
PEC _{accumulation} (PEC _{act} + PEC _{soil plateau})		-	-	0.048	-

8.7.2.3 PEC_{soil} of CASINO ROYALE

Table 8.7-3: PEC_{soil} for CASINO ROYALE worst case onion “7 years old”

Active substance/preparation	Application rate (g/ha)	Interception (%)	PEC _{act} (mg/kg)
Boscalid+Pyraclostrobin/CASINO ROYALE	3000	10	3.6

zRMS comments:

Boscalid

PECs calculations have been accepted. The calculations cover proposed GAP. Soil Parameters used for the calculations were considered at the EU level. Accumulated concentration was calculated for the boscalid by assuming distribution of plateau concentration through either plough layer (20 cm annual crops).

The crop interception assumed in calculations is in line with the most recent version of the FOCUS Groundwater Guidance of 2014

Agreed with onion choice (worst case) as representative crop to cover all the intended uses.

No PEC_{soil} calculations were performed for metabolites of boscalid because metabolites no were found in amounts greater than 10% of the applied parent.

Accumulated concentration is been calculated for the a.s. by assuming distribution of plateau concentration through either plough layer (20 cm annual crops and 5 cm permanent crop).

Pyraclostrobin

PECs calculations have been accepted. The calculations cover proposed GAP. Soil Parameters used for the calculations were considered at the EU level. Agreed with onion choice (worst case) as representative crop to cover all the intended uses. The crop interception assumed in calculations is in line with the most recent version of the FOCUS Groundwater Guidance of 2014.

The results for PEC soil for the active substances and their metabolites were used for the eco-toxicological risk assessment.

All intended uses are for outdoor uses is considered to cover the **greenhouses uses**. No further calculation is required.

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

8.8.1 Justification for new endpoints

There is not deviation from the EU agreed endpoints.

Active substances and relevant metabolites (KCP 9.2.4.1)

Input parameters related to application for PEC_{gw} calculations

[illegible]

Use No.	21	22	24	25	26	27	28	29	30
Crop	Shallot	Onion “7 years old”	Aubergine, eggplant		Ornamentals in field			Red and white currant	Salsifies
Application rate (g as/ha)	Bosc.: 267 Pyr.: 67	Bosc.: 400 Pyr.: 100	Bosc.: 400 Pyr.: 100		Bos.: 26.7 Pyr.: 6.7	Bos.: 48.1 Pyr.: 12.1	Bos.: 40.1 Pyr.: 10.1	Bosc.: 481 Pyr.: 121	Bosc.: 400 Pyr.: 100
Number of applications/interval	2/14	2/21	2/8	3/10	2/7				2/8
Crop interception (%)	10		70		10/50*			60	80
Frequency of application	Annual								

Models used for calculation	FOCUS PEARL v4.4.4, FOCUS PELMO v5.5.3
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****10 and 50% interception for onions and vines as surrogate crops respectively**

Table 8.8-2: Ground water risk envelope

Plant protection product	CASINO ROYALE							
Use No.	1	2, ,24,25	4,12,13,15,16,17,18,19,20,30	5,21,22,26,27,28	6,8,14	8	9	10,11,26,27,28,29
Crop	Sugarbeet	Tomato, and eggplant (tomato and potato)	Carrots, beetroot, celery root, radish, horseradish, swedes, turnip, chicory roots and salsifies (carrots)	Onion, shallot, onion “seven years old and ornamentals (onion)	Cabbage, parsnip and parsley (cabbage)	Strawberry	Cherry (apple)	Raspberry, blackcurrant, ornamentals, redcurrant and white currant (vines)
Application rate (g as/ha)	Boscalid: 400 Pyraclostrobin: 100				Boscalid: 267 Pyraclostrobin: 67*	Boscalid: 481 Pyraclostrobin: 121	Boscalid: 267 Pyraclostrobin: 67	Boscalid: 481 Pyraclostrobin: 121*
Number of applications/interval (d)	2/8	3/8*	2/8*	2/7*	3/7*	2/5	2/5	2/7*
Interception (%)	70	50*	25*	10*	25*	60*		

*Worst case

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

Scenario	Application window	First application*								
	Sugar beet	Tomato (BBCH 12 worst case)	Root veg. (BBCH 11 worst case)		Onion. (BBCH 13 worst case)	Cabbage (BBCH 15 worst case)		Strawberry	Apple	Vines (BBCH 13 worst case)
			1 st crop	2 nd crop		1 st crop	2 nd crop			
Châteaudun	05/06	14/05	15/03	14/07	16/05	11/05	19/08	-	16/05	14/04
Hamburg	30/06	15/05**	15/03	14/07	16/05	11/05	19/08	30/04	12/06	09/05
Jokioinen	07/07	-	12/06	-	01/06	14/07	-	25/06	22/05	-

Scenario	Application window	First application*								
	Sugar beet	Tomato (BBCH 12 worst case)	Root veg. (BBCH 11 worst case)		Onion. (BBCH 13 worst case)	Cabbage (BBCH 15 worst case)		Strawberry	Apple	Vines (BBCH 13 worst case)
			1 st crop	2 nd crop		1 st crop	2 nd crop			
Kremsmünster	30/06	15/05**	15/03	14/07	16/05	11/05	19/08	30/04	12/06	09/05
Okehampton	04/07	-	-	-	-	-	-	-	26/05	-
Piacenza	25/05	14/05	-	-	-	-	-	-	16/05	14/04
Porto	10/04	22/03	07/03	28/07	24/03	08/04	16/08	-	04/06	30/03
Sevilla	04/02	19/04	-	-	-	01/04	16/07	30/04	12/05	09/04
Thiva	03/06	14/04	19/03	19/06	01/05	08/09	-	-	04/06	27/03

*According to AppDate v3.06 (28 June 2019)

**Potato as surrogate crop

The green house uses have not been considered for PECgw calculations because are not considered relevant under the definition of a green-house according to the EU Regulation 1107/2009. In EU Regulation 1107/2009 a 'greenhouse' is defined as “[...] a walk-in, static, closed place of crops production with a usually translucent outer shell, which allows controlled exchange of material and energy with the surroundings and prevents release of plant protection products (PPPs) into the environment.” Transfer to soil is not considered relevant.

8.8.2.1 Boscalid and its metabolites

Table 8.8-3: Input parameters related to active substance Boscalid for PEC_{gw} calculations

Compound	Boscalid	Value in accordance with EU endpoint y/n/ Reference*
Molecular weight (g/mol)	343.21	Review Report, 2008
Water solubility (mg/l):	4.6 at 20°C	
Saturated vapour pressure (Pa):	7.2×10^{-7} at 20°C	
DT ₅₀ in soil (d)	208 d (Maximum, field studies)	
K _{foc} /K _{fom} (mL/g)	742.6 / 430.7 (geomean, n = 6)	
1/n	0.864 (arithmetic mean, n = 6)	
Plant uptake factor	0	

Table 8.8-4: PEC_{gw} Boscalid on sugar beet (with FOCUS PEARL v4.4.4, PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)	
		PEARL	PELMO
Sugar beet	Châteaudun	0.004	<0.001
	Hamburg	0.003	0.001
	Jokioinen	<0.001	<0.001
	Kremsmünster	<0.001	<0.001
	Okehampton	0.002	0.003
	Piacenza	0.003	0.003
	Porto	<0.001	0.001
	Sevilla	<0.001	<0.001
	Thiva	<0.001	<0.001

Table 8.8-5: PEC_{gw} Boscalid on tomato, eggplant (with FOCUS PEARL v4.4.4, PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)	
		PEARL	PELMO
Tomato	Châteaudun	<0.001	<0.001
	Hamburg	0.022	0.004
	Kremsmünster	0.003	0.001

	Piacenza	0.027	0.026
	Porto	0.003	0.005
	Sevilla	<0.001	<0.001
	Thiva	<0.001	<0.001

Table 8.8-6: PEC_{gw} Boscalid on Carrots (1st and 2nd crop) (with FOCUS PEARL v4.4.4, PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)			
		1 st crop		2 nd crop	
		PEARL	PELMO	PEARL	PELMO
Carrots	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	0.024	0.005	0.027	0.006
	Jokioinen	<0.001	<0.001	-	-
	Kremsmünster	0.004	0.001	0.004	0.001
	Porto	0.002	0.007	0.004	0.010
	Thiva	<0.001	<0.001	<0.001	<0.001

Table 8.8-7: PEC_{gw} Boscalid on onion (with FOCUS PEARL v4.4.4, PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)	
		PEARL	PELMO
Onion	Châteaudun	<0.001	<0.001
	Hamburg	0.038	0.007
	Jokioinen	<0.001	<0.001
	Kremsmünster	0.007	0.003
	Porto	0.002	0.008
	Thiva	<0.001	<0.001

Table 8.8-8: PEC_{gw} Boscalid on Cabbage (1st and 2nd crop) (with FOCUS PEARL v4.4.4, PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)			
		1 st crop		2 nd crop	
		PEARL	PELMO	PEARL	PELMO
Cabbage	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	0.024	0.004	0.029	0.005
	Jokioinen	<0.001	<0.001	-	-
	Kremsmünster	0.002	0.001	0.003	0.001

	Porto	0.004	0.013	0.006	0.018
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	-	-

Table 8.8-9: PEC_{gw} Boscalid on strawberry (with FOCUS PEARL v4.4.4, PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)	
		PEARL	PELMO
Strawberry	Hamburg	0.009	0.002
	Jokioinen	<0.001	<0.001
	Kremsmünster	<0.001	<0.001
	Sevilla	<0.001	<0.001

Table 8.8-10: PEC_{gw} Boscalid on sugar cherry (apple, with FOCUS PEARL v4.4.4, PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)	
		PEARL	PELMO
Cherry	Châteaudun	0.001	0.001
	Hamburg	0.005	0.001
	Jokioinen	<0.001	<0.001
	Kremsmünster	<0.001	<0.001
	Okehampton	0.003	0.005
	Piacenza	0.004	0.017
	Porto	0.001	0.002
	Sevilla	0.001	<0.001
	Thiva	0.002	<0.001

Table 8.8-11: PEC_{gw} Boscalid on berries (vines, with FOCUS PEARL v4.4.4, PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)	
		PEARL	PELMO
Berries	Châteaudun	0.004	0.002
	Hamburg	0.014	0.007
	Kremsmünster	0.004	0.006
	Piacenza	0.016	0.039
	Porto	0.002	0.005

	Sevilla	0.001	<0.001
	Thiva	<0.001	<0.001

zRMS comments:

Boscalid

PECgw calculations have been accepted. The calculations cover proposed uses in GAP. The crop interception assumed in calculations is in line with the most recent version of the FOCUS Groundwater Guidance of 2014. In simulations PUF value of 0 was assumed for all compounds, in line with recommendations of the most recent version of the FOCUS Groundwater Guidance.

According in field studies no metabolite was found in amounts greater than 10% of the applied parent, therefore no PECgw calculations are performed for metabolites of boscalid. No MACRO calculations was required (PECgw < 0.001 µg/L).

Based on Focus PEARL and PELMO simulations . Calculated PECgw values are far below the threshold concentration of 0.1 µg/L for all scenarios and crops.

No unacceptable risk for groundwater was identified.

PL: Cabbage is surrogate crop for strawberry for scenario Kremsmünster

All intended uses are for outdoor uses is considered to cover the **greenhouses uses**. No further calculation is required.

8.8.2.2 Pyraclostrobin and its metabolites

Table 8.8-12: Input parameters related to active substance Pyraclostrobin and metabolites for PEC_{gw} calculations

Compound	Pyraclostrobin	BF 500-6	BF 500-7	BF 500-3	Value in accordance with EU endpoint y/n/ Reference
Molecular weight (g/mol)	387.82	611.5	595.5	357.8	Review Report, 2004 DAR
Water solubility (mg/l):	1.9 at 20°C	1000 at 20°C (default)			
Saturated vapour pressure (Pa):	2.6 x 10 ⁻⁸ at 20°C	0 (default)			
DT ₅₀ in soil (d)	101 d (Maximum, laboratory studies)	166 d (Maximum, laboratory studies)	159 d (Maximum, laboratory studies)	70 d (Maximum, anaerobic laboratory studies)	
K _{foc} /K _{fom} (mL/g)	8855.9 / 5136.8 (geomean, n = 6)	26919.5 / 15614.3 (geomean, n = 6)	33775.6 / 19591.4 (geomean, n = 6)	8757.1 /5079 (geomean, n = 6)	
1/n	0.945 (arithmetic mean, n = 6)	1 (default)	1 (default)	0.83 (arithmetic mean, n = 6)	
Plant uptake factor	0				

Compound	Pyraclostrobin	BF 500-6	BF 500-7	BF 500-3	Value in accordance with EU endpoint y/n/ Reference
Formation fraction	-	1 from BF 500-3	1 from BF 500-3	1 from parent	DAR

Table 8.8-13: PEC_{gw} Pyraclostrobin and metabolites on sugar beet (with FOCUS PEARL v4.4.4 and PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)							
		Pyraclostrobin		BF 500-3		BF 500-6		BF 500-7	
		PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO
Sugar beet	Châteaudun	<0.001	<0.001	<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	<0.001	<0.001
	Jokioinen	<0.001	<0.001	<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	<0.001	<0.001
	Okehampton	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Table 8.8-14: PEC_{gw} Pyraclostrobin and metabolites on tomato (with FOCUS PEARL v4.4.4 and PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)							
		Pyraclostrobin		BF 500-3		BF 500-6		BF 500-7	
		PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO
Tomato	Châteaudun	< 0.001	<0.001	< 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	< 0.001	< 0.001
	Kremsmünster	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Piacenza	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001
	Porto	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001
	Sevilla	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001
	Thiva	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001

Table 8.8-15: PEC_{gw} Pyraclostrobin and metabolites on carrots 1st crop (with FOCUS PEARL v4.4.4 and PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)							
		Pyraclostrobin		BF 500-3		BF 500-6		BF 500-7	
		PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO
Carrots 1 st crop	Châteaudun	< 0.001	<0.001	< 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	< 0.001	<0.001
	Jokioinen	< 0.001	<0.001	< 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	< 0.001	<0.001
	Porto	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001
	Thiva	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001

Table 8.8-16: PEC_{gw} Pyraclostrobin and metabolites on carrots 2nd crop (with FOCUS PEARL v4.4.4 and PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)							
		Pyraclostrobin		BF 500-3		BF 500-6		BF 500-7	
		PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO
Carrots 2 nd crop	Châteaudun	<0.001	<0.001	<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	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Table 8.8-17: PEC_{gw} Pyraclostrobin and metabolites on onion (with FOCUS PEARL v4.4.4 and PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)							
		Pyraclostrobin		BF 500-3		BF 500-6		BF 500-7	
		PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO
Onion	Châteaudun	< 0.001	<0.001	< 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	< 0.001	<0.001
	Jokioinen	< 0.001	<0.001	< 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	< 0.001	<0.001
	Porto	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001
	Thiva	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001

Table 8.8-18: PEC_{gw} Pyraclostrobin and metabolites on cabbage 1st crop (with FOCUS PEARL v4.4.4 and PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)							
		Pyraclostrobin		BF 500-3		BF 500-6		BF 500-7	
		PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO
Cabbage1 st crop	Châteaudun	< 0.001	<0.001	< 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	< 0.001	<0.001
	Jokioinen	< 0.001	<0.001	< 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	< 0.001	<0.001
	Porto	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001
	Thiva	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001

Table 8.8-19: PEC_{gw} Pyraclostrobin and metabolites on cabbage 2nd crop (with FOCUS PEARL v4.4.4 and PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)							
		Pyraclostrobin		BF 500-3		BF 500-6		BF 500-7	
		PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO
Cabbage 2 nd crop	Châteaudun	<0.001	<0.001	<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	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Table 8.8-20: PEC_{gw} Pyraclostrobin and metabolites on strawberry (with FOCUS PEARL v4.4.4 and PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)							
		Pyraclostrobin		BF 500-3		BF 500-6		BF 500-7	
		PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO
Strawberry	Hamburg	< 0.001	<0.001	< 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	< 0.001	<0.001
	Kremsmünster	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001
	Sevilla	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001

Table 8.8-21: PEC_{gw} Pyraclostrobin and metabolites on cherry (apple, with FOCUS PEARL v4.4.4 and PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)							
		Pyraclostrobin		BF 500-3		BF 500-6		BF 500-7	
		PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO
Cherry	Châteaudun	<0.001	<0.001	<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	<0.001	<0.001
	Jokioinen	<0.001	<0.001	<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	<0.001	<0.001
	Okehampton	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Table 8.8-22: PEC_{gw} Pyraclostrobin and metabolites on berries (vines, with FOCUS PEARL v4.4.4 and PELMO v5.5.3)

Crop	Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)							
		Pyraclostrobin		BF 500-3		BF 500-6		BF 500-7	
		PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO
Berries	Châteaudun	<0.001	<0.001	<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	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

PEC_{gw} conclusions

The PEC_{gw} concentration for Boscalid, Pyraclostrobin and its metabolites were all below 0.1 µg/L for all crops and scenarios. Therefore, there is no risk for ground water and no relevance assessment for metabolites were done.

RMS comments:

PEC_{gw} calculations have been accepted. The calculations cover proposed uses in GAP. The crop interception assumed in calculations is in line with the most recent version of the FOCUS Groundwater Guidance of 2014. In simulations PUF value of 0 was assumed for all compounds, in line with recommendations of the most recent version of the FOCUS Groundwater Guidance. No MACRO calculations was required (PEC_{gw} < 0.001 µg/L).

Based on Focus PEARL and PELMO simulations . Calculated PEC_{gw} values for pyraclostrobin and its metabolites are far below the threshold concentration of 0.1 µg/L for all scenarios and crops.
No unacceptable risk for groundwater was identified.

PL: Cabbage is surrogate crop for strawberry for scenario Kremsmünster.

All intended uses are for outdoor uses is considered to cover the **greenhouses uses**. No further calculation is required.

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

8.9.1 Justification for new endpoints

There is not deviation from the EU agreed endpoints.

8.9.2 Active substances, relevant metabolites and the formulation (KCP 9.2.5)

Table 8.9-1: Input parameters related to application for PEC_{SW/SED} calculations

Plant protection product	CASINO ROYALE							
Use No.	1	2, ,24,25	4,12,13,15,16,17,18,19,20,30	5,21,22,26,27,28	6,8,14	9	10,11,26,27,28,29	7,23,26,27,28
Crop	Sugarbeet	Tomato, and eggplant (fruiting vegetables)	Carrots, beetroot, celery root, radish, horseradish, swedes, turnip, chicory roots and salsifies (root vegetables)	Onion, shallot, onion “seven years old and ornamentals (bulb vegetables)	Cabbage, strawberry, parsnip and parsley (leafy vegetables)	Cherry (apple early application as worst case)	Raspberry, blackcurrant, ornamentals, redcurrant and white currant (vines late application as worst case)	Tomato, eggplant and ornamentals (Green house uses worst case)
Application rate (g as/ha)	Boscalid: 400 Pyraclostrobin: 100				Boscalid: 481 Pyraclostrobin: 121*	Boscalid: 267 Pyraclostrobin: 67	Boscalid: 481 Pyraclostrobin: 121*	Boscalid: 534 Pyraclostrobin: 134
Number of applications/interval (d)	2/8	3/8*	2/8*	2/7*	2/5*	2/5	2/7*	2/7
Application window	June-Sep Interception average crop cover	March-May Interception minimal canopy (worst case)				March-May Interception full canopy	June-Sep Interception full canopy	-
Application method	Foliar spray							
CAM (Chemical application method)	CAM 2							-
Soil depth (cm)	4							-
Models used for calculation	FOCUS STEP 1/2 v3.1 FOCUS SWASH v5.3, FOCUS PRZM v4.3.1, FOCUS MACRO v5.5.4, FOCUS TOXWA v5.5, SWAN 5.0.0, TOXSWA v1.2							

*Worst case

Table 8.9-2: FOCUS Step 3 Scenario related input parameters for PEC_{sw/sed} calculations for the application of CASINO ROYALE

Scenario	Application window First application*						
	Sugar beet	Fruiting veg. (BBCH 12 worst case)	Root veg. (BBCH 11 worst case)	Bulb veg. (BBCH 13 worst case)	Leafy veg. (BBCH 15 worst case)	Apple early (BBCH 60 worst case)	Vines late (BBCH 61 worst case)
D3 1 st	15/06	15/05**	03/05	16/05	16/05	12/06	14/06***
D3 2 nd	-	-	-	-	24/08	-	-
D4	20/06	28/05**	-	17/05	15/06	16/06	18/06***
D5	-	-	-	-	-	16/05	-
D6 1 st	-	14/04	03/03	26/05	08/09	-	05/04
D6 2 nd	-	-	-	02/12	-	-	-
R1 1 st	05/06	09/05**	28.04	11/05	11/05	12/06	08/06
R1 2 nd	-	-	-	-	19/08	-	-
R2 1 st	-	22/03	07/03	24/03	08/04	27/06	20/06
R2 2 nd	-	-	28/07	-	16/08	-	-
R3 1 st	13/05	14/05	04/03	24/03	01/04	16/05	25/06
R3 2 nd	-	-	-	-	16/07	-	-
R4 1 st	-	24/04	04/03	24/03	01/04	12/05	11/06
R4 2 nd	-	-	-	-	16/07	-	-

*According to AppDate v3.06 (28 June 2019)

**Potato has been chosen as surrogate crop for these scenarios

***Apple has been chosen as surrogate crop for these scenarios. The drift values used are the same than for vines and have been modified manually

8.9.2.1 Boscalid and its metabolites

Table 8.9-6: Input parameters related to active substance Boscalid for PEC_{sw/sed} calculations STEP 1/2 and 3

Compound	Boscalid	Value in accordance to EU end-point y/n/ Reference
Molecular weight (g/mol)	343.21	Review Report, 2008 and DAR
Saturated vapour pressure (Pa)	7.2×10^{-7} at 20°C	
Water solubility (mg/L)	4.6 at 20°C	
Diffusion coefficient in water (m ² /d)	4.3×10^{-5}	default
Diffusion coefficient in air (m ² /d)	0.43	
K _{foc} /K _{fom} (mL/g)	742.6 / 430.7 (geomean, n = 6)	Review Report,

Compound	Boscalid	Value in accordance to EU end-point y/n/ Reference
Freundlich Exponent 1/n	0.864 (arithmetic mean, n = 6)	2008 and DAR
Plant Uptake	0	default
Wash-Off factor from Crop (1/mm)	0.05 (MACRO) 0.50 (PRZM)	
DT _{50,soil} (d)	208 d (Maximum, field studies)	Review Report, 2008 and DAR
DT _{50,water} (d)	1000	
DT _{50,sed} (d)	1000	
DT _{50,whole system} (d)	1000	
Maximum occurrence observed (% molar basis with respect to the parent)	Sediment: 79.9	

PEC_{sw/sed}

Table 8.9-7: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Boscalid following single/multiple applications of CASINO ROYALE to sugar beet

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw,twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	70.68/141.35	-	68.39/136.78	510.89/1020
Step 2					
Southern Europe	June-Sep	8.16/15.64	Runoff / Drainage	7.75/14.90	57.83/111.25
Northern Europe		6.18/11.72		5.78/11.01	43.11/82.21
Step 3					
D3	ditch	-/1.823	Drift	-/0.179	-/1.388
D4	pond	-/3.306	Drift	-/3.189	-/26.99
D4	stream	-/4.412	Drift	-/2.136	-/9.949
R1	pond	-/1.395	Runoff / erosion	-/1.293	-/10.13
R1	stream	-/4.679	Runoff / erosion	-/0.495	-/11.37
R3	stream	-/5.472	Runoff / erosion	-/0.595	-/5.967

Table 8.9-8: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Boscalid following single/multiple applications of CASINO ROYALE to tomato and eggplant (fruiting vegetables and potato, BBCH 12 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw,twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	70.68/212.03	-	68.39/205.17	510.89/1530
Step 2					
Southern Europe	March-May	22.04/62.78	Runoff / Drainage	21.53/61.55	160.86/459.96
Northern Europe		12.13/33.81		11.68/32.79	87.27/244.95
Step 3					
D3	ditch	2.099/1.528	Drift	0.117/0.174	1.238/1.284
D4	pond	1.795/6.843	Drift	1.734/6.619	15.50/52.62
D4	stream	2.237/7.616	Drift	1.117/4.270	5.504/19.46
D6	ditch	2.556/7.344	Drift	0.403/1.475	3.225/9.236
R1	pond	0.389/1.011	Runoff / erosion	0.346/0.949	3.803/10.12
R1	stream	3.383/8.229	Runoff / erosion	0.225/0.366	2.339/7.839
R2	stream	2.213/2.794	Runoff / erosion	0.125/0.170	5.332/9.244
R3	stream	4.144/9.703	Runoff / erosion	0.210/0.729	2.335/9.399
R4	stream	6.441/	Runoff / erosion	0.538/	4.134/

Table 8.9-9: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Boscalid following single/multiple applications of CASINO ROYALE to carrots, beetroot, celery root, radish, horseradish, swedes, turnip, chicory roots and salsifies (root vegetables, BBCH 11 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw,twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	70.68/141.35	-	68.39/136.78	510.89/1020
Step 2					
Southern Europe	March-May	22.04/43.04	Runoff / Drainage	21.53/42.10	160.86/314.59
Northern Europe		12.13/23.47		11.68/22.67	87.27/169.35
Step 3					
D3	ditch	2.537/2.221	Drift	0.139/0.244	1.471/1.770
D6	ditch	2.891/6.026	Drift	0.557/1.151	4.360/8.069
R1	Pond	0.501/0.866	Runoff / erosion	0.446/0.765	4.556/7.916
R1	stream	3.559/6.032	Runoff / erosion	0.260/0.366	4.111/5.703
R2 1 st	stream	2.210/2.590	Runoff / erosion	0.118/0.252	5.322/11.69

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
R2 2 nd	stream	2.248/2.138	Runoff / erosion	0.184/0.386	23.44/39.42
R3	stream	4.206/5.414	Runoff / erosion	0.250/0.291	2.149/4.642
R4	stream	6.082/7.637	Runoff / erosion	0.225/0.751	3.598/5.677

Table 8.9-10: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Boscalid following single/multiple applications of CASINO ROYALE to onion, shallot, onion “seven years old and ornamentals (bulb vegetables, BBCH 13 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	70.68/141.35	-	68.39/136.78	510.89/1020
Step 2					
Southern Europe	March-May	26.01/50.95	Runoff / Drainage	25.47/49.95	190.29/373.27
Northern Europe		14.11/27.42		13.65/26.60	101.99/198.69
Step 3					
D3	ditch	2.537/2.222	Drift	0.141/0.252	1.486/1.842
D4	pond	1.731/3.893	Drift	1.672/3.768	15.06/31.65
D4	stream	2.079/4.350	Drift	1.074/2.419	5.374/11.62
D6 1 st	ditch	3.293/6.237	Drift	0.637/1.622	6.113/12.54
D6 2 nd	ditch	11.39/19.55	Drift	1.593/3.984	11.42/18.35
R1	pond	0.429/0.830	Runoff / erosion	0.384/0.760	4.568/8.378
R1	stream	3.625/5.285	Runoff / erosion	0.243/0.268	3.164/5.422
R2	stream	2.213/2.064	Runoff / erosion	0.046/0.117	5.931/11.01
R3	stream	3.386/7.539	Runoff / erosion	0.161/0.391	2.744/5.943
R4	stream	5.679/10.76	Runoff / erosion	0.470/0.887	3.747/7.453

Table 8.9-11: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Boscalid following single/multiple applications of CASINO ROYALE to cabbage, strawberry, parsnip and parsley (leafy vegetables, BBCH 15 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	70.68/141.35	-	68.39/136.78	510.89/1020
Step 2					
Southern Europe	March-May June -Sept	22.04/43.24	Runoff / Drainage	21.53/42.30	160.86/316.06
Northern		12.13/23.57		11.68/22.77	87.27/170.10

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Europe					
Step 3					
D3 1 st	ditch	3.051/2.675	Drift	0.170/0.300	1.775/2.238
D3 2 nd	ditch	3.036/2.660	Drift	0.104/0.188	1.250/1.640
D4	pond	1.702/4.087	Drift	1.644/3.949	14.79/32.93
D4	stream	2.320/5.017	Drift	1.053/2.537	5.134/11.88
D6	ditch	7.978/18.81	Drift	1.250/2.843	9.521/19.96
R1 1 st	pond	0.857/1.813	Runoff / erosion	0.794/1.720	8.298/16.10
R1 2 nd	pond	0.626/1.234	Runoff / erosion	0.552/1.092	5.753/10.67
R1 1 st	stream	3.955/5.954	Runoff / erosion	0.304/0.334	4.006/8.331
R1 2 nd	stream	2.779/6.266	Runoff / erosion	0.137/0.306	1.793/3.814
R2 1 st	stream	2.662/2.302	Runoff / erosion	0.049/0.120	5.483/9.378
R2 2 nd	stream	2.704/2.338	Runoff / erosion	0.055/0.126	4.284/7.631
R3 1 st	stream	3.961/8.330	Runoff / erosion	0.239/0.485	3.702/7.741
R3 2 nd	stream	4.177/8.301	Runoff / erosion	0.512/0.923	6.409/12.62
R4 1 st	stream	5.896/13.33	Runoff / erosion	0.525/1.183	4.033/8.642
R4 2 nd	stream	5.929/10.83	Runoff / erosion	0.599/1.177	4.310/8.511

Table 8.9-12: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Boscalid following single/multiple applications of CASINO ROYALE to cherry (apple early application as worst case, BBCH 60)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw,twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	70.71/141.41		57.67/115.33	428.76/857.52
Step 2					
Southern Europe	March-May	25.99/39.51	Runoff / Drainage	18.38/34.84	142.47/259.63
Northern Europe		25.99/36.36		16.42/28.98	119.55/214.16
Step 3					
D3	ditch	20.81/17.97	Drift	1.754/3.089	14.42/17.84
D4	pond	1.261/2.072	Drift	1.080/1.832	8.928/17.79
D4	stream	22.05/18.86	Drift	0.287/0.529	4.043/4.734
D5	pond	1.345/2.323	Drift	1.176/2.109	10.93/22.94
D5	stream	23.82/20.35	Drift	0.427/0.737	5.815/6.521
R1	pond	1.261/2.082	Runoff / erosion	1.092/1.791	7.126/11.77
R1	stream	16.90/14.43	Runoff / erosion	0.241/0.317	2.497/2.818

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
R2	stream	22.65/19.34	Runoff / erosion	0.116/0.198	1.781/2.092
R3	stream	23.65/20.34	Runoff / erosion	0.324/0.639	4.507/5.737
R4	stream	16.52/14.42	Runoff / erosion	0.133/0.324	1.453/2.399

Apple has been chosen as surrogate crop for D3 and D4 scenarios. The drift values used are the same than for vines and have been modified manually.

Table 8.9-13: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Boscalid following single/multiple applications of CASINO ROYALE to raspberry, blackcurrant, ornamentals, redcurrant and white currant (vines and apple late application as worst case, BBCH 61)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw,twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	93.44/186.87		86.55/173.11	645.85/1290
Step 2					
Southern Europe	June-Sept	17.28/32.54	Runoff / Drainage	15.90/30.11	118.66/224.63
Northern Europe		14.10/26.26		12.75/23.86	95.06/177.98
Step 3					
D3	ditch	8.216/7.294	Drift	0.692/1.252	5.955/7.604
D4	pond	0.294/0.479	Drift	0.249/0.420	2.026/3.471
D4	stream	7.903/6.985	Drift	0.103/0.187	1.117/1.807
D6	ditch	8.124/7.391	Drift	1.196/2.605	6.873/14.98
R1	pond	0.346/0.761	Runoff / erosion	0.306/0.666	2.589/4.955
R1	stream	6.038/5.327	Runoff / erosion	0.167/0.274	2.073/4.152
R2	stream	8.117/7.161	Runoff / erosion	0.041/0.073	0.650/0.968
R3	stream	8.502/7.530	Runoff / erosion	0.165/0.363	1.814/3.615
R4	stream	6.055/5.342	Runoff / erosion	0.106/0.203	1.527/2.908

FOCUS Step 4

Table 8.9-14: Global maximum PEC_{sw} values for Boscalid, following single/multiple applications of CASINO ROYALE to onion, shallot, onion “seven years old and ornamentals (bulb vegetables, BBCH 13 as worst case) according to the Central EU zone GAP and to surface water Step 4

PEC _{sw} (µg/L)	Scenario	STEP 4 Boscalid
Nozzle reduction	Vegetative strip (m)	None

	No spray buffer (m)	5
None	D6 2 nd ditch	-/19.55

Table 8.9-15: Global maximum PEC_{sw} values for Boscalid, following single/multiple applications of CASINO ROYALE to cabbage, strawberry, parsnip and parsley (leafy vegetables, BBCH 15 as worst case) according to the Central EU zone GAP and to surface water Step 4

PEC _{sw} (µg/L)	Scenario	STEP 4 Boscalid		
Nozzle reduction	Vegetative strip (m)	None	5*	10
	No spray buffer (m)	5	5	10
None	D6 ditch	-/18.81	-/-	-/-
	R4 1 st stream	-/13.33	-/8.693	-/6.991

*The value used for reduction in run-off volume, run-off flux, erosion mass and erosion flux was 0.4, according to the Austrian Environmental Agency AGES.

Table 8.9-16: Global maximum PEC_{sw} values for Boscalid, following single/multiple applications of CASINO ROYALE to cherry (apple early application as worst case, BBCH 60) according to the Central EU zone GAP and to surface water Step 4

PEC _{sw} (µg/L)	Scenario	STEP 4 Boscalid		
Nozzle reduction	Vegetative strip (m)	None		
	No spray buffer (m)	5	10	15
None	D3 ditch	16.35/13.85	10.04/8.184	-/-
50 %		8.172/6.927	-/-	-/-
None	D4 stream	18.95/16.01	11.63/9.461	-/-
50 %		9.475/8.007	-/-	-/-
None	D5 stream	20.46/17.28	12.56/10.21	5.652/-
50 %		10.23/8.638	6.282/-	-/-
None	R1 stream	14.52/12.25	8.915/-	-/-
50 %		7.261/-	-/-	-/-
None	R2 stream	19.46/16.42	11.95/9.699	-/-
50 %		9.732/8.209	-/-	-/-
None	R3 stream	20.32/17.26	12.48/10.20	-/-
50 %		10.16/8.632	-/-	-/-
None	R4 stream	14.19/12.25	8.714/-	-/-
50 %		7.097/-	-/-	-/-

zRMS comments:

Boscalid

PEC_{sw}/sed calculations have been accepted.

According to DAR in field studies no metabolites were found in amounts greater than 10% of the applied parent, therefore no PEC_{sw}/sed calculations are performed for metabolites of boscalid.

The calculations cover proposed uses in GAP.

For PEC_{sw}/sed calculations at STEP 4, the values used for reduction in run off volume and flux and erosion mass and flux is 0.5 and 0.8 for 5 meters of vegetative buffer strip according to the Austrian Environmental Agency (AGES) and the values uses for reduction in run off volume and flux and erosion mass and flux were 0.7 and 0.9 respectively for 15 meters of vegetative buffer strip.

In opinion of zRMS-PL, the Step 4 PEC_{sw} calculations are not accepted because of according to Working Document of the Central Zone in the Authorisation of Plant Protection Products (2018), the following approaches for simulating in Step 4 are recommended for the Core Assessment: *Landscape And Mitigation Factors In Aquatic Risk Assessment. Volume 1. Extended Summary and Recommendations". Report of the FOCUS Working Group on Landscape and Mitigation Factors in Ecological Risk Assessment, EC Document Reference SANCO/10422/2005 v2.0. 169 pp and FOCUS (2007) and Working Document of the Central Zone in the Autorisation of Plant Protection Products (Environmental Fate and Behaviour. Ver.1.rev1. 2018).*

However, 5 or 15 meters of vegetative buffer strip can be used at national level.

The PEC_{sw} in STEP4 and mitigation measure should be considered by individual MS.

8.9.2.2 Pyraclostrobin and its metabolites

Table 8.9-17: Input parameters related to active substance Pyraclostrobin and metabolites for PEC_{sw/sed} calculations STEP 1/2 and 3(4)

Compound	Pyra-clostrobin	BF 500-6	BF 500-7	BF 500-3	BF 500-11*	BF 500-13*	BF 500-14*	BF 500-15*	500 M 58*	Value in accordance to EU end-point y/n/ Reference
Molecular weight (g/mol)	387.82	611.5	595.5	357.8	277.3	247.3	387.8	176.2	339.3	Y/Review Report, 2004
Saturated vapour pressure (Pa)	2.6 x 10 ⁻⁸ at 20°C	not required for Step 1+2								
Water solubility (mg/L)	1.9 at 20°C	1000 at 20°C (default)								
Diffusion coefficient in water (m ² /d)	4.3 x 10 ⁻⁵	not required for Step 1+2/								default
Diffusion coefficient in air (m ² /d)	0.43									
K _{foc} /K _{fom} (mL/g)	8855.9 / 5136.8 (geomean, n = 6)	26919.5 / 15614.3 (geomean, n = 6)	33775.6 / 19591.4 (geomean, n = 6)	8757.1 /5079 (geomean, n = 6)	1 (default)					Y/Review Report, 2004
Freundlich Exponent 1/n	0.945 (arithmetic mean, n = 6)	not required for Step 1+2								
Plant Uptake	0									
Wash-Off factor from Crop (1/mm)	0.05 (MACRO) 0.50 (PRZM)									default

Compound	Pyra-clostrobin	BF 500-6	BF 500-7	BF 500-3	BF 500-11*	BF 500-13*	BF 500-14*	BF 500-15*	500 M 58*	Value in accordance to EU end-point y/n/ Reference
DT _{50,soil} (d)	34.4 d (Maximum, field studies)	166 d (Maximum, laboratory studies)	159 d (Maximum, laboratory studies)	231 d (Maximum, laboratory studies, anaerobie)	1 d (default) They are not a soil metabolites					Y/Review Report, 2004
DT _{50,water} (d)	1000 (default)	1000								
DT _{50,sed} (d)	33 (Maximum, water/sediment studies)	1000								
DT _{50,whole system} (d)	29 (Maximum, water/sediment studies)	1000								
Maximum occurrence observed (% molar basis with respect to the parent)	Sediment: 62.1	Soil: 31 Water:- Sediment: 6.5 Total system: 6.5	Soil: 13 Water:- Sediment: 6.3 Total system: 6.3	Soil: 95.8 Water: 2.3 Sediment: 65.7 Total system: 68	Soil:0.00001 (default) Water: 44.5 Sediment: 44.5	Soil: 0.00001 (default) Water: 16.8 Sediment: 16.8	Soil: 0.00001 (default) Water: 20.7 Sediment: 20.7	Soil: 0.00001 (default) Water: 26.6 Sediment: 26.6	Soil: 0.00001 (default) Water: 22.7 Sediment: 22.7	Y/Review Report, 2004
Formation fraction in soil:	-	1 from BF 500-3	1 from BF 500-3	1 from parent	-	-	-	-	-	

*Water photolysis metabolites

PEC_{sw/sed}

Table 8.9-18: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Pyraclostrobin following single/multiple applications of CASINO ROYALE to sugar beet

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw,twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	3.52/7.04	-	2.12/4.25	231.25/462.49
Step 2					
Southern Europe	June-Sep	0.92/0.89	Runoff / Drainage	0.26/0.43	24.79/44.76
Northern Europe				0.21/0.34	18.41/32.95
Step 3					
D3	ditch	0.524/0.456	Drift	0.024/0.043	0.347/0.519
D4	pond	0.021/0.031	Drift	0.015/0.023	0.154/0.249
D4	stream	0.422/0.363	Drift	0.001/0.001	0.016/0.019
R1	pond	0.028/0.058	Runoff / erosion	0.023/0.048	0.425/0.794
R1	stream	0.364/0.314	Runoff / erosion	0.008/0.018	4.206/8.940
R3	stream	0.511/0.442	Runoff / erosion	0.012/0.018	1.009/2.256

Table 8.9-19: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Pyraclostrobin following single/multiple applications of CASINO ROYALE to tomato and eggplant (fruiting vegetables and potato, BBCH 12 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw,twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	3.52/10.57	-	2.12/6.37	231.25/693.74
Step 2					
Southern Europe	March-May	0.92/2.05	Runoff / Drainage	0.63/1.66	69.44/175.15
Northern Europe		0.92/1.12		0.37/0.88	37.55/93.00
Step 3					
D3	ditch	0.525/0.382	Drift	0.028/0.042	0.399/0.482
D4	pond	0.021/0.031	Drift	0.015/0.024	0.161/0.306
D4	stream	0.447/0.323	Drift	0.002/0.001	0.028/0.020
D6	ditch	0.624/0.459	Drift	0.011/0.021	0.163/0.286
R1	pond	0.021/0.043	Runoff / erosion	0.018/0.036	0.300/0.561
R1	stream	0.357/0.263	Runoff / erosion	0.008/0.011	1.623/3.341
R2	stream	0.553/0.407	Runoff / erosion	0.005/0.006	2.672/4.719

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
R3	stream	0.589/0.429	Runoff / erosion	0.013/0.019	1.194/4.695
R4	stream	0.418/0.314	Runoff / erosion	0.022/0.051	2.817/5.992

Table 8.9-20: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Pyraclostrobin following single/multiple applications of CASINO ROYALE to carrots, beetroot, celery root, radish, horseradish, swedes, turnip, chicory roots and salsifies (root vegetables, BBCH 11 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw,twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	3.52/7.04	-	2.12/4.25	231.25/462.49
Step 2					
Southern Europe	March-May	0.92/1.50	Runoff / Drainage	0.63/1.21	69.44/127.42
Northern Europe		0.92/0.89		0.37/0.63	37.55/68.38
Step 3					
D3	ditch	0.634/0.555	Drift	0.033/0.059	0.475/0.677
D6	ditch	0.633/0.557	Drift	0.031/0.061	0.442/0.743
R1	Pond	0.025/0.040	Runoff / erosion	0.021/0.034	0.358/0.593
R1	stream	0.418/0.361	Runoff / erosion	0.009/0.012	2.274/3.736
R2 1 st	stream	0.552/0.478	Runoff / erosion	0.005/0.009	3.681/7.613
R2 2 nd	stream	0.562/0.486	Runoff / erosion	0.003/0.005	12.41/26.20
R3	stream	0.587/0.508	Runoff / erosion	0.014/0.013	0.841/1.832
R4	stream	0.413/0.360	Runoff / erosion	0.016/0.036	2.248/5.754

Table 8.9-21: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Pyraclostrobin following single/multiple applications of CASINO ROYALE to onion, shallot, onion “seven years old and ornamentals (bulb vegetables, BBCH 13 as worst case)

Scenario	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw,twa} (µg/L)	Max PEC _{sed} (µg/kg)
FOCUS					
Step 1	---	3.52/7.04		2.12/4.25	231.25/462.49
Step 2					
Southern Europe	March-May	0.97/1.79	Runoff / Drainage	0.78/1.45	82.20/152.44
Northern Europe		0.92/0.98		0.42/0.77	43.93/80.93
Step 3					
D3	ditch	0.643/0.556	Drift	0.034/0.061	0.481/0.710

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
D4	pond	0.022/0.030	Drift	0.016/0.023	0.167/0.265
D4	stream	0.479/0.415	Drift	0.001/0.002	0.016/0.021
D6 1 st	ditch	0.638/0.598	Drift	0.105/0.226	1.154/2.047
D6 2 nd	ditch	0.639/0.558	Drift	0.145/0.127	1.658/1.451
R1	pond	0.023/0.039	Runoff / erosion	0.020/0.030	0.312/0.464
R1	stream	0.411/0.355	Runoff / erosion	0.009/0.012	1.766/2.557
R2	stream	0.553/0.479	Runoff / erosion	0.003/0.006	3.718/8.006
R3	stream	0.587/0.510	Runoff / erosion	0.008/0.017	0.848/1.767
R4	stream	0.415/0.359	Runoff / erosion	0.019/0.042	2.104/4.367

Table 8.9-22: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Pyraclostrobin following single/multiple applications of CASINO ROYALE to cabbage, strawberry, parsnip and parsley (leafy vegetables, BBCH 15 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	3.52/7.04		2.12/4.25	231.25/462.49
Step 2					
Southern Europe	March-May June -Sept	0.92/1.55	Runoff / Drainage	0.63/1.24	69.44/131.05
Northern Europe		0.92/0.90		0.37/0.64	37.55/70.32
Step 3					
D3 1 st	ditch	0.768/0.673	Drift	0.041/0.073	0.582/0.880
D3 2 nd	ditch	0.764/0.669	Drift	0.026/0.046	0.380/0.608
D4	pond	0.026/0.036	Drift	0.019/0.027	0.193/0.307
D4	stream	0.571/0.505	Drift	0.001/0.002	0.017/0.026
D6	ditch	0.757/0.668	Drift	0.014/0.035	0.214/0.442
R1 1 st	pond	0.028/0.049	Runoff / erosion	0.024/0.039	0.547/1.030
R1 2 nd	pond	0.030/0.059	Runoff / erosion	0.023/0.047	0.674/1.375
R1 1 st	stream	0.500/0.433	Runoff / erosion	0.012/0.015	7.909/17.20
R1 2 nd	stream	0.507/0.439	Runoff / erosion	0.005/0.010	4.860/9.777
R21st	stream	0.670/0.579	Runoff / erosion	0.003/0.006	1.253/2.718
R2 2 nd	stream	0.680/0.588	Runoff / erosion	0.003/0.006	6.191/13.69
R3 1 st	stream	0.715/0.618	Runoff / erosion	0.017/0.031	4.545/9.092
R3 2 nd	stream	0.715/0.619	Runoff / erosion	0.022/0.038	2.122/4.275
R4 1 st	stream	0.507/0.438	Runoff / erosion	0.019/0.044	2.379/4.829
R4 2 nd	stream	0.505/0.439	Runoff / erosion	0.019/0.039	1.336/3.089

Table 8.9-23: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Pyraclostrobin following single/multiple applications of CASINO ROYALE to cherry (apple early application as worst case, BBCH 60)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw,twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	8.26/16.53		1.91/3.83	194.80/389.59
Step 2					
Southern Europe	March-May	6.52/6.32	Runoff / Drainage	0.90/1.34	60.83/106.20
Northern Europe				0.82/1.18	51.07/87.61
Step 3					
D3	ditch	5.221/4.153	Drift	0.418/0.731	5.487/7.855
D4	pond	0.317/0.501	Drift	0.239/0.389	2.351/4.072
D4	stream	5.534/4.733	Drift	0.071/0.125	1.121/1.651
D5	pond	0.317/0.474	Drift	0.242/0.377	2.445/4.132
D5	stream	5.977/5.107	Drift	0.105/0.182	1.636/2.136
R1	pond	0.316/0.468	Runoff / erosion	0.232/0.356	2.200/3.784
R1	stream	4.241/3.620	Runoff / erosion	0.044/0.060	0.952/1.192
R2	stream	5.684/4.853	Runoff / erosion	0.029/0.049	0.463/0.676
R3	stream	5.935/5.103	Runoff / erosion	0.080/0.158	1.260/1.905
R4	stream	4.145/3.620	Runoff / erosion	0.023/0.056	0.379/0.706

Apple has been chosen as surrogate crop for D3 and D4 scenarios. The drift values used are the same than for vines and have been modified manually.

Table 8.9-24: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Pyraclostrobin following single/multiple applications of CASINO ROYALE to raspberry, blackcurrant, ornamentals, redcurrant and white currant (vines and apple late application as worst case, BBCH 61)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw,twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	6.39/12.77		2.75/5.49	294.15/588.31
Step 2					
Southern Europe	June-Sept	3.24/3.17	Runoff / Drainage	0.62/0.98	50.77/90.97
Northern Europe				0.53/0.82	40.66/71.80
Step 3					
D3	ditch	2.067/1.836	Drift	0.165/0.297	2.181/3.226
D4	pond	0.074/0.117	Drift	0.056/0.090	0.561/0.969

Scenario FOCUS	Waterbody	Max PEC_{sw} (µg/L)	Dominant entry route	21d PEC_{sw, twa} (µg/L)	Max PEC_{sed} (µg/kg)
D4	stream	1.988/1.757	Drift	0.025/0.046	0.403/0.617
D6	ditch	2.064/1.861	Drift	0.192/0.580	2.283/6.318
R1	pond	0.074/0.103	Runoff / erosion	0.055/0.083	0.575/1.003
R1	stream	1.519/1.340	Runoff / erosion	0.017/0.027	0.766/1.863
R2	stream	2.042/1.801	Runoff / erosion	0.010/0.018	0.167/0.240
R3	stream	2.139/1.894	Runoff / erosion	0.032/0.033	0.504/0.570
R4	stream	1.523/1.344	Runoff / erosion	0.015/0.013	0.240/0.249

FOCUS Step 4

Table 8.9-25: Global maximum PEC_{sw} values for Pyraclostrobin, following single/multiple applications of CASINO ROYALE to sugar beet according to the Central EU zone GAP and to surface water Step 4

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
None	D3 ditch	0.172/0.144	0.091/0.075	0.062/0.050	0.047/-	-/-	-/-	-/-	-/-
50 %		0.086/0.072	0.046/0.037	0.031/-	-/-	-/-	-/-	-/-	-/-
75 %		0.043/0.036	-/-	-/-	-/-	-/-	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	D4 stream	0.178/0.149	0.094/0.077	0.064/0.052	0.049/-	-/-	-/-	-/-	-/-
50 %		0.089/0.074	0.047/0.039	-/-	-/-	-/-	-/-	-/-	-/-
75 %		0.044/0.037	-/-	-/-	-/-	-/-	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	R1 stream	0.153/-	0.081/-	0.079/-	0.079/-	0.153/0.128	0.081/0.067	0.055/0.052	0.042/0.035
50 %		0.079/-	0.079/-	-/-	-/-	0.077/0.096	0.041/0.067	-/-	-/-
75 %		0.079/-	0.079/-	-/-	-/-	0.052/0.096	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	R3 stream	0.215/-	0.114/-	0.085/-	0.085/-	0.215/0.181	0.114/0.094	0.078/0.063	0.059/0.048
50 %		0.108/-	0.085/-	-/-	-/-	0.108/0.090	0.057/0.050	0.039/0.038	-/-
75 %		0.085/-	0.085/-	-/-	-/-	0.055/0.071	-/-	-/-	-/-
90 %		0.085/-	-/-	-/-	-/-	-/0.071	-/-	-/-	-/-

*The value used for reduction in run-off volume, run-off flux, erosion mass and erosion flux was 0.4, according to the Austrian Environmental Agency AGES.

**The values used for reduction in run-off volume and run-off flux was 0.7, and for erosion mass and erosion flux was 0.9, according to the Austrian Environmental Agency AGES.

Table 8.9-26: Global maximum PEC_{sw} values for Pyraclostrobin, following single/multiple applications of CASINO ROYALE to tomato and eggplant (fruiting vegetables and potato, BBCH 12 as worst case) according to the Central EU zone GAP and to surface water Step 4

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
None	D3 ditch	0.172/0.123	0.091/0.064	0.062/0.044	0.047/-	-/-	-/-	-/-	-/-
50 %		0.086/0.0606	0.046/0.032	0.031/-	-/-	-/-	-/-	-/-	-/-
75 %		0.043/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	D4 stream	0.188/0.134	0.100/0.070	0.068/0.048	0.052/-	-/-	-/-	-/-	-/-
50 %		0.094/0.067	0.050/0.035	0.034/-	-/-	-/-	-/-	-/-	-/-
75 %		0.047/0.033	-/-	-/-	-/-	-/-	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	D6 ditch	0.169/0.122	0.090/0.064	0.0613/0.043	-/-	-/-	-/-	-/-	-/-
50 %		0.085/0.0607	0.045/0.032	-/-	-/-	-/-	-/-	-/-	-/-
75 %		0.042/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	R1 stream	0.150/-	0.092/-	0.092/-	-/-	0.150/0.130	0.080/0.091	0.054/0.071	0.041/

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
50 %		0.092/-	0.092/-	-/-	-/-	0.075/0.130	0.042/-	-/-	-/-
75 %		0.092/	-/-	-/-	-/-	0.060/-	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	R2 stream	0.202/0.146	0.107/0.077	0.073/0.059	0.056/-	-/	-/	-/	-/
50 %		0.101/0.073	0.053/0.059	0.037/-	-/-	-/	-/	-/	-/
75 %		0.051/0.059	-/-	-/-	-/-	-/	-/	-/	-/
90 %		-/-	-/-	-/-	-/-	-/	-/	-/	-/
None	R3 stream	0.215/-	0.114/-	0.098/-	-/-	0.215/0.154	0.114/0.083	0.078/0.064	0.059/0.044
50 %		0.108/-	0.098/-	-/-	-/-	0.108/0.120	0.057/0.083	0.039/-	-/-
75 %		0.098/-	0.098/-	-/-	-/-	0.064/0.120	-/-	-/-	-/-
90 %		0.098/-	-/-	-/-	-/-	0.064/-	-/-	-/-	-/-
None	R4 stream	0.173/-	0.173/-	-/-	-/-	0.153/0.204	0.081/0.142	0.0605/0.109	0.042/0.074
50 %		0.173/-	-/-	-/-	-/-	0.113/0.204	0.079/0.142	-/-	-/-
75 %		-/-	-/-	-/-	-/-	0.113/-	0.079/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-

*The value used for reduction in run-off volume, run-off flux, erosion mass and erosion flux was 0.4, according to the Austrian Environmental Agency AGES.

**The values used for reduction in run-off volume and run-off flux was 0.7, and for erosion mass and erosion flux was 0.9, according to the Austrian Environmental Agency AGES.

Table 8.9-27: Global maximum PEC_{sw} values for Pyraclostrobin, following single/multiple applications of CASINO ROYALE to carrots, beet-root, celery root, radish, horseradish, swedes, turnip, chicory roots and salsifies (root vegetables, BBCH 11 as worst case) according to the Central EU zone GAP and to surface water Step 4

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
None	D3ditch	0.172/0.144	0.091/0.075	0.062/0.050	0.047/-	-/-	-/-	-/-	-/-
50 %		0.086/0.072	0.046/0.037	0.031/-	-/-	-/-	-/-	-/-	-/-
75 %		0.043/0.036	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	D6 ditch	0.172/0.144	0.091/0.075	0.062/0.051	0.047/-	-/-	-/-	-/-	-/-
50 %		0.086/0.072	0.046/0.038	0.031/-	-/-	-/-	-/-	-/-	-/-
75 %		0.043/0.036	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	R1 stream	0.153/-	0.093/-	0.093/-	-/-	0.153/0.128	0.091/0.077	0.055/0.059	0.042/-
50 %		0.093/-	0.093/-	-/-	-/-	0.076/0.111	0.042/0.077	-/-	-/-
75 %		0.093/-	-/-	-/-	-/-	0.061/0.111	-/-	-/-	-/-
None	R2 1 st stream	0.202/0.169	0.107/0.088	0.073/0.062	0.056/0.062	-/0.169	-/0.088	-/0.059	-/0.045
50 %		0.101/0.084	0.054/0.062	0.037/0.062	-/-	-/0.084	-/0.044	-/-	-/-
75 %		0.050/0.062	-/0.062	-/-	-/-	-/0.042	-/-	-/-	-/-
None	R2 2 nd stream	0.205/0.172	0.109/0.089	0.074/0.0602	0.057/-	-/-	-/-	-/-	-/-
50 %		0.103/0.086	0.054/0.045	0.037/-	-/-	-/-	-/-	-/-	-/-
75 %		0.051/0.043	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	R3 stream	0.215/-	0.114/-	0.105/-	-/-	0.215/0.179	0.114/0.093	0.078/0.063	0.059/0.047
50 %		0.107/-	0.105/-	-/-	-/-	0.107/0.097	0.057/0.068	0.039/0.052	-/-

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
75 %		0.105/	-/-	-/-	-/-	0.068/0.097	-/0.068	-/-	-/-
None	R4 stream	0.167/	0.167/-	-/-	-/-	0.151/0.180	0.080/0.125	0.058/0.096	0.042/0.066
50 %		0.167/	-/-	-/-	-/-	0.109/0.180	0.076/0.125	-/0.096	-/0.066
75 %		-/-	-/-	-/-	-/-	0.109/-	0.076/-	-/-	-/-

*The value used for reduction in run-off volume, run-off flux, erosion mass and erosion flux was 0.4, according to the Austrian Environmental Agency AGES.

**The values used for reduction in run-off volume and run-off flux was 0.7, and for erosion mass and erosion flux was 0.9, according to the Austrian Environmental Agency AGES.

Table 8.9-28: Global maximum PEC_{sw} values for Pyraclostrobin, following single/multiple applications of CASINO ROYALE to onion, shallot, onion “seven years old and ornamentals (bulb vegetables, BBCH 13 as worst case) according to the Central EU zone GAP and to surface water Step 4

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
None	D3 ditch	0.172/0.144	0.091/0.075	0.062/0.051	0.047/-	-/-	-/-	-/-	-/-
50 %		0.086/0.072	0.046/0.037	0.031/-	-/-	-/-	-/-	-/-	-/-
75 %		0.043/0.036	-/-	-/-	-/-	-/-	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	D4 stream	0.175/0.146	0.093/0.076	0.063/0.051	0.048/-	-/-	-/-	-/-	-/-

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
50 %		0.088/0.073	0.046/0.038	0.032/-	-/-	-/-	-/-	-/-	-/-
75 %		0.044/0.037	-/-	-/-	-/-	-/-	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	D6 1 st ditch	0.173/0.155	0.092/0.080	0.063/0.054	0.048/-	-/-	-/-	-/-	-/-
50 %		0.086/0.077	0.046/0.040	0.031/-	-/-	-/-	-/-	-/-	-/-
75 %		0.043/0.039	-/-	-/-	-/-	-/-	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	D6 2 nd ditch	0.173/0.145	0.092/0.075	0.063/0.051	0.048/-	-/-	-/-	-/-	-/-
50 %		0.087/0.072	0.046/0.038	0.031/-	-/-	-/-	-/-	-/-	-/-
75 %		0.043/0.036	-/-	-/-	-/-	-/-	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	R1 stream	0.150/	0.092/	0.092/-	-/-	0.150/0.126	0.080/0.065	0.054/0.049	0.041/-
50 %		0.092/	0.092/	-/-	-/-	0.075/0.092	0.042/0.064	-/-	-/-
75 %		0.092/	-/-	-/-	-/-	0.0601/0.092	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	R2 stream	0.202/0.169	0.107/0.087	0.073/0.059	0.056/-	-/-	-/-	-/-	-/-
50 %		0.101/0.085	0.054/0.048	0.037/-	-/-	-/-	-/-	-/-	-/-
75 %		0.051/0.048	-/-	-/-	-/-	-/-	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	R3 stream	0.214/	0.114/-	0.085/-	0.085/-	0.214/0.180	0.114/0.093	0.078/0.063	0.059/0.048

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
50 %	R4 stream	0.107/-	0.085/-	0.085/-	-/-	0.107/0.119	0.057/0.048	0.039/0.063	-/-
75 %		0.085/-	0.085/-	-/-	-/-	0.055/0.119	-/-	-/-	-/-
90 %		0.085/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None		0.156/-	0.156/-	-/-	-/-	0.152/0.206	0.088/0.143	0.055/0.110	0.042/0.075
50 %	R4 stream	0.156/-	-/-	-/-	-/-	0.101/0.206	0.071/0.143	-/-	-/-
75 %		-/-	-/-	-/-	-/-	0.101/-	0.071/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-

*The value used for reduction in run-off volume, run-off flux, erosion mass and erosion flux was 0.4, according to the Austrian Environmental Agency AGES.

**The values used for reduction in run-off volume and run-off flux was 0.7, and for erosion mass and erosion flux was 0.9, according to the Austrian Environmental Agency AGES.

Table 8.9-29: Global maximum PEC_{sw} values for Pyraclostrobin, following single/multiple applications of CASINO ROYALE to cabbage, strawberry, parsnip and parsley (leafy vegetables, BBCH 15 as worst case) according to the Central EU zone GAP and to surface water Step 4

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
None	D3 1 st ditch	0.208/0.175	0.110/0.091	0.075/0.0611	0.057/-	-/-	-/-	-/-	-/-
50 %		0.104/0.087	0.055/0.045	0.038/-	-/-	-/-	-/-	-/-	-/-

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
75 %	D3 2 nd ditch	0.051/0.044	-/-	-/-	-/-	-/-	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None		0.207/0.174	0.110/0.090	0.075/0.0608	0.057/-	-/-	-/-	-/-	-/-
50 %		0.104/0.087	0.055/0.045	0.038/-	-/-	-/-	-/-	-/-	-/-
75 %	D4 stream	0.052/0.043	-/-	-/-	-/-	-/-	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None		0.209/0.179	0.111/0.093	0.076/0.063	0.057/0.047	-/-	-/-	-/-	-/-
50 %		0.104/0.089	0.055/0.046	0.038/0.031	-/-	-/-	-/-	-/-	-/-
75 %	D6 ditch	0.052/0.045	-/-	-/-	-/-	-/-	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None		0.205/0.173	0.109/0.090	0.074/0.0607	0.057/-	-/-	-/-	-/-	-/-
50 %		0.103/0.087	0.054/0.045	0.037/-	-/-	-/-	-/-	-/-	-/-
75 %	R1 1 st stream	0.051/0.43	-/-	-/-	-/-	-/-	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None		0.183/-	0.102/-	0.102/-	-/-	0.183/0.153	0.097/0.079	0.066/0.054	0.050/0.040
50 %		0.102/-	0.102/-	-/-	-/-	0.091/0.099	0.048/0.069	0.035/-	-/-
75 %	R1 2 nd stream	0.102/-	-/-	-/-	-/-	0.066/0.099	-/0.069	-/-	-/-
90 %		-/-	-/-	-/-	-/-	0.066/-	-/-	-/-	-/-
None		0.185/-	0.098/-	0.067/-	0.066/-	0.185/0.155	0.098/0.081	0.067/0.054	0.051/0.041
50 %		0.093/-	0.066/-	0.066/-	0.066/-	0.093/0.096	0.049/0.067	0.034/-	-/-

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
75 %	R2 1 st stream	0.066/-	0.066/-	-/-	-/-	0.046/0.096	-/0.067	-/-	-/-
90 %		0.066/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None		0.245/0.205	0.130/0.106	0.089/0.072	0.067/0.054	-/-	-/-	-/-	-/-
50 %		0.122/0.102	0.065/0.053	0.044/0.048	0.034/-	-/-	-/-	-/-	-/-
75 %	R2 2 nd stream	0.0612/0.051	0.032/-	-/-	-/-	-/-	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None		0.249/0.208	0.132/0.108	0.090/0.073	0.068/0.055	-/-	-/-	-/-	-/-
50 %		0.124/0.104	0.066/0.054	0.045/0.036	0.034/-	-/-	-/-	-/-	-/-
75 %	R3 1 st stream	0.062/0.052	0.033/-	-/-	-/-	-/-	-/-	-/-	-/-
90 %		0.025/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None		0.261/-	0.139/-	0.099/-	0.099/-	0.261/0.219	0.139/0.114	0.095/0.077	0.072/0.058
50 %		0.131/-	0.099/-	0.099/-	-/-	0.131/0.133	0.069/0.093	0.047/0.071	0.036/-
75 %	R3 2 nd stream	0.099/-	0.099/-	-/-	-/-	0.065/0.133	0.045/0.093	-/-	-/-
90 %		0.099/-	-/-	-/-	-/-	0.065/-	-/-	-/-	-/-
None		0.261/-	0.139/-	0.095/-	0.092/-	0.261/0.219	0.139/0.114	0.095/0.077	0.072/0.058
50 %		0.131/-	0.092/-	0.092/-	-/-	0.131/0.112	0.069/0.078	0.047/0.060	0.036/-
75 %	R4 1 st stream	0.092/-	0.092/-	-/-	-/-	0.065/0.112	0.042/0.078	-/-	-/-
90 %		0.092/-	-/-	-/-	-/-	0.060/-	-/-	-/-	-/-
None	R4 1 st stream	0.185/-	0.164/-	0.164/-	-/-	0.185/0.236	0.098/0.164	0.067/0.126	0.051/0.086
50 %		0.164/-	0.164/-	-/-	-/-	0.107/0.236	0.075/0.164	0.057/-	-/-

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
75 %	R4 2 nd stream	0.164/-	-/-	-/-	-/-	0.107/-	0.075/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
None		0.184/-	0.157/-	0.157/-	-/-	0.184/0.196	0.098/0.137	0.067/0.105	0.051/0.072
50 %		0.157/-	0.157/-	-/-	-/-	0.103/0.196	0.072/0.137	0.055/-	-/-
75 %		0.157/-	-/-	-/-	-/-	0.103/-	0.072/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-

*The value used for reduction in run-off volume, run-off flux, erosion mass and erosion flux was 0.4, according to the Austrian Environmental Agency AGES.

**The values used for reduction in run-off volume and run-off flux was 0.7, and for erosion mass and erosion flux was 0.9, according to the Austrian Environmental Agency AGES.

Table 8.9-30: Global maximum PEC_{sw} values for Pyraclostrobin, following single/multiple applications of CASINO ROYALE to cherry (apple early application as worst case, BBCH 60) according to the Central EU zone GAP and to surface water Step 4

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin						
Nozzle reduction	Vegetative strip (m)	None						
	No spray buffer (m)	5	10	15	20	30	40	50
None	D3 ditch	4.101/3.479	2.519/2.055	1.133/1.128	0.576/0.532	0.220/0.182	0.111/0.085	0.065/0.047
50 %		2.051/1.739	1.260/1.028	0.567/0.564	0.288/0.266	0.110/0.091	0.055/0.043	0.033/-
75 %		1.026/0.870	0.630/0.514	0.283/0.282	0.144/0.133	0.055/0.046	-/-	-/-
90 %		0.410/0.348	0.252/0.206	0.113/0.113	0.058/0.059	-/-	-/-	-/-
None	D4 pond	0.356/0.562	0.195/0.319	0.103/0.167	0.063/0.096	0.031/0.043	-/-	-/-
50 %		0.178/0.281	0.098/0.159	0.052/0.084	0.032/0.048	-/-	-/-	-/-
75 %		0.089/0.140	0.049/0.080	-/0.042	-/-	-/-	-/-	-/-
90 %		0.036/0.056	-/0.032	-/-	-/-	-/-	-/-	-/-
None	D4 stream	4.755/4.019	2.920/2.374	1.314/1.303	0.668/0.615	0.255/0.211	0.129/0.099	0.075/0.054
50 %		2.377/2.009	1.460/1.187	0.657/0.652	0.334/0.307	0.128/0.106	0.064/0.049	0.038/-
75 %		1.189/1.005	0.730/0.594	0.329/0.326	0.167/0.154	0.064/0.053	0.032/-	-/-
90 %		0.476/0.402	0.292/0.237	0.131/0.130	0.067/0.0615	0.026/-	-/-	-/-
None	D5 pond	0.356/0.532	0.195/0.302	0.103/0.159	0.063/0.091	0.031/0.040	-/-	-/-
50 %		0.178/0.266	0.098/0.151	0.052/0.079	0.032/0.045	-/-	-/-	-/-
75 %		0.089/0.133	0.049/0.075	-/0.040	-/-	-/-	-/-	-/-
90 %		0.036/0.053	-/0.030	-/-	-/-	-/-	-/-	-/-
None	D5 stream	5.135/4.337	3.153/2.561	1.419/1.406	0.721/0.663	0.276/0.228	0.139/0.106	0.081/0.059

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin						
Nozzle reduction	Vegetative strip (m)	None						
	No spray buffer (m)	5	10	15	20	30	40	50
50 %	R1 pond	2.567/2.168	1.577/1.281	0.709/0.703	0.361/0.332	0.138/0.114	0.069/0.053	0.041/-
75 %		1.284/1.084	0.788/0.641	0.355/0.352	0.180/0.166	0.069/0.057	0.035/-	-/-
90 %		0.514/0.434	0.315/0.256	0.142/0.141	0.072/0.066	0.028/-	-/-	-/-
None		0.356/0.525	0.195/0.300	0.103/0.159	0.063/0.093	0.031/0.043	-/-	-/-
50 %	R1 stream	0.178/0.264	0.098/0.151	0.052/0.082	0.032/0.048	-/-	-/-	-/-
75 %		0.089/0.134	0.049/0.077	-/0.042	-/-	-/-	-/-	-/-
90 %		0.036/0.055	-/0.033	-/-	-/-	-/-	-/-	-/-
None	R2 stream	3.644/3.074	2.237/1.816	1.007/0.997	0.512/0.470	0.196/0.162	0.099/0.075	0.058/0.054
50 %		1.822/1.537	1.119/0.908	0.503/0.498	0.256/0.235	0.098/0.081	0.052/0.054	-/-
75 %		0.911/0.768	0.559/0.454	0.252/0.249	0.128/0.118	0.052/0.054	-/-	-/-
90 %		0.364/0.307	0.224/0.182	0.101/0.100	0.052/0.054	-/-	-/-	-/-
None	R3 stream	4.884/4.121	2.999/2.434	1.349/1.336	0.686/0.630	0.262/0.217	0.132/0.101	0.077/0.056
50 %		2.442/2.060	1.500/1.217	0.674/0.668	0.343/0.315	0.131/0.108	0.066/0.051	0.039-
75 %		1.221/1.030	0.750/0.609	0.337/0.334	0.171/0.158	0.066/0.054	0.033/-	-/-
90 %		0.488/0.412	0.300/0.243	0.135/0.134	0.069/0.063	0.026/-	-/-	-/-
None	R4 stream	5.099/4.334	3.131/2.560	1.409/1.405	0.716/0.663	0.274/0.228	0.138/0.106	0.081/0.059
50 %		2.549/2.166	1.566/1.280	0.704/0.702	0.358/0.331	0.137/0.114	0.069/0.053	0.040/-
75 %		1.275/1.083	0.783/0.640	0.352/0.351	0.179/0.166	0.068/0.057	0.034/-	-/-
90 %		0.510/0.433	0.313/0.256	0.141/0.141	0.072/0.066	0.027/-	-/-	-/-
None	R4 stream	3.561/3.074	2.187/1.185	0.984/0.996	0.500/0.470	0.191/0.162	0.096/0.078	0.056/0.078

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin						
Nozzle reduction	Vegetative strip (m)	None						
	No spray buffer (m)	5	10	15	20	30	40	50
50 %		1.780/1.536	1.094/0.908	0.492/0.498	0.250/0.235	0.096/0.081	0.048/0.078	-/-
75 %		0.890/0.768	0.547/0.454	0.246/0.249	0.125/0.118	0.048/0.078	-/-	-/-
90 %		0.356/0.307	0.219/0.182	0.098/0.100	0.050/0.078	-/0.078	-/-	-/-

Table 8.9-31: Global maximum PEC_{sw} values for Pyraclostrobin, following single/multiple applications of CASINO ROYALE to raspberry, blackcurrant, ornamentals, redcurrant and white currant (vines late application as worst case, BBCH 61) according to the Central EU zone GAP and to surface water Step 4

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin						
Nozzle reduction	Vegetative strip (m)	None						
	No spray buffer (m)	5	10	15	20	30	40	50
None	D3 ditch	1.250/1.105	0.453/0.397	0.273/0.239	0.159/0.138	0.085/0.074	0.055/0.047	-/-
50 %		0.625/0.553	0.226/0.198	0.137/0.119	0.079/0.069	0.043/0.037	-/-	-/-
75 %		0.313/0.276	0.113/0.099	0.068/0.060	0.040/0.035	-/-	-/-	-/-
90 %		0.125/0.111	0.045/0.040	0.027/-	-/-	-/-	-/-	-/-
None	D4 pond	0.086/0.136	0.047/0.074	-/0.054	-/-	-/-	-/-	-/-
50 %		0.048/0.068	-/0.037	-/-	-/-	-/-	-/-	-/-
75 %		-/0.034	-/-	-/-	-/-	-/-	-/-	-/-

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin						
Nozzle reduction	Vegetative strip (m)	None						
	No spray buffer (m)	5	10	15	20	30	40	50
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	D4 stream	1.207/1.064	0.437/0.382	0.264/0.230	0.153/0.133	0.082/0.071	0.053/0.045	-/-
50 %		0.604/0.532	0.219/0.191	0.132/0.115	0.077/0.066	0.041/0.035	-/-	-/-
75 %		0.302/0.266	0.109/0.096	0.066/0.057	0.038/0.033	-/-	-/-	-/-
90 %		0.121/0.106	0.044/0.038	0.026/-	-/-	-/-	-/-	-/-
None	D6 ditch	1.248/1.120	0.452/0.402	0.246/0.217	0.158/0.140	0.085/0.075	0.055/0.048	-/-
50 %		0.624/0.560	0.226/0.201	0.123/0.109	0.079/0.070	0.043/0.036	-/-	-/-
75 %		0.312/0.280	0.113/0.101	0.0614/0.054	0.040/0.035	-/-	-/-	-/-
90 %		0.125/0.112	0.045/0.040	-/-	-/-	-/-	-/-	-/-
None	R1 pond	0.086/0.119	0.047/0.066	-/0.045	-/-	-/-	-/-	-/-
50 %		0.043/0.060	-/0.036	-/-	-/-	-/-	-/-	-/-
75 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-
90 %		-/-	-/-	-/-	-/-	-/-	-/-	-/-
None	R1 stream	1.107/0.973	0.401/0.350	0.218/0.189	0.141/0.166	0.081/0.166	0.081/-	-/-
50 %		0.553/0.487	0.200/0.175	0.109/0.166	0.081/0.166	0.081/-	-/-	-/-
75 %		0.277/0.244	0.100/0.166	0.081/0.166	0.081/-	-/-	-/-	-/-
90 %		0.111/0.166	0.081/0.166	0.081/-	-/-	-/-	-/-	-/-
None	R2 stream	1.488/1.309	0.539/0.470	0.293/0.254	0.189/0.164	0.102/0.087	0.065/0.056	0.046/-
50 %		0.744/0.655	0.269/0.235	0.146/0.127	0.095/0.082	0.051/0.044	0.033/-	-/-
75 %		0.372/0.327	0.135/0.118	0.073/0.064	0.047/0.041	-/-	-/-	-/-

PEC _{sw} (µg/L)	Scenario	STEP 4 Pyraclostrobin						
Nozzle reduction	Vegetative strip (m)	None						
	No spray buffer (m)	5	10	15	20	30	40	50
90 %		0.149/0.131	0.054/0.047	0.029/0.025	-/-	-/-	-/-	-/-
None	R3 stream	1.558/1.376	0.564/0.495	0.307/0.267	0.198/0.172	0.106/0.092	0.068/0.059	0.048/
50 %		0.779/0.688	0.282/0.247	0.153/0.134	0.099/0.086	0.053/0.046	0.034/-	-/-
75 %		0.389/0.344	0.141/0.124	0.077/0.067	0.049/0.045	-/-	-/-	-/-
90 %		0.156/0.138	0.056/0.049	0.031/0.045	-/-	-/-	-/-	-/-
None	R4 stream	1.110/0.976	0.402/0.351	0.218/0.190	0.141/0.122	0.076/0.074	0.049/0.074	-/-
50 %		0.555/0.488	0.201/0.175	0.109/0.095	0.070/0.074	0.038/0.074	-/-	-/-
75 %		0.277/0.244	0.101/0.088	0.055/0.074	0.035/0.074	-/-	-/-	-/-
90 %		0.111/0.098	0.040/0.074	-/0.074	-/-	-/-	-/-	-/-

Metabolites of Pyraclostrobin

Simulations were done only for Southern Europe zone since it is the worst case.

Table 8.9-32: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-6 following single/multiple applications to sugar beet

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	0.63/1.26	-	0.54/1.07	144.40/288.80
Step 2					
Southern Europe	June-Sept	0.09/0.10	Run off/Drainage	0.05/0.09	13.27/25.72

Table 8.9-33: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-6 following single/multiple applications to tomato and eggplant (fruiting vegetables, BBCH 12 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	0.63/1.89	-	0.54/1.61	144.40/433.21
Step 2					
Southern Europe	March-May	0.16/0.45	Run off/Drainage	0.16/0.45	42.64/121.05

Table 8.9-34: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-6 following single/multiple applications to carrots, beetroot, celery root, radish, horseradish, swedes, turnip, chicory roots and salsifies (root vegetables, BBCH 11 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	0.63/1.26	-	0.54/1.07	144.40/288.80
Step 2					
Southern Europe	March-May	0.16/0.31	Run off/Drainage	0.16/0.31	42.64/82.96

Table 8.9-35: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-6 following single/multiple applications to onion, shallot, onion “seven years old and ornamentals (bulb vegetables, BBCH 13 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	0.63/1.26	-	0.54/1.07	144.40/288.80
Step 2					

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Southern Europe	June-Sept	0.19/0.37	Run off/Drainage	0.19/0.37	51.04/99.62

Table 8.9-36: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-6 following single/multiple applications of CASINO ROYALE to cabbage, strawberry, parsnip and parsley (leafy vegetables, BBCH 15 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	0.63/1.26	-	0.54/1.07	144.40/288.80
Step 2					
Southern Europe	March-May	0.16/0.31	Run off/Drainage	0.16/0.31	42.64/83.75

Table 8.9-37: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-6 following single/multiple applications of CASINO ROYALE to cherry (apple early application as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	0.70/1.41		0.05/0.11	103.69/207.38
Step 2					
Southern Europe	March-May	0.67/0.59	Runoff / Drainage	0.04/0.04	18.42/35.14

Table 8.9-38: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-6 following single/multiple applications of CASINO ROYALE to raspberry, blackcurrant, ornamentals, redcurrant and white currant (vines late application as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	1.03/2.05		0.39/0.78	101.16/202.32
Step 2					
Southern Europe	June-Sept	0.67/0.61	Runoff / Drainage	0.09/0.14	17.97/34.28

Table 8.9-39: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-7 following single/multiple applications to sugar beet

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	0.30/0.61	-	0.22/0.43	73.08/146.16
Step 2					
Southern Europe	June-Sept	0.09/0.08	Run off/Drainage	0.02/0.04	6.93/13.26

Table 8.9-40: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-7 following single/multiple applications to tomato and eggplant (fruiting vegetables, BBCH 12 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	0.30/0.91	-	0.22/0.65	73.08/219.24
Step 2					
Southern Europe	March-May	0.09/0.18	Run off/Drainage	0.06/0.18	21.58/59.98

Table 8.9-41: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-7 following single/multiple applications to carrots, beetroot, celery root, radish, horseradish, swedes, turnip, chicory roots and salsifies (root vegetables, BBCH 11 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	0.30/0.61	-	0.22/0.43	73.08/146.16
Step 2					
Southern Europe	March-May	0.09/0.13	Run off/Drainage	0.06/0.12	21.58/41.54

Table 8.9-42: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-7 following single/multiple applications to onion, shallot, onion “seven years old and ornamentals (bulb vegetables, BBCH 13 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	0.30/0.61	-	0.22/0.43	73.08/146.16
Step 2					
Southern Europe	June-Sept	0.09/0.15	Run off/Drainage	0.07/0.15	25.77/49.83

Table 8.9-43: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-7 following single/multiple applications of CASINO ROYALE to cabbage, strawberry, parsnip and parsley (leafy vegetables, BBCH 15 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	0.30/0.61	-	0.22/0.43	73.08/146.16
Step 2					
Southern Europe	March-May	0.09/0.13	Run off/Drainage	0.06/0.12	21.58/42.07

Table 8.9-44: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-7 following single/multiple applications of CASINO ROYALE to cherry (apple early application as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	0.77/1.55		0.17/0.34	53.15/106.30
Step 2					
Southern Europe	March-May	0.63/0.57	Runoff / Drainage	0.06/0.08	11.16/20.84

Table 8.9-45: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-7 following single/multiple applications of CASINO ROYALE to raspberry, blackcurrant, ornamentals, redcurrant and white currant (vines late application as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	0.57/1.15		0.27/0.54	89.94/179.87
Step 2					
Southern Europe	June-Sept	0.31/0.29	Runoff / Drainage	0.05/0.07	12.42/23.68

Table 8.9-46: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-3 following single/multiple applications to sugar beet

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	4.55/9.10	-	4.00/8.01	351.74/703.48
Step 2					
Southern Europe	June-Sept	0.558/0.78	Run off/Drainage	0.36/0.74	34.05/64.93

Table 8.9-47: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-3 following single/multiple applications to tomato and eggplant (fruiting vegetables, BBCH 12 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	4.55/13.65	-	4.00/12.01	351.74/1060
Step 2					
Southern Europe	March-May	1.22/3.34	Run off/Drainage	1.158/3.27	104.22/288.21

Table 8.9-48: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-3 following single/multiple applications to carrots, beetroot, celery root, radish, horseradish, swedes, turnip, chicory roots and salsifies (root vegetables, BBCH 11 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	4.55/9.10	-	4.00/8.01	351.74/703.48
Step 2					
Southern Europe	March-May	1.22/2.33	Run off/Drainage	1.18/2.27	104.22/200.11

Table 8.9-49: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-3 following single/multiple applications to onion, shallot, onion “seven years old and ornamentals (bulb vegetables, BBCH 13 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	4.55/9.10	-	4.00/8.01	351.74/703.48
Step 2					
Southern Europe	June-Sept	1.44/2.78	Run off/Drainage	1.41/2.72	124.27/239.78

Table 8.9-50: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-3 following single/multiple applications of CASINO ROYALE to cabbage, strawberry, parsnip and parsley (leafy vegetables, BBCH 15 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	4.55/9.10	-	4.00/8.01	351.74/703.48
Step 2					
Southern Europe	March-May	1.22/2.36	Runoff / Drainage	1.18/2.30	104.22/202.77

Table 8.9-51: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-3 following single/multiple applications of CASINO ROYALE to cherry (apple early application as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	6.75/13.51		3.05/6.11	261.24/522.48
Step 2					
Southern Europe	March-May	4.09/3.99	Runoff / Drainage	0.81/1.33	59.51/110.38

Table 8.9-52: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-3 following single/multiple applications of CASINO ROYALE to raspberry, blackcurrant, ornamentals, redcurrant and white currant (vines late application as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	6.84/13.68		4.98/9.95	434.81/869.62
Step 2					
Southern Europe	June-Sept	2.03/2.01	Runoff / Drainage	0.71/1.27	62.50/118.83

Table 8.9-53: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-11 following single/multiple applications to sugar beet

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	10.88/21.77	-	10.81/21.61	0.11/0.22
Step 2					
Southern Europe	June-Sept	1.17/2.14	Run off/Drainage	1.16/2.13	0.01/0.02

Table 8.9-54: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-11 following single/multiple applications to tomato and eggplant (fruiting vegetables, BBCH 12 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	10.88/32.65	-	10.81/32.42	0.11/0.33
Step 2					
Southern Europe	March-May	3.22/8.19	Run off/Drainage	3.20/8.13	0.03/0.08

Table 8.9-55: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-11 following single/multiple applications to carrots, beetroot, celery root, radish, horseradish, swedes, turnip, chicory roots and salsifies (root vegetables, BBCH 11 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	10.88/21.77	-	10.81/21.61	0.11/0.22
Step 2					
Southern Europe	March-May	3.22/5.94	Run off/Drainage	3.20/5.30	0.03/0.06

Table 8.9-56: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-11 following single/multiple applications to onion, shallot, onion “seven years old and ornamentals (bulb vegetables, BBCH 13 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	10.88/21.77	-	10.81/21.61	0.11/0.22
Step 2					
Southern Europe	June-Sept	3.81/7.09	Run off/Drainage	3.78/7.04	0.04/0.07

Table 8.9-57: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-11 following single/multiple applications of CASINO ROYALE to cabbage, strawberry, parsnip and parsley (leafy vegetables, BBCH 15 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	10.88/21.77	-	10.81/21.61	0.11/0.22
Step 2					
Southern Europe	March-May	3.22/6.10	Runoff / Drainage	3.20/6.05	0.03/0.06

Table 8.9-58: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-11 following single/multiple applications of CASINO ROYALE to cherry (apple early application as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	9.17/18.34	-	9.10/18.20	0.09/0.18
Step 2					
Southern Europe	March-May	2.98/5.35	Runoff / Drainage	2.96/5.31	0.03/0.05

Table 8.9-59: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-11 following single/multiple applications of CASINO ROYALE to raspberry, blackcurrant, ornamentals, redcurrant and white currant (vines late application as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	13.85/27.69	-	13.75/27.49	0.14/0.28
Step 2					
Southern Europe	June-Sept	2.45/4.47	Runoff / Drainage	2.43/4.43	0.02/0.04

Table 8.9-60: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-13 following single/multiple applications to sugar beet

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	3.66/7.33	-	3.64/7.28	0.04/0.07
Step 2					
Southern Europe	June-Sept	0.39/0.72	Run off/Drainage	0.39/0.72	<0.01/0.01

Table 8.9-61: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-13 following single/multiple applications to tomato and eggplant (fruiting vegetables, BBCH 12 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	3.66/10.99	-	3.64/10.91	0.04/0.11
Step 2					
Southern Europe	March-May	1.09/2.76	Run off/Drainage	1.08/2.74	0.01/0.03

Table 8.9-62: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-13 following single/multiple applications to carrots, beetroot, celery root, radish, horseradish, swedes, turnip, chicory roots and salsifies (root vegetables, BBCH 11 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	3.66/7.33	-	3.64/7.28	0.04/0.07
Step 2					
Southern Europe	March-May	1.09/2.00	Run off/Drainage	1.08/1.99	0.01/0.02

Table 8.9-63: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-13 following single/multiple applications to onion, shallot, onion “seven years old and ornamentals (bulb vegetables, BBCH 13 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	3.66/7.33	-	3.64/7.28	0.04/0.07
Step 2					
Southern Europe	June-Sept	1.28/2.39	Run off/Drainage	1.27/2.37	0.01/0.02

Table 8.9-64: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-13 following single/multiple applications of CASINO ROYALE to cabbage, strawberry, parsnip and parsley (leafy vegetables, BBCH 15 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	3.66/7.33	-	3.64/7.28	0.04/0.07
Step 2					
Southern Europe	March-May	1.09/2.05	Runoff / Drainage	1.08/2.04	0.01/0.02

Table 8.9-65: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-013 following single/multiple applications of CASINO ROYALE to cherry (apple early application as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	3.09/6.18	-	3.06/6.13	0.03/0.06
Step 2					
Southern Europe	March-May	1.00/1.80	Runoff / Drainage	1.00/1.79	0.01/0.02

Table 8.9-66: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-13 following single/multiple applications of CASINO ROYALE to raspberry, blackcurrant, ornamentals, redcurrant and white currant (vines late application as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	4.66/9.32	-	4.63/9.26	0.05/0.09
Step 2					
Southern Europe	June-Sept	0.82/1.49	Runoff / Drainage	0.82/1.49	0.01/0.02

Table 8.9-67: FOCUS Step 1and 2PEC_{sw} and PEC_{sed} for BF 500-14 following single/multiple applications to sugar beet

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	7.08/14.16	-	7.03/14.06	0.07/0.14
Step 2					
Southern Europe	June-Sept	0.76/1.39	Run off/Drainage	0.76/1.38	0.01/0.01

Table 8.9-68: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-14 following single/multiple applications to tomato and eggplant (fruiting vegetables, BBCH 12 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	7.08/21.24	-	7.03/21.09	0.07/0.21
Step 2					
Southern Europe	March-May	2.10/5.33	Run off/Drainage	2.08/5.29	0.02/0.05

Table 8.9-69: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-14 following single/multiple applications to carrots, beetroot, celery root, radish, horseradish, swedes, turnip, chicory roots and salsifies (root vegetables, BBCH 11 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	7.08/14.16	-	7.03/14.06	0.07/0.14
Step 2					
Southern Europe	March-May	2.10/3.86	Run off/Drainage	2.08/3.84	0.02/0.04

Table 8.9-70: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-14 following single/multiple applications to onion, shallot, onion “seven years old and ornamentals (bulb vegetables, BBCH 13 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	7.08/14.16	-	7.03/14.06	0.07/0.14
Step 2					
Southern Europe	June-Sept	2.48/4.61	Run off/Drainage	2.46/4.58	0.02/0.05

Table 8.9-71: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-14 following single/multiple applications of CASINO ROYALE to cabbage, strawberry, parsnip and parsley (leafy vegetables, BBCH 15 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	7.08/14.16	-	7.03/14.06	0.07/0.14
Step 2					
Southern Europe	March-May	2.10/3.97	Runoff / Drainage	2.08/3.94	0.02/0.04

Table 8.9-72: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-14 following single/multiple applications of CASINO ROYALE to cherry (apple early application as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	5.97/11.93	-	5.92/11.84	0.06/0.12
Step 2					
Southern Europe	March-May	1.94/3.48	Runoff / Drainage	1.93/3.46	0.02/0.03

Table 8.9-73: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-14 following single/multiple applications of CASINO ROYALE to raspberry, blackcurrant, ornamentals, redcurrant and white currant (vines late application as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	9.01/18.02	-	8.94/17.88	0.09/0.18
Step 2					
Southern Europe	June-Sept	1.59/2.91	Runoff / Drainage	1.58/2.88	0.02/0.03

Table 8.9-74: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-15 following single/multiple applications to sugar beet

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	4.13/8.27	-	4.10/8.21	0.04/0.08
Step 2					
Southern Europe	June-Sept	0.44/0.81	Run off/Drainage	0.44/0.81	<0.01/0.01

Table 8.9-75: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-15 following single/multiple applications to tomato and eggplant (fruiting vegetables, BBCH 12 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	4.13/12.40	-	4.10/12.31	0.04/0.12
Step 2					
Southern Europe	March-May	1.22/3.11	Run off/Drainage	1.03.22/3.09	0.01/0

Table 8.9-76: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-15 following single/multiple applications to carrots, beetroot, celery root, radish, horseradish, swedes, turnip, chicory roots and salsifies (root vegetables, BBCH 11 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	4.13/8.27	-	4.10/8.21	0.04/0.08
Step 2					
Southern Europe	March-May	1.22/2.26	Run off/Drainage	1.22/2.24	0.01/0.02

Table 8.9-77: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-15 following single/multiple applications to onion, shallot, onion “seven years old and ornamentals (bulb vegetables, BBCH 13 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	4.13/8.27	-	4.10/8.21	0.04/0.08
Step 2					
Southern Europe	June-Sept	1.45/2.69	Run off/Drainage	1.44/2.67	0.01/0.03

Table 8.9-78: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-15 following single/multiple applications of CASINO ROYALE to cabbage, strawberry, parsnip and parsley (leafy vegetables, BBCH 15 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	4.13/8.27	-	4.10/8.21	0.04/0.08
Step 2					
Southern Europe	March-May	1.22/2.32	Runoff / Drainage	1.22/2.30	0.01/0.02

Table 8.9-79: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-015 following single/multiple applications of CASINO ROYALE to cherry (apple early application as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	3.48/6.97	-	3.46/6.91	0.03/0.07
Step 2					
Southern Europe	March-May	1.13/2.03	Runoff / Drainage	1.12/2.02	0.01/0.02

Table 8.9-80: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for BF 500-15 following single/multiple applications of CASINO ROYALE to raspberry, blackcurrant, ornamentals, redcurrant and white currant (vines late application as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	5.26/10.52	-	5.22/10.44	0.05/0.11
Step 2					
Southern Europe	June-Sept	0.93/1.70	Runoff / Drainage	0.92/1.68	0.01/0.02

Table 8.9-81: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for 500 M 58 following single/multiple applications to sugar beet

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	6.79/13.59	-	6.74/13.49	0.07/0.14
Step 2					
Southern Europe	June-Sept	0.73/1.34	Run off/Drainage	0.73/1.33	0.01/0.01

Table 8.9-82: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for 500 M 58 following single/multiple applications to tomato and eggplant (fruiting vegetables, BBCH 12 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	6.79/20.38	-	6.74/20.23	0.07/0.20
Step 2					
Southern Europe	March-May	2.01/5.11	Run off/Drainage	2.00/5.07	0.02/0.05

Table 8.9-83: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for 500 M 58 following single/multiple applications to carrots, beetroot, celery root, radish, horseradish, swedes, turnip, chicory roots and salsifies (root vegetables, BBCH 11 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	6.79/13.59	-	6.74/13.49	0.07/0.14
Step 2					
Southern Europe	March-May	2.01/3.71	Run off/Drainage	2.00/3.68	0.02/0.04

Table 8.9-84: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for 500 M 58 following single/multiple applications to onion, shallot, onion “seven years old and ornamentals (bulb vegetables, BBCH 13 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	6.79/13.59	-	6.74/13.49	0.07/0.14
Step 2					
Southern Europe	June-Sept	2.38/4.42	Run off/Drainage	2.36/4.39	0.02/0.04

Table 8.9-85: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for 500 M 58 following single/multiple applications of CASINO ROYALE to cabbage, strawberry, parsnip and parsley (leafy vegetables, BBCH 15 as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	6.79/13.59	-	6.74/13.49	0.07/0.14
Step 2					
Southern Europe	March-May	2.01/3.81	Runoff / Drainage	2.00/3.78	0.02/0.04

Table 8.9-86: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for 500 M 58 following single/multiple applications of CASINO ROYALE to cherry (apple early application as worst case)

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	5.73/11.46	-	5.69/11.36	0.06/0.11
Step 2					
Southern Europe	March-May	1.86/3.34	Runoff / Drainage	1.85/3.32	0.02/0.03

Table 8.9-87: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for 500 M 58 following single/multiple applications of CASINO ROYALE to raspberry, blackcurrant, ornamentals, redcurrant and white currant (vines late application as worst case)

Scenario	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21d PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
FOCUS					
Step 1	---	8.64/17.29	-	8.58/17.16	0.09/0.17
Step 2					
Southern Europe	June-Sept	1.53/2.79	Runoff / Drainage	1.51/2.77	0.02/0.03

zRMS comments:

Pyraclystrobin

PEC_{sw}/sed calculations have been accepted.
 The calculations cover proposed uses in GAP.

For PEC_{sw}/sed calculations at STEP 4, the values used for reduction in run off volume and flux and erosion mass and flux are 0.5 and 0.8 for 5 meters of vegetative buffer strip according to the Austrian Environmental Agency (AGES) and the values uses for reduction in run off volume and flux and erosion mass and flux were 0.7 and 0.9 respectively for 15 meters of vegetative buffer strip.

In opinion of zRMS-PL, the Step 4 PEC_{sw} calculations are not accepted because of according to Working Document of the Central Zone in the Authorisation of Plant Protection Products (2018), the following approaches for simulating in Step 4 are recommended for the Core Assessment: *Landscape And Mitigation Factors In Aquatic Risk Assessment. Volume 1. Extended Summary and Recommendations*”. Report of the FOCUS Working Group on Landscape and Mitigation Factors in Ecological Risk Assessment, EC Document Reference SANCO/10422/2005 v2.0. 169 pp and FOCUS (2007) and Working Document of the Central Zone in the Autorisation of Plant Protection Products (Environmental Fate and Behaviour. Ver.1.rev1. 2018).

However, 5 or 15 meters of vegetative buffer strip can be used at national level.

The PEC_{sw} in STEP4 and mitigation measure should be considered by individual MS.

GREENHOUSE uses

Boscalid

Table 8.9-88: PEC_{sw} and PEC_{sed} for Boscalid following single/multiple applications of CASINO ROYALE in greenhouse with TOXSWA v1.2

Scenario	PEC _{sw} actual (µg/L)	21 d- PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
NL standard - Spring	0.253/0.468	0.209/0.406	1.119/2.080
NL standard - Autumn	0.253/0.255	0.036/0.071	0.561/0.741

Pyraclostrobin and metabolites

PEC_{sw} and PEC_{sed} for metabolites have not been calculated since the aquatic risk is covered by the parent.

Table 8.9-89: PEC_{sw} and PEC_{sed} for Pyraclostrobin following single/multiple applications of CASINO ROYALE in greenhouse with TOXSWA v1.2

Scenario	PEC _{sw} actual (µg/L)	21 d- PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
NL standard - Spring	0.0611/0.099	0.036/0.067	0.722/1.418
NL standard - Autumn	0.0611/0.063	0.008/0.017	0.362/0.515

zRMS comments:

zRMS agrees with calculation for greenhouse. All intended uses are for outdoor uses is considered to cover the greenhouses uses. No further calculation is required.

8.9.2.3 PEC_{sw/sed} of CASINO ROYALE

The PEC_{sw} for CASINO ROYALE was calculated using the following equation:

$$PEC_{sw} (\mu g/L) = \frac{\%Drift_{90th\ \%ile} \times Application\ rate\ (g/ha)}{Water\ depth\ (cm) \times 10}$$

The application of CASINO ROYALE is 3 x 1500 g/ha for as worst case for field crops, 2 x 1000 g/ha for cherry (apple early application as worst case from drift values) and 2 x 1800 for berries (vines late application as worst case for drift value). The depth of the static water body was assumed to be 30 cm. The resulting maximum instantaneous PEC_{sw} value is presented in the table 8.9-90.

Table 8.9-90: PEC_{sw} for CASINO ROYALE following single/multiple applications to several crops

Crop	Distance (m)	Drift (%)	Max PEC _{sw} (µg/L)
Field crops	1	2.77/2.01	13.85/30.15
Apple early (as worst case)	3	29.20/25.53	97.33/168.2
Vines leate (as worst case)		8.02/7.23	48.12/86.76

The PEC_{sed} for CASINO ROYALE was calculated using the following equation:

$$PEC_{sed} (\mu g/kg dw) = \frac{\%Drift_{90th\%ile} \times Application\ rate\ (g/ha) \times \%Active\ substance\ in\ sediment}{1000 \times sediment\ density\ (g/cm^3) \times sediment\ height\ (cm)}$$

The application of CASINO ROYALE is 3 x 1500 g/ha for as worst case for field crops, 2 x 1000 g/ha for cherry (apple early application as worst case from drift values) and 2 x 1800 for berries (vines late application as worst case for drift value). The maximum percentage of Pyraclostrobin and Boscalid in the sediment is 62 and 79.9, respectively. The height of the sediment was assumed to be 5 cm and the sediment density was assumed to be 1.3 g/cm³. The resulting maximum instantaneous PEC_{sed} value is presented in the table 8.9-91

Table 8.9-91: PEC_{sed} for CASINO ROYALE following single/multiple applications to several crops

Crop	Distance (m)	Drift (%)	Substance	% in sediment	Max PEC _{sed} (µg/kg) (based on maximum occurrence)
Field crops	1	2.77/2.01	Pyraclostrobin	62.1	39.70/86.41
			Boscalid	79.9	51.08/111.18
Apple early (as worst case)	3	29.20/25.53	Pyraclostrobin	62.1	278.97/487.82
			Boscalid	79.9	358.94//627.65
Vines leate (as worst case)		8.02/7.23	Pyraclostrobin	62.1	137.92/248.67
			Boscalid	79.9	177.45/319.94

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

Table 8.10-1: Boscalid summary of atmospheric degradation and behaviour

Compound	Boscalid
Direct photolysis in air	Photolytically stable in water. Photolysis in air not

	expected. Not stable under influence of radicals.
Quantum yield of direct phototransformation	$<2.45 \times 10^{-4}$
Photochemical oxidative degradation in air	DT ₅₀ : < 1.1d AOPWIN Version 1.88, [OH radicals] = $8 \times 10^5 \text{ cm}^{-3}$
Volatilisation	Vapour pressure (Pa): 7.2×10^{-7} (20°C) Henry's Law Constant (Pa.m ³ /mol): 5.178×10^{-5}
Metabolites	-

Table 8.10-2: Pyraclostrobin summary of atmospheric degradation and behaviour

Compound	Pyraclostrobin
Direct photolysis in air	-
Quantum yield of direct phototransformation	2.17×10^{-1}
Photochemical oxidative degradation in air	DT ₅₀ : < 2h derived by the Atkinson model
Volatilisation	Vapour pressure (Pa): 2.6×10^{-8} (20°C) Henry's Law Constant (Pa.m ³ /mol): 5.307×10^{-6}
Metabolites	-

The vapour pressure at 20 °C of Boscalid and Pyraclostrobin is $< 10^{-5}$ Pa. Hence Boscalid and Pyraclostrobin are regarded as non-volatile. Therefore exposure of adjacent surface waters and terrestrial ecosystems by the Boscalid and Pyraclostrobin due to volatilization with subsequent deposition should not be considered.

zRMS comments:

Boscalid and pyraclostrobin have low volatilisation potential, are degraded fast by photochemical processes and the contamination of the compartment air not expected. Therefore exposure of adjacent surface waters and terrestrial ecosystems by the boscalid and pyraclostrobin due to volatilization with subsequent deposition should not be considered hence no further requirement are needed.

Appendix 1 Lists of data considered in support of the evaluation

Tables considered not relevant can be deleted as appropriate.

MS to blacken authors of vertebrate studies in the version made available to third parties/public.

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
-	-	-	-	-	-

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

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
-	-	-	-	-	-

The following tables are to be completed by MS

List of data submitted by the applicant and not 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
-	-	-	-	-	-

List of data relied on not submitted by the applicant but necessary for evaluation

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
-	-	-	-	-	-

Appendix 2 Detailed evaluation of the new Annex II studies

No new study was provided.

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

No additional information was provided.