FINAL REGISTRATION REPORT

Part B

Section 8

Environmental Fate

Detailed summary of the risk assessment

Product code: SHA 3600 B

Product name(s): LABAMBA

Chemical active substance(s):

Lambda cyhalothrin 10% CS, 100 g/L

Central Zone

Zonal Rapporteur Member State: Poland

CORE ASSESSMENT

Applicant: Sharda Cropchem España S.L.

Submission date: March 2022

MS Finalisation date: **04.2022; 11.2022**

Version history

When	What
03.2022	New dRR submitted for evaluation
04.2022	RMS evaluation
11.2022	Corrected after RR

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8 Fate and behaviour in the environment (KCP 9)

8.1 Critical GAP and overall conclusions

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

1	2	3	4	5	6	7	8	9	10	11	12	13	14	14
Use-No. (e)	**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 (f)	**Conclusion** **Groundwater**
					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			
		Zonal uses (field or outdoor uses, certain types of protected crops)												
1	CEU	Brassicas (cabbage, Brussels sprouts, cauliflower)	F	Aphids	Foliar Spray	BBCH 41-43	a) 1 b) 1		a) 0.075 b) 0.075	a) 0.0075 b) 0.0075	200-600	3 (cabbage), 7 (Brussels sprouts, cauliflower)		A
2	CEU	Brassicas (cabbage, Brussels sprouts, cauliflower)	F	Caterpillars	Foliar Spray	BBCH 41-43	a) 1 b) 1		a) 0.075 b) 0.075	a) 0.0075 b) 0.0075	200-600	3 (cabbage), 7 (Brussels sprouts, cauliflower)		A
3	CEU	Tomato	F	Aphids	Foliar Spray	BBCH 51-85	a) 1 b) 1		a) 0.075 b) 0.075	a) 0.0075 b) 0.0075	300-1000	3		A
4	CEU	Tomato	G	Whitefly	Foliar Spray	BBCH 51-85	a) 1 b) 1		a) 0.075 b) 0.075	a) 0.0075 b) 0.0075	300-1000	3		A
5	CEU	Winter cereals (wheat, barley, rye, oats, triticale)	F	Aphids	Foliar Spray	BBCH 41-75	a) 1 b) 1		a) 0.075 b) 0.075	a) 0.0075 b) 0.0075	200-400	28		A
6	CEU	Winter Oilseed rape	F	Aphids	Foliar Spray	BBCH 50-59	a) 1 b) 1		a) 0.075 b) 0.075	a) 0.0075 b) 0.0075	200-600	35		A
7	CEU	Winter Oilseed rape	F	Coleseed sawfly	Foliar Spray	BBCH 50-59	a) 1 b) 1		a) 0.075 b) 0.075	a) 0.0075 b) 0.0075	200-600	35		A
8	CEU	Winter Oilseed rape	F	Pollen beetle	Foliar Spray	BBCH 50-59	a) 1 b) 1		a) 0.075 b) 0.075	a) 0.0075 b) 0.0075	200-600	35		A
9	CEU	Winter Oilseed	F	Stem weevil	Foliar	BBCH 50-59	a) 1		a) 0.075	a) 0.0075	200-	35		A

1	2	3	4	5	6	7	8	9	10	11	12	13	14	14
Use-No. (e)	**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 (f)	**Conclusion** **Groundwater**
					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			
		rape			Spray		b) 1		b) 0.075	b) 0.0075	600			
		Interzonal uses (use as seed treatment, in greenhouses (or other closed places of plant production), as post-harvest treatment or for treatment of empty storage rooms)												
3														
4														
		Minor uses according to Article 51 (zonal uses)												
5														
6														
		Minor uses according to Article 51 (interzonal uses)												
7														
8														

* 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 Lambda cyhalothrin concerning the Section Environmental Fate

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Use-No. *	Member state(s)	Crop and/or situation (crop destination / purpose of crop)	F, Fn, Fpn G, Gn, Gpn or I **	Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)	Application				Application rate			PHI (days)	Remarks: e.g. g safener/ synergist per ha
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between applications (days)	kg 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-N	Spring Wheat	F	Cereal aphids (Sitobio, Rhopalosiphon padi, Metapolophium etc) Aphids as virus vectors Psammotettix alienus (Wheat dwarf virus vector), Zabrus, Oulemma, Delia sp., Gall midges (Sitodiplosis and Contarina sp.) and thrips.	Foliar spray	BBCH 10-85	a)1 b)2	18	a)0.075 b) 0.15	a)7.5 b)15.0	200-600		The last application should be made no later than at growth stage BBCH 83-85 STF
2	EU-N	Winter Wheat	F		Foliar spray	BBCH 10-85	a)1 b)2	18	a)0.075 b) 0.15	a)7.5 b)15.0	200-600		
3	EU-S	Spring Wheat	F	Cereal aphids (Sitobio, Rhopalosiphon padi, Metapolophium etc) Aphids as virus vectors Psammotettix alienus (Wheat dwarf virus vector), Zabrus, Oulemma, Delia sp., Gall midges (Sitodiplosis and Contarina sp.) and thrips. CS	Foliar spray	BBCH 10-85	a)1 b)2	18	a)0.075 b) 0.15	a)7.5 b)15.0	700-1000		The last application should be made no later than at growth stage BBCH 83-85 STF
4	EU-S	Winter Wheat	F		Foliar spray	BBCH 10-85	a)1 b)2	18	a)0.075 b) 0.15	a)7.5 b)15.0	700-1000		
5	EU-N	Winter Wheat	F	Aphids (Virus vectors)	Tractor mounted sprayer, broadcast, ground directed spray	BBCH 10 to 29 (≈ Oct./EUN)	a)1 b)2	14	a)0.075 b) 0.15	a)7.5 b)15.0	200-400		RMS comment: Note that winter wheat may be treated both in Oct and Jun. TFL
6	EU-N	Winter Wheat	F	Aphids	Tractor mounted sprayer, broadcast,	BBCH 30 to 79 (≈ Jun./EUN)	a)1 b)2	14	a)0.075 b) 0.15	a)7.5 b)15.0	200-400	30	RMS comment: Note that winter wheat may be treated both in Oct and Jun. TFL

					ground directed spray								
7	EU-N	Spring Wheat	F	Aphids	Tractor mounted sprayer, broadcast, ground directed spray	BBCH 30 to 79 (≈ Jun./EUN)	a)1 b)2	14	a)0.075 b) 0.15	a)7.5 b)15.0	200-400	30	TFL
8	EU-S	Winter Wheat	F	Aphids (Virus vectors)	Tractor mounted sprayer, broadcast, ground directed spray	BBCH 10 to 29 (Nov./EUS)	a)1 b)2	14	a)0.075 b) 0.15	a)7.5 b)15.0	200-400		RMS comment: Note that winter wheat may be treated both in Nov and May. TFL
9	EU-S	Winter Wheat	F	Aphids	Tractor mounted sprayer, broadcast, ground directed spray	BBCH 30 to 79 (May/EUS)	a)1 b)2	14	a)0.075 b) 0.15	a)7.5 b)15.0	200-400	30	RMS comment: Note that winter wheat may be treated both in Nov and May. TFL
10	EU-S	Spring Wheat	F	Aphids	Tractor mounted sprayer, broadcast, ground directed spray	BBCH 30 to 79 (May/EUS)	a)1 b)2	14	a)0.075 b) 0.15	a)7.5 b)15.0	200-400	30	TFL
11	EU-N	Tomato	F	Aphids for open field tomato use Whitefly (Trialeurodes and bemisia). Heliothis armigera and virescens	foliar spray	BBCH 10-89	a)1 b)2	12	a)0.125 b)0.25	a)12.5 b)25.0	80-1000	3	STF
12	EU-S	Tomato	F		foliar spray	BBCH 10-89	a)1 b)2	12	a)0.25 b)0.50	a)25.0 b)50.0	80-1000	3	STF
13	EU-N/S	Tomato	G		foliar spray	BBCH 10-89	a)1 b)2	12	a)0.25 b)0.50	a)25.0 b)50.0	200-2000	3	STF
14	EU-N	Plum	F	Cydia funebrana Aphids	foliar spray	BBCH 10-85(1)	a)1 b)2	10-14	a)0.10 b)20.0	a)10.0 b)20.0	1000-1500	7	STF
15	EU-S	Plum	F		foliar spray	BBCH 10-85(1)	a)1 b)2	10-14	a)0.25 b)0.50	a)25.0 b)50.0	1000-1500	7	STF
16	EU-N	Seed potato	F	Aphids (Virus vectors)	Tractor mounted sprayer, broadcast, ground di-	BBCH 15-39 (≈ Apr.)	a)1 b)2	7	a)0.075 b) 0.15	a)7.5 b)15.0	400-600		RMS comment: Note that Seed Potato may be treated both in Apr and Jun-Sep. Refers to potatoes that are to be used as seed

					rected spray								potatoes inthe next year. TFL
17	EU-N	Seed potato	F	Aphids, Colorado potato beetles	Tractor mounted sprayer, broadcast, ground directed spray	BBCH 40 to 85 (Jun. – Sep.)	a)1 b)2	7	a)0.075 b) 0.15	a)7.5 b)15.0	400-600	3	RMS comment: Note that Seed Potato may be treated both in Apr and Jun-Sep. Refers to potatoes that are to be used as seed potatoes inthe next year. TFL
18	EU-N	potato	F	Aphids, Colorado potato beetles	Tractor mounted sprayer, broadcast, ground directed spray	BBCH 40 to 85 (Jun. – Sep.)	a)1 b)2	7	a)0.075 b) 0.15	a)7.5 b)15.0	400-600	3	RMS comment: Refers to potatoesharvested forconsumption. TFL
19	EU-S	Seed potato	F	Aphids (Virus vectors)	Tractor mounted sprayer, broadcast, ground directed spray	BBCH 15-39 (Mar.)	a)1 b)1		a)0.20 b)0.20	a)20.0 b)20.0	400-1000		RMS comment: Note that Seed Potato may be treated both in Mar and May-Sep (min. 8(-10) days interval between applications). Refers to potatoes that are to be used as seed potatoes inthe next year. TFL
20	EU-S	Seed potato	F	Aphids, Colorado potato beetles	Tractor mounted sprayer, broadcast, ground directed spray	BBCH 40-85 (May – Sep).	a)1 b)1		a)0.20 b)0.20	a)20.0 b)20.0	400-1000	3	RMS comment: Note that Seed Potato may be treated both in Mar and May-Sep. (min. 8(-10) days interval between applications). Refers to potatoes that are to be used as seed potatoes in the next year. TFL
21	EU-S	potato	F	Aphids, Colorado potato beetles	Tractor mounted sprayer, broadcast, ground directed spray	BBCH 40-85 (May – Sep).	a)1 b)2	8	a)0.20 b)0.40	a)20.0 b)40.0	400-1000	3	RMS comment: Refers to potatoes harvested for consumption. TFL
22	EU-S	Peach	F	Thrips	Foliar spray	BBCH 53-69 (≈ Mar. – Apr.) BBCH 81-87 (≈	a)1 b)2	30	a)0.225 b)0.45	a)22.5 b)45.0	600-1000	7	TFL

						June.- Oct.)							

* 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

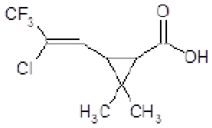
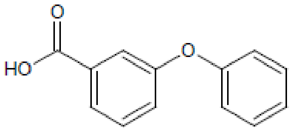
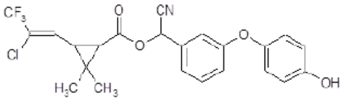
(1) During the written procedure the RMS indicated that the GAP for plums should be BBCH 10-79. EFSA proposes to leave unchanged the reported NEU and SEU GAPs on plums with regard to the BBCH GS (10-85). Indeed, at the proposed earlier BBCH 10-79, the PHI value of 7 days may become unappropriate.

zRMS comments:

All comments and conclusions of the zRMS are presented in grey. 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.

8.2 Metabolites considered in the assessment

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

Metabolite	Molar mass	Chemical structure	Maximum observed occurence in compartements	Exposure assessment required due to
I a	242.5		Soil:22.9% Water/sediment: 29.4%	PECsoil PECgw PECsw/sed
V(PBA)	214.2		Soil: 31.4% after 28 d Water/sediment: 28.5% after 15 d	PECsoil PECgw PECsw/sed
XV	465.9		Soil: 12.1 % Water/sediment: 10.5%	PECsoil PECgw PECsw/sed

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 Lambda-cyhalothrin and its metabolites

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

Lambda-cyhalothrin, Laboratory studies, aerobic conditions										
Soil name	**Soil type (x)**	**pH (x)**	**t.oC**	**MWHC %**	**DT50 (d)**	**DT90 (d)**	**DT50 (d) 20°C pF2/10kPa**	**Chi2 (%)**	**Kinetic model**	**Evaluated on EU level y/n/ Reference**
18 Acres	Sandy clay loam	5.5	20±2	pF2	19.7	2330		2.1	FOMC	y, EFSA, 2014
					17.5	323	141.5	2.7	DFOP k_2	y, EFSA, 2014
Nebraska	Loam	7.0[a]	20±2	pF2	36.9	123		12.6	SFO	y, EFSA, 2014
					18.8	158	60.3	2.8	DFOP k_2	y, EFSA, 2014
Marsillargues	Silty clay	7.3	20±2	pF2	24.8	82		11.8	SFO	y, EFSA, 2014
					16.2	141.7	42.7	5.5	FOMC	y, EFSA, 2014
Speyer 5M	Sandy loam[#]	7.2	20.1±0.1	pF2	49.4	164	49.4	12.1	SFO	y, EFSA, 2014
					27.5	274.7	115.5	5.7	DFOP k_2	y, EFSA, 2014
Am Fischteich	Silt loam	5.6	20.1±0.1	pF2	108	359	108	13.5	SFO	y, EFSA, 2014
					59.8	not. calc.	673	2.5	DFOP k_2	y, EFSA, 2014
Speyer 2.2	Loamy sand	5.5	20.1±0.1	pF2	163	541		5.8	SFO	y, EFSA, 2014
					303	934000		2.9	FOMC	y, EFSA, 2014
							1000		default*	y, EFSA, 2014
Geometric mean/Median (n=8)							**174.6**			
pH-dependency:							no			

[a] pH in water; for the other soils; in $CaCl_2$

[#] from the combined datasets for cyclopropyl- and phenoxy-labelled lambda provided in Adam 2012c ([Cyclopropyl-1-14C]Lambda-Cyhalothrin – Route and Rate of Degradation in One Soil, Innovative Environmental Services (IES) Ltd, Witterswil, Switzerland, IES No.: 20110032) and Adam 2012d [Phenoxy-U-14C]Lambda-Cyhalothrin – Route and Rate od Degradation in Four Soils, Innovative Environmental Services (IES) Ltd, Witterswil, Switzerland, IES No.: 20110031).
***the pattern of degradation is clearly bi-phasic but since it was not possible to obtain a reliable DT50 from the second phase of the bi-phasic kinetics, a worst case value of 1000 days was proposed at the Pesticide Peer Review Teleconference 97/**

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

metabolite Ia, Laboratory studies, aerobic conditions										
Soil name	**Soil type (x)**	**pH (x)**	**t.oC**	**MWHC %**	**DT50 (d)**	**DT90 (d)**	**DT50 (d) 20°C pF2/10kPa**	**Chi2 (%)**	**Kinetic model**	**Evaluated on EU level y/n/ Reference**
18 Acres	Sandy clay loam	5.4	20±2	pF2	3.1	10.2	3.1	11.8	SFO	y, EFSA, 2014
					2.4	13.4		9.1	FOMC	y, EFSA, 2014
Gartenacker	loam	7.1	20±2	pF2	4.0	13.4	4.0	12.4	SFO	y, EFSA, 2014
Marsillargues	Silty clay	7.6	20±2	pF2	15.8	52.5	15.8	6.8	SFO	y, EFSA, 2014
Speyer 5M	Sandy loam	7.2	20±2	pF2	19.1	63.6	19.1	24.1	SFO	y, EFSA, 2014
Speyer 2.2	Loamy sand	5.5	20±2	pF2	8.0	26.5	8.0	17.8	SFO	y, EFSA, 2014
Am Fischteich	Silt loam	5.6	20±2	pF2	5.4	63.9		6.1	FOMC	y, EFSA, 2014
							19.3		FOMC DT90/3.3.2	y, EFSA, 2014
Geometric mean (n=6)							**8.9**			
pH-dependency:							no			

Table 8.3-3: Summary of aerobic degradation rates for metabolite V (PBA) - laboratory studies

metabolite V (PBA), Laboratory studies, aerobic conditions										
Soil name	**Soil type (x)**	**pH (x)**	**t.oC**	**MWHC %**	**DT50 (d)**	**DT90 (d)**	**DT50 (d) 20°C pF2/10kPa**	**Chi2 (%)**	**Kinetic model**	**Evaluated on EU level y/n/ Reference**
Speyer 5M	Sandy loam	7.2	20.1±0.1	pF2	13.9	46.3	13.9	13.6	SFO[a]	y, EFSA, 2014
Speyer 2.2	Loamy sand	5.5	20.1±0.1	pF2	61.9	206	61.9	19.9	SFO[a]	y, EFSA, 2014
Am Fischteich	Silt loam	5.6	20.1±0.1	pF2	60.0	199	60.0	17.4	SFO[a]	y, EFSA, 2014

metabolite V (PBA), Laboratory studies, aerobic conditions										
Soil name	**Soil type (x)**	**pH (x)**	**t.oC**	**MWHC %**	**DT50 (d)**	**DT90 (d)**	**DT50 (d) 20°C pF2/10kPa**	**Chi2 (%)**	**Kinetic model**	**Evaluated on EU level y/n/ Reference**
Geometric mean (n=3)							**37.2**			
pH-dependency:							no			

[a] SFO for metabolite, FOMC for parent

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

metabolite XV, Laboratory studies, aerobic conditions										
Soil name	**Soil type (x)**	**pH (x)**	**t.oC**	**MWHC %**	**DT50 (d)**	**DT90 (d)**	**DT50 (d) 20°C pF2/10kPa**	**Chi2 (%)**	**Kinetic model**	**Evaluated on EU level y/n/ Reference**
18 Acres	Sandy clay loam	5.5	20±2	pF2	24.1	80.1	24.1	10.9	SFO[c]	y, EFSA, 2014
Nebraska	loam	7.0[a]	20±2	pF2	14.7	49.0	14.7	21.8	SFO[d]	y, EFSA, 2014
Marsillargues	Silty clay	7.3	20±2	pF2	24.2	80.3	24.2	33.7	SFO[d]	y, EFSA, 2014
East Anglia	Loamy sand	7.6[b]	20±2	pF2	2.9	48.6		6.3	FOMC	y, EFSA, 2014
							14.6		FOMC DT_{90}/3.32	y, EFSA, 2014
Frensham	Sandy loam	6.6[b]	20±2	pF2	7.6	25.2	7.6	13.1	SFO	y, EFSA, 2014
Hyde Farm	Sandy clay loam	6.9[b]	20±2	pF2	5.4	31.7		4.3	FOMC	y, EFSA, 2014
							9.6		FOMC DT_{90}/3.32	y, EFSA, 2014
Geometric mean (n=6)							**14.5**			
pH-dependency:							no			

[a] pH in water, otherwise in $CaCl_2$
[b] method for pH determination not started
[c] SFO for metabolite, FOMC for parent
[d] SFO for metabolite, DFOP for parent

8.3.2 Anaerobic degradation in soil (KCP 9.1.1.1)

8.3.2.1 Lambda cyhalothrin and its metabolites

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

Azoxystrobin, Laboratory studies, anaerobic conditions										
Soil name	**Soil type (USDA)**	**pH**	**t.oC**	**MWHC %**	**DT50 (d)**	**DT90 (d)**	**DT50 (d) 20°C pF2/10kPa**	**Chi2 (%)**	**Kinetic model**	**Evaluated on EU level y/n/ Reference**
Speyer 5M sandy loam	Sandy loam	7.3	20.8 ± 0.25	n.a.	134	445	n.a.	3.5-3.8	SFO	y, EFSA, 2014
18 Acres	Sandy clay loam	5.9	20 ± 2	n.a.	99	330	n.a.	6.0		
Geometric mean (n=2)					116.5	387.5				

n.a. Not applicable for anaerobic phase

8.4 Field studies (KCP 9.1.1.2)

The field dissipation rates of lambda cyhalothrin were evaluated during the draft assessment report. No additional studies have been performed.

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

8.4.1.1 Lambda-cyhalothrin and its metabolites

Studies on field dissipation rates with the formulation were not performed, since it is possible to extrapolate from data obtained with the active substance. In the table 8.4-1 summaries of field dissipation rates of lambda cyhalothrin in field studies are reported.

Triggering endpoints

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

Soil type (x)	**Location**	**pH (x)**	**Depth (cm)**	**DissT50 (d) actual**	**DT90 (d) actual**	**St. (x^2)**	**Method of calculation**	**Evaluated on EU level y/n/ Reference**
Varendorf Sandy loam	Germany	5.7	30 cm (d 0:10cm)	10.1	33.6	17.1	SFO	y, EFSA, 2014
Mechtersheim Silty clay loam	Germany	7.5	30 cm (d 0:10cm)	21.8	72.6	12.2	SFO	y, EFSA, 2014
Wang-Inzkofen Silt loam	Germany	7.2	30 cm (d 0:10cm)	28.0	93.0	15.7	SFO	y, EFSA, 2014

Soil type (x)	Location	pH (x)	Depth (cm)	DissT50 (d) actual	DT90 (d) actual	St. (x^2)	Method of calculation	Evaluated on EU level y/n/ Reference
Gachenbach Sandy loam	Germany	7.0	30 cm (d 0:10cm)	47.5	158	11.7	SFO	y, EFSA, 2014
			Maximum (n=4)	**47.5**	158			

8.4.2 Soil accumulation testing (KCP 9.1.1.2.2)

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 Lambda-cyhalothrin and its metabolites

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

Lambda-cyhalothrin							
Soil name	**Soil type**	**OC (%)**	**pH (-)**	**Kf (mL/g)**	**Kfoc (mL/g)**	**1/n (-)**	**Evaluated on EU level y/n/ Reference**
18 Acres	Sandy clay/loam	2.7	6.3	1290	47800	0.97	y, EFSA, 2014
Fresnsham	Sandy loam	1.2	6.2	464	38000	0.85	y, EFSA, 2014
Vicksburg	NA	0.7	6.0	1470	199000	0.89	y, EFSA, 2014
Goldsboro	NA	1.6	6.6	5350	345000	1.20	y, EFSA, 2014
Hyde Farm	NA	1.1	6.5	1780	162000	0.89	y, EFSA, 2014
East Anglia	Loamy sand	1.0	8.0	2080	210000	1.01	y, EFSA, 2014
Wisborough	NA	2.0	6.0	5440	276000	0.99	y, EFSA, 2014
ERTC	NA	0.3	6.8	1960	676000	0.99	y, EFSA, 2014
NRTC	NA	2.1	6.2	2360	110000	0.91	y, EFSA, 2014
Virginia waters	NA	2.6	6.6	1500	59000	0.80	y, EFSA, 2014
"Mesocosm"	NA	2.5	7.9	33000	1325000	1.21	y, EFSA, 2014
Millstream	NA	1.0	8.3	5560	562000	0.96	y, EFSA, 2014
Iron Hatch	NA	0.5	8.3	2520	548000	1.01	y, EFSA, 2014
Old Basing	NA	4.4	7.8	1660	38000	0.85	y, EFSA, 2014
				Worst case	**38000**	1	
				pH-dependency y/n	No		

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

Metabolite Ia							
Soil Name	**Soil Type**	**OC (%)**	**pH (-)**	**Kf (mL/g)**	**Kfoc (mL/g)**	**1/n (-)**	**Evaluated on EU level y/n/ Reference**
18 acres	Sandy clay loam	3.2	5.4	3.01	93	1.01	y, EFSA, 2014
Gartencker	loam	2.5	7.1	0.314	13	0.95	y, EFSA, 2014
Marsillargues	loam	0.58	7.6	0.079	14	0.89	y, EFSA, 2014
Speyer 5 M	Sandy loam	1.0	7.3	0.188	18	0.52	y, EFSA, 2014
Am Fischteich	Silt loam	1.7	6.4	0.351	21	0.97	y, EFSA, 2014
Speyer 2.2	loam sand	1.3	5.4	1.06	79	0.95	y, EFSA, 2014
Arithmetic mean (n=6)					**40**	0.88	y, EFSA, 2014
pH-dependency y/n					Yes; stronger adsorption under acidic conditions; suggested input for modelling: worst-case **Kfoc 13 mL**/g together with 1/n 0.95.		

Table 8.5-3: Summary of soil adsorption/desorption for metabolite XV

Metabolite XV							
Soil Name	**Soil Type**	**OC (%)**	**pH (-)**	**Kf (mL/g)**	**Kfoc (mL/g)**	**1/n (-)**	**Evaluated on EU level y/n/ Reference**
Hyde Farm	Sandy clay	1.9	6.9	1200	60000	0.98	y, EFSA, 2014
East Anglia	Loamy sand	1.3	7.6	1600	78000	1.05	y, EFSA, 2014
Kenny Hill	Sandy loam	3.0.	8.5	1900	110000	1.08	y, EFSA, 2014
Champaign	Silty clay	2.0	5.1	20000	67000	1.01	y, EFSA, 2014
Frensham	Sandy loam	1.5	6.6	1100	75000	0.97	y, EFSA, 2014
18 Acres	Sandy loam	1.8	7.4	900	68000	1.02	y, EFSA, 2014
Worst case					**60000**	1	
pH-dependency y/n					no		

Metabolite V (PBA) was estimated by the quantitative structure activity relationship (QSAR) calculation software EPI Suite v. 4.10 and EPI Web v.4.0. to exhibit medium mobility in soil (Koc = 217.8 ml/g ; 1/n =1(default)). (EFSA, 2014)

8.5.2 Column leaching (KCP 9.1.2.1)

Studies on column leaching with the formulation were not performed, since it is possible to extrapolate from data obtained with the active substance: Column leaching study with 3 soils (71-89% sand) in duplicate with 200 mm water applied over 48 hours. A quantity <0.65 µg/l was found in all but one replicate soil column, in which 0.86 µg/l was found in leachate. The conservative nature of the test conditions considered to support the low potential for leaching of lambda-cyhalothrin. (EFSA, 2014)

8.5.3 Lysimeter studies (KCP 9.1.2.2)

No problems concerning the ground water contamination are expected, as confirmed by the PECgw computer simulation for Lambda-cyhalothrin and its metabolites. Therefore, a lysimeter study with Lambda-cyhalothrin is not necessary.

8.5.4 Field leaching studies (KCP 9.1.2.3)

Field leaching studies have not been conducted for the active substance as sufficient information can be derived from the existing studies.

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 Lambda-cyhalothrin and its metabolites

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

lambda-cyhalothrin Distribution (max. water: 71.5% (Old Basing) – 49.3 % (Virginia water) (both on day 0) /max in sediment70.2% (day 1) (Old Basing) – 60.9% (day 4) (Virginia water)										
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**
Old Basing sandy loam 7.5 % OC	7.2-7.8/7.8	21.0	69.8	7.8	0.19	3.3	9.7	-	-	y, EFSA, 2014
Virginia water sand 0.5% OC	6.8-7.2/7.1	10.9	36.1	8.6	0.28	5.0	8.6	-	-	y, EFSA, 2014
Geometric mean (n=2)		**15.1**								

Table 8.6-2: Summary of observed metabolites

Metabolite Ia Water/ sediment system	Max formation in whole system: 22.0 % (day 30 in Old Basing); 29.4 % (day 30 in Virginia water) Distribution (max. water: 11.4% (day 30 in Old Basing) – 29.4 % (day 30 in Virginia water) /max in sediment 10.6% (day 30 in Old Basing) – 5.3% (day 58 in Virginia water)	EFSA, 2014
Metabolite XV Water /sediment system	Max formation in whole system: <10% (Old Basing); 10,5 % (day 14 in Virginia water)	EFSA, 2014

	Distribution (max. water: 1.3% (day 4 in Virginia water) /max in sediment 9.6% (day 14 in Virginia water)	
Metabolite V Water /sediment system	Max. in water/sediment 28.5% (max observed in photolysis study in natural water, day 15)	EFSA, 2014

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

8.7.1 Justification for new endpoints

The used endpoints are the EU agreed ones.

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

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

Use No.	1, 2	3, 4*	5	6, 7, 8, 9
Crop	**Brassicas (cabbage, Brussels sprouts, cauliflower)**	**Tomato**	**Winter cereals (wheat, barley, rye, oats, triticale)**	**Winter Oilseed rape**
Application rate (g as/ha)	7.5			
Number of applications/interval	1/-			
Crop interception (%)	70	80	90	80
Depth of soil layer (relevant for plateau concentration) (cm)	20			

*** Covered by field use 3.**

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 (%)**	**DT_{50} (days)**	**Value in accordance to EU endpoint y/n/ Reference**
Lambda-cyhalothrin	449.9	-	**47.5** (worst field DT_{50})	y, EFSA, 2014
metabolite IA	242.5	22.9	**19.1** (worst case, not normalized)	y, EFSA, 2014
metabolite V (PBA)	214.2	31.4	**134** (worst case parent anaerobic conditions)	y, EFSA, 2014
metabolite XV	465.9	12.1	**24.2**	y, EFSA, 2014

As concluded into the draft Registration Report and also into EFSA Journal 2014; 12 (5): 3677, soil accumulation and plateau concentration are not required for lambda cyhalothrin.

For Northern Europe, it was considered acceptable to use the worst field DT50 of 47.5d (Lambda Cyhalothrin RAR, Annex B8, Karate 10 CS, page 5), since all the trials were performed in Germany.

Considering that the present application is aimed to the registration of the product into the Central Zone, the use of the worst-case field DT50 is considered appropriate

8.7.2.1 Lambda-cyhalothrin and its metabolites

Table 8.7-3: PEC_{soil} for Lambda-cyhalothrin on brassicas

PEC_{soil} (mg/kg)		Brassicas	
		Single application	
		Actual	TWA
Initial		**0.003**	-
Short term	24h	0.003	0.003
	2d	0.003	0.003
	4d	0.003	0.003
Long term	7d	0.003	0.003
	14d	0.002	0.003
	21d	0.002	0.003
	28d	0.002	0.002
	50d	0.001	0.002
	100d	0.001	0.002
Plateau concentration (20 cm) after year		-	-
$PEC_{accumulation}$ (PEC_{act} +$PEC_{soil\ plateau}$)		-	-

PEC_{soil} of metabolites

PEC_{soil} values for the metabolites were determined as for the parent with an application rate corrected taking into account the molecular weights (MW) and the maximum occurrence of the metabolite in soil as following:

Application $rate_{metabolite}$ = ($MW_{metabolite}$/ MW_{parent}) x (% maximum occurrence/100) x application $rate_{parent}$

The corresponding application rates for each metabolite are summarized in the table below.

Table 8.7-5: Application rates for each relevant metabolite

Active substance	Metabolite	Application rate of the parent (g/ha)	MW parent	MW metabolite	Maximum occurrence in soil (%)	Corrected application rate (g/ha)
Lambda-cyhalothrin	Ia	7.5	449.9	242.5	22.9	0.93
	V (PBA)			214.2	31.4	1.12
	XV			465.9	12.1	0.94

Table 8.7-6: PEC_{soil} for metabolite Ia on brassicas

PEC_{soil} (mg/kg)		brassicas	
		Single application	
		Actual	TWA
Initial		**<0.001**	-
Short term	24h	<0.001	<0.001
	2d	<0.001	<0.001
	4d	<0.001	<0.001
Long term	7d	<0.001	<0.001
	14d	<0.001	<0.001
	21d	<0.001	<0.001
	28d	<0.001	<0.001
	50d	<0.001	<0.001
	100d	<0.001	<0.001
Plateau concentration (20 cm) after year		-	-
$PEC_{accumulation}$ (PEC_{act} +$PEC_{soil\ plateau}$)		-	-

Table 8.7-8: PEC_{soil} for metabolite V (PBA) on brassicas

PEC_{soil} (mg/kg)		brassicas	
		Single application	
		Actual	TWA
Initial		**<0.001**	-
Short term	24h	<0.001	<0.001
	2d	<0.001	<0.001
	4d	<0.001	<0.001
Long term	7d	<0.001	<0.001
	14d	<0.001	<0.001
	21d	<0.001	<0.001
	28d	<0.001	<0.001
	50d	<0.001	<0.001
	100d	<0.001	<0.001
Plateau concentration (20 cm) after year		-	-
$PEC_{accumulation}$ (PEC_{act} +$PEC_{soil\ plateau}$)		-	-

Table 8.7-10: PEC_{soil} for metabolite XV on brassicas

PEC_{soil} (mg/kg)		brassicas	
		Single application	
		Actual	TWA
Initial		**<0.001**	-
Short term	24h	<0.001	<0.001
	2d	<0.001	<0.001
	4d	<0.001	<0.001
Long term	7d	<0.001	<0.001
	14d	<0.001	<0.001
	21d	<0.001	<0.001
	28d	<0.001	<0.001
	50d	<0.001	<0.001
	100d	<0.001	<0.001
Plateau concentration (20 cm) after year		-	-
$PEC_{accumulation}$ (PEC_{act} +$PEC_{soil\ plateau}$)		-	-

8.7.2.2 PEC_{soil} of LABAMBA

Table 8.7-12: PEC_{soil} for lambda cyhalothrin 10% CS on worst cases

Active substance/ reparation	**Crop**	**Application rate**	**Interception (%)**	**PEC_{act} (mg/kg)**
Lambda cyhalothrin / Lambda cyhalothrin 10 CS	brassicas	76.523*	70	0.031

***density 1.0203 kg/L**

zRMS comments:

zRMS was accepted the used endpoints and calculations. PEC_{soil} for lambda-cyhalothrin and its metabolites Ia, V and XV were calculated by the Applicant by using the FOCUS guidance considering the worst-case use (brassicas). The crop interception were set in accordance to the actual guideline (EFSA Journal 2014;12(5):3662).
The PEC_{soil} for the formulation was based on the worst-case rates and on a specific density of 1.0203 g/mL.
The calculations cover all proposed uses in field and permanent greenhouse (according to EU Regulation 1107/2009).
The results of calculations are acceptable to describe predicted environmental concentrations of *lambda*-cyhalothrin in soil after application of *lambda*-cyhalothrin 10 CS in according with GAP and are appropriate to be used for the subsequent risk assessment for soil organisms.
Agreed PEC_{soil} values are presented in Tables 8.7-4 - 8.7-12.

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

8.8.1 Justification for new endpoints

Not relevant, no deviation.

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

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

Use No.	1, 2	3, 4*	5	6, 7, 8, 9
Crop	**Brassicas (cabbage, Brussels sprouts, cauliflower)**	**Tomato**	**Winter cereals (wheat, barley, rye, oats, triticale)**	**Winter Oilseed rape**
Application rate (g as/ha)	7.5			
Number of applications/interval	1/-			
Crop interception (%)	70	80	90	80
Frequency of application	annual			
Models used for calculation	FOCUS PEARL v5.5.5, FOCUS PELMO v6.6.4			

***Covered by field use 3**

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

Scenario	**Application dates (absolute)***			
Use No:	1, 2	3, 4**	5	6, 7, 8, 9
Crop:	**Brassicas (cabbage, Brussels sprouts, cauliflower)**	**Tomato**	**Winter cereals (wheat, barley, rye, oats, triticale)**	**Winter Oilseed rape**
Châteaudun	05/06	15/06	02/05	31/03
Hamburg	05/06	07/06	14/05	27/04
Jokioinen	07/09	-	29/05	-
Kremsmünster	05/06	07/06	09/05	25/04
Okehampton	-	-	30/04	20/04
Piacenza	-	15/06	07/04	27/03
Porto	20/05	19/05	04/03	23/02
Sevilla	04/05	17/05	25/01	-
Thiva	06/10	15/05	13/02	-

***First application according to AppDate v3.06 (28/06/2019)**

****Greenhouse Tomato use no. 4 PEC_{GW} is covered by field use 3.**

8.8.2.1 Lambda-cyhalothrin and its metabolites

Table 8.8-3: Input parameters related to active substance Lambda-cyhalothrin and metabolite(s) for PEC_{gw} calculations

Compound	Lambda-cyhalothrin	metabolite Ia	metabolite V (PBA)	Metabolite XV	Value in accordance with EU endpoint y/n/ Reference*
Molecular weight (g/mol)	449.9	242.5	214.2	465.9	y, EFSA, 2014
Water solubility (mg/L) at 20ºC	0.005	56	0.005	0.005	
Saturated vapour pressure (Pa):	0				
DT50 in soil (d)	175 (geomean from lab. studies, normalisation to 10kPa/pF2, 20°C with Q10 of 2.58, n=**6**)	8.9 (geomean from lab. studies, normalisation to 10kPa/pF2, 20°C with Q10 of 2.58, n=6)	37.2 (geomean from lab. studies, normalisation to 10kPa/pF2, 20°C with Q10 of 2.58, n=3)	14.5 (geomean from lab. studies, normalisation to 10kPa/pF2, 20°C with Q10 of 2.58, n=7)	
K_{foc} (mL/g)/K_{fom}	38000/22000	13.0/7.54	159/92.2	60000/34800	
1/n	1	0.95	0.965	1	
Plant uptake factor	0				
Formation fraction	-	0.65 from parent, 1.0 from XV	0.20 from parent	0.15 from parent	

Table 8.8-4: PEC_{gw} for Lambda-cyhalothrin and metabolites on brassicas use no. 1, 2 (with FOCUS PEARL 5.5.5/PELMO 6.6.4)

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)							
		Lambda-cyhalothrin		metabolite Ia		metabolite V (PBA)		Metabolite XV	
		PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO
Brassicas use no. 1 & 2	Châteaudun	<0.001	<0.001	0.007	0.006	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	<0.001	0.042	0.049	<0.001	<0.001	<0.001	<0.001
	Jokioinen	<0.001	<0.001	0.035	0.057	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	0.013	0.016	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	0.020	0.034	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	0.005	0.005	<0.001	<0.001	<0.001	<0.001

	Thiva	<0.001	<0.001	0.007	0.013	<0.001	<0.001	<0.001	<0.001

Table 8.8-5: PEC$_{gw}$ for Lambda-cyhalothrin and metabolites on tomato use no. 3 & 4 (with FOCUS PEARL 5.5.5/PELMO 6.6.4)

Crop	Scenario	80th Percentile PEC$_{gw}$ at 1 m Soil Depth (µg/L)							
		Lambda-cyhalothrin		metabolite Ia		metabolite V (PBA)		Metabolite XV	
		PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO
Tomato use no. 3 & 4	Châteaudun	<0.001	<0.001	0.004	0.003	<0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	0.011	0.016	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	0.014	0.022	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	0.003	0.005	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	0.002	0.003	<0.001	<0.001	<0.001	<0.001

Table 8.8-6: PEC$_{gw}$ for Lambda-cyhalothrin and metabolites on winter cereals, use no. 5 (with FOCUS PEARL 5.5.5/PELMO 6.6.4)

Crop	Scenario	80th Percentile PEC$_{gw}$ at 1 m Soil Depth (µg/L)							
		Lambda-cyhalothrin		metabolite Ia		metabolite V (PBA)		Metabolite XV	
		PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO
Winter cereals, use no. 5	Châteaudun	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	<0.001	0.013	0.014	<0.001	<0.001	<0.001	<0.001
	Jokioinen	<0.001	<0.001	0.010	0.014	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	0.004	0.004	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	0.009	0.012	0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	0.004	0.008	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	0.006	0.011	<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	0.002	<0.001	<0.001	<0.001	<0.001

Table 8.8-7: PEC$_{gw}$ for Lambda-cyhalothrin and metabolites on winter oilseed rape, use 6, 7, 8 & 9 (with FOCUS PEARL 5.5.5/PELMO 6.6.4)

Crop	Scenario	80th Percentile PEC$_{gw}$ at 1 m Soil Depth (µg/L)							
		Lambda-cyhalothrin		metabolite Ia		metabolite V (PBA)		Metabolite XV	
		PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO
Winter oilseed	Châteaudun	<0.001	<0.001	0.002	0.004	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	<0.001	0.027	0.034	<0.001	<0.001	<0.001	<0.001

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)							
		Lambda-cyhalothrin		metabolite Ia		metabolite V (PBA)		Metabolite XV	
		PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO
rape, use no. 6, 7, 8 & 9	Kremsmünster	<0.001	<0.001	0.008	0.010	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	0.019	0.030	<0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	0.008	0.022	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	0.014	0.039	<0.001	<0.001	<0.001	<0.001

Conclusions

The PECgw for Lambda cyhalothrin at its soil metabolites were all below 0.1 µg/L in all crops and scenarios. Therefore, the use of LABAMDA doesn’t pose any risk for ground water and no relevant assessment for metabolites according to SANCO/221/2000 –rev.11 is necessary.

zRMS comments:

The calculation of PECgw for lambda-cyhalothrin and its metabolites, metabolite Ia, metabolite XV and metabolite V (PBA) are accepted by the ZRMS. PECgw values were calculated following agreed LoEP (EFSA Journal 2014;12(5):3677). PECgw for lambda-cyhalothrin and its metabolites Ia, V and XV were calculated by the Applicant using the FOCUS PEARL (and PELMO models. Interception is appropriate to the proposed
BBCH of crops (guidance, 2014).
All leaching simulation run with FOCUS PELMO and FOCUS PEARL resulted in PECgw values below 0.1 µg/L for lambda-cyhalothrin and its metabolites.

PEC_{gw} for lambda-cyhalothrin and its metabolites calculated by RMS by using FOCUS MACRO (version 5.5.4) has been <0.001 µg/L for all crops proposed in GAP.

The calculations performed for using in field cover all proposed uses in permanent greenhouse (according to EU Regulation 1107/2009).

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

8.9.1 Justification for new endpoints

Not relevant, no new endpoints.

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

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

Use No.	1, 2	3, 4	5	6, 7, 8, 9
Crop	**Brassicas (cabbage, Brussels sprouts, cauli-flower)**	**Tomato**	**Winter cereals (wheat, barley, rye, oats, triticale)**	**Winter Oilseed rape**
Application rate (g as/ha)	7.5			
Number of applications/interval	1/-			
Application window	March-May/June-September			
Application method	Foliar spray			
CAM (Chemical application method)	CAM2			
Soil depth (cm)	5			
Models used for calculation	FOCUS STEP 1/2 v3.2 FOCUS SWASH v5.3, FOCUS PRZM v4.3.1, FOCUS MACRO v5.5.4, FOCUS TOXWA v4.4, SWAN 5.0.0, TOXSWA v1.2			

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

Scenario	**Application dates (absolute)***				
	Brassicas (cabbage, Brussels sprouts, cauliflower) 1st	**Brassicas (cabbage, Brussels sprouts, cauliflower) 2nd**	**Tomato****	**Winter cereals (wheat, barley, rye, oats, triticale)**	**Winter Oilseed rape**
D1	-	-	-	27/04	-
D2	-	-	-	06/05	28/04
D3	10/06	14/09	-	22/05	09/04
D4	27/07	-	-	22/04	18/04
D5	-	-	-	06/04	05/04
D6	06/10	-	15/05	03/03	-
R1	05/06	09/09	-	11/05	05/05
R2	20/05	08/09	19/05	-	-
R3	04/05	18/08	15/06	07/04	29/03
R4	04-05	18/08	26/05	06/03	-

***First application according to AppDate v3.06 (28/06/2019)**
****National scenarios relevant for Poland are D3, D4 and R1. Due to fact that drainage scenarios (D3, D4 and R1) are not available for tomato in programs used for modelling, a surrogate crop was proposed. Presented calculation was done for vegetables leafy 1st, for scenarios D3, D4 and R1 considering all input data as for vegetables leafy 1st.**

8.9.2.1 Lambda cyhalothrin and its metabolites

Table 8.9-3: Input parameters related to active substance Lambda-cyhalothrin and metabolites for $PEC_{sw/sed}$ calculations STEP 1/2 and 3/4

<table>
<tr><th>Compound</th><th>Lambda-cyhalothrin</th><th>metabolite Ia</th><th>metabolite V (PBA)</th><th>Metabolite XV</th><th>Value in accordance to EU endpoint y/n/
Reference</th></tr>
<tr><td>Molecular weight (g/mol)</td><td>450</td><td>242.5</td><td>214.1</td><td>465.9</td><td rowspan="3">y, EFSA, 2014</td></tr>
<tr><td>Saturated vapour pressure (Pa)</td><td colspan="4">0</td></tr>
<tr><td>Water solubility (mg/L)</td><td>0.005</td><td>56</td><td colspan="2">0.005</td></tr>
<tr><td>Diffusion coefficient in water (m²/d)</td><td colspan="4">4.3 x 10^{-5}</td><td rowspan="2">default</td></tr>
<tr><td>Diffusion coefficient in air (m²/d)</td><td colspan="4">0.43</td></tr>
<tr><td>K_{foc} (mL/g)</td><td>38000 (worst case)
189959 (geomean, n=14)*</td><td>13</td><td>159</td><td>60000</td><td rowspan="3">y, EFSA, 2014</td></tr>
<tr><td>Freundlich Exponent 1/n</td><td>1 (worst case)
0.97 (aritmethic mean, n=14)*</td><td>0.95</td><td>0.965</td><td>1</td></tr>
<tr><td>Plant Uptake</td><td colspan="4">0</td></tr>
<tr><td>Wash-Off factor from Crop (1/mm)</td><td colspan="4">0.05 (MACRO)
0.50 (PRZM)</td><td>default</td></tr>
<tr><td>$DT_{50,soil}$ (d)</td><td>175</td><td>8.9</td><td>37.2</td><td>14.5</td><td rowspan="5">y, EFSA, 2014</td></tr>
<tr><td>$DT_{50,water}$ (d)</td><td>1000</td><td rowspan="3">7.7</td><td rowspan="3">1000</td><td rowspan="2">1000</td></tr>
<tr><td>$DT_{50,sed}$ (d)</td><td>15.1</td></tr>
<tr><td>$DT_{50,whole\ system}$ (d)</td><td>15.1</td><td>5.8</td></tr>
<tr><td>Maximum occurrence observed (% molar basis with respect to the parent)</td><td>-</td><td>Soil: 22.9
Water: 29.4
Sediment: 10.6 Total system: 29.4</td><td>Soil:31.4
Water: 28.5 in photolysis study</td><td>Soil: 12.1
Water: 1.3
Sediment: 9.6
Total system: 10.5</td></tr>
</table>

***Used for refinements**

PEC$_{sw/sed}$

Table 8.9-4: FOCUS Step 1, 2 and 3 PEC$_{sw}$ and PEC$_{sed}$ for Lambda-cyhalothrin following single application of LABAMBA to brassicas use no. 1 & 2

Scenario FOCUS	Waterbody	Max PEC$_{sw}$ (µg/L)	Dominant entry route	21d- PEC$_{sw,twa}$ (µg/L)	Max PEC$_{sed}$ (µg/kg)
Step 1	---	0.12	-	0.03	18.39
Step 2					
Northern Europe	March-May	0.07	-	0.01	1.51
Southern Europe	March-May	0.07	-	0.01	2.59
Northern Europe	June-Sept	0.07	-	0.01	1.51
Southern Europe	June-Sept	0.07	-	0.01	2.05
Step 3					
D3*	ditch	0.0462	Drift	0.0024	0.1129
D3**	ditch	0.0460	Drift	0.0015	0.0941
D4*	pond	0.0016	Drift	0.0009	0.0129
D4*	stream	0.0329	Drift	0.0000	0.0162
D6*	ditch	0.0460	Drift	0.0015	0.0937
R1*	pond	0.0018	Drift	0.0014	0.0541
R1**	pond	0.0019	Drift	0.0012	0.0575
R1*	stream	0.0306	Drift	0.0006	0.7666
R1**	stream	0.0306	Drift	0.0004	0.7590
R2*	stream	0.0409	Drift	0.0002	0.7366
R2**	stream	0.0409	Drift	0.0003	2.0810
R3*	stream	0.0430	Drift	0.0009	2.1080
R3**	stream	0.0429	Drift	0.0007	1.6590
R4*	stream	0.0373	Drift	0.0010	0.8377
R4**	stream	0.0306	Drift	0.0008	1.8440

***vegetables leafy 1st**
****vegetables leafy 2nd**

Table 8.9-5: FOCUS Step 1, 2 and 3 PEC$_{sw}$ and PEC$_{sed}$ for Lambda-cyhalothrin following single application of LABAMBA to ~~tomato use no. 3~~

Scenario FOCUS	Waterbody	Max PEC$_{sw}$ (µg/L)	Dominant entry route	21d- PEC$_{sw,twa}$ (µg/L)	Max PEC$_{sed}$ (µg/kg)
Step 1	---	0.12	-	0.03	18.39
Step 2					

Scenario FOCUS	**Waterbody**	**Max PEC_{sw} (µg/L)**	**Dominant entry route**	**21d- $PEC_{sw,twa}$ (µg/L)**	**Max PEC_{sed} (µg/kg)**
Northern Europe	March-May	0.07	-	0.01	2.59
Southern Europe	March-May	0.07	-	0.01	1.51
Northern Europe	June-Sept	0.07	-	0.01	1.51
Southern Europe	June-Sept	0.07	-	0.01	2.05
Step 3					
D3*	ditch	0.0462	Drift	0.0024	0.1129
D4*	pond	0.0016	Drift	0.0009	0.0129
D4*	stream	0.0329	Drift	0.0000	0.0162
D6	ditch	0.0458	Drift	0.0012	0.0855
R1*	pond	0.0018	Drift	0.0014	0.0541
R1*	stream	0.0306	Drift	0.0006	0.7666
R2	stream	0.0409	Drift	0.0002	1.2320
R3	stream	0.0431	Drift	0.0009	0.5546
R4	stream	0.0297	Drift	0.0007	1.0601

***National scenarios relevant for Poland are D3, D4 and R1. Due to fact that drainage scenarios (D3, D4 and R1) are not available for tomato in programs used for modelling, the surrogate crop was proposed. Presented calculation was done for vegetables leafy 1st, for scenarios D3, D4 and R1 considering all input data as for vegetables leafy 1st.**

Table 8.9-6: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Lambda-cyhalothrin following single application of LABAMBA to winter cereals use no. 5

Scenario FOCUS	**Waterbody**	**Max PEC_{sw} (µg/L)**	**Dominant entry route**	**21d- $PEC_{sw,twa}$ (µg/L)**	**Max PEC_{sed} (µg/kg)**
Step 1	---	0.12	-	0.03	18.39
Step 2					
Northern Europe	Mar-May	0.07	-	0.01	1.51
Southern Europe	Mar-May	0.07	-	0.01	2.59
Northern Europe	June-Sept	0.07	-	0.01	1.51
Southern Europe	June-Sept	0.07	-	0.01	2.05
Step 3					
D1	ditch	0.0467	Drift	0.0143	0.2155
D1	stream	0.0404	Drift	0.0012	0.0808

Scenario FOCUS	Waterbody	Max PEC_{sw} (µg/L)	Dominant entry route	21d- $PEC_{sw,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
D2	ditch	0.0467	Drift	0.0079	0.2119
D2	stream	0.0413	Drift	0.0063	0.1867
D3	ditch	0.0462	Drift	0.0025	0.1135
D4	pond	0.0016	Drift	0.0010	0.0151
D4	stream	0.0363	Drift	0.0001	0.0252
D5	pond	0.0016	Drift	0.0010	0.0157
D5	stream	0.0368	Drift	0.0001	0.0206
D6	ditch	0.0461	Drift	0.0025	0.1099
R1	pond	0.0016	Drift	0.0011	0.0236
R1	stream	0.0303	Drift	0.0005	0.3165
R3	stream	0.0430	Drift	0.0008	0.3589
R4	stream	0.0304	Drift	0.0007	0.7329

Table 8.9-7: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Lambda-cyhalothrin following single application of LABAMBA to winter oilseed rape use no. 6, 7, 8 & 9

Scenario FOCUS	Waterbody	Max PEC_{sw} (µg/L)	Dominant entry route	21d- $PEC_{sw,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
Step 1	---	0.12	-	0.03	18.39
Step 2					
Northern Europe	Mar-May	0.07	-	0.01	1.33
Southern Europe	Mar-May	0.07	-	0.01	1.78
Northern Europe	June-Sept	0.07	-	0.01	1.33
Southern Europe	June-Sept	0.07	-	0.01	1.78
Step 3					
D2	ditch	0.0468	Drift	0.0081	0.2125
D2	stream	0.0416	Drift	0.0065	0.1891
D3	ditch	0.0462	Drift	0.0022	0.1093
D4	pond	0.0016	Drift	0.0010	0.0155
D4	stream	0.0355	Drift	0.0001	0.0233
D5	pond	0.0016	Drift	0.0010	0.0158
D5	stream	0.0374	Drift	0.0001	0.0224
R1	pond	0.0016	Drift	0.0010	0.0237
R1	stream	0.0302	Drift	0.0004	0.2465

Scenario **FOCUS**	**Waterbody**	**Max PEC$_{sw}$ (µg/L)**	**Dominant entry route**	**21d- PEC$_{sw,twa}$ (µg/L)**	**Max PEC$_{sed}$ (µg/kg)**
R3	stream	0.0427	Drift	0.0006	0.0965

FOCUS Step 4

Table 8.9-8: Global maximum PEC_{sw} values for Lambda cyhalothrin, following single application of LABAMBA to <u>brassicas use no. 1 & 2</u> according to the central EU zone GAP according to surface water Step 4

PECsw (µg/L)a)	**Scenario**	**STEP 4 Lambda-cyhalothrin**													
Nozzle reduction	Vegetative strip (m)	None							5***	10	15****	20			
	No spray buffer (m)	5	10	15	20	30	40	50	5	10	15	20	30	40	50
None	D3 ditch*	0.0125	0.0162	0.0045	0.0035	0.0023	0.0018	0.0014	-	-	-	-	-	-	-
50 %		0.0063	0.0033	0.0023	0.0017	0.0012	0.0009	0.0007	-	-	-	-	-	-	-
75 %		0.0031	0.0017	0.0011	0.0009	0.0006	0.0004	0.0004	-	-	-	-	-	-	-
90 %		0.0013	0.0007	0.0005	0.0003	0.0002	0.0002	0.0001	-	-	-	-	-	-	-
None	D3 ditch**	0.0125	0.0066	0.0045	0.0034	0.0023	0.0018	0.0014	-	-	-	-	-	-	-
50 %		0.0062	0.0033	0.0023	0.0017	0.0012	0.0009	0.0007	-	-	-	-	-	-	-
75 %		0.0031	0.0017	0.0011	0.0009	0.0006	0.0004	0.0004	-	-	-	-	-	-	-
90 %		0.0012	0.0007	0.0005	0.0003	0.0002	0.0002	0.0001	-	-	-	-	-	-	-
None	D4 pond*	0.0014	0.0010	0.0008	0.0007	0.0005	0.0004	0.0003	-	-	-	-	-	-	-
50 %		0.0007	0.0005	0.0004	0.0003	0.0003	0.0002	-	-	-	-	-	-	-	-
75 %		0.0003	0.0002	0.0002	-	-	-	-	-	-	-	-	-	-	-
90 %		-	-	-	-	-	-	-	-	-	-	-	-	-	-
None	D4 stream*	0.0120	0.0064	0.0044	0.0033	0.0022	0.0017	0.0014	-	-	-	-	-	-	-
50 %		0.0060	0.0032	0.0022	0.0017	0.0011	0.0009	0.0007	-	-	-	-	-	-	-
75 %		0.0030	0.0016	0.0011	0.0008	0.0006	0.0003	0.0002	-	-	-	-	-	-	-
90 %		0.0012	0.0006	0.0004	0.0003	0.0002	-	-	-	-	-	-	-	-	-

PECsw (µg/L)[a)]	**Scenario**	**STEP 4 Lambda-cyhalothrin**													
Nozzle reduction	Vegetative strip (m)	None							5***	10	15****	20			
	No spray buffer (m)	5	10	15	20	30	40	50	5	10	15	20	30	40	50
None	D6 ditch*	0.0125	0.0066	0.0045	0.0034	0.0023	0.0018	0.0014	-	-	-	-	-	-	-
50 %		0.0062	0.0033	0.0023	0.0017	0.0012	0.0009	0.0007	-	-	-	-	-	-	-
75 %		0.0031	0.0017	0.0011	0.0009	0.0006	0.0004	0.0004	-	-	-	-	-	-	-
90 %		0.0012	0.0007	0.0005	0.0003	0.0002	0.0002	0.0001	-	-	-	-	-	-	-
None	R1 pond*	0.0016	0.0014	0.0014	-	-	-	-	0.0015	0.0011	0.0008	0.0007	0.0005	0.0004	0.0004
50 %		0.0014	0.0014	-	-	-	-	-	0.0009	0.0006	0.0005	0.0004	0.0003	0.0003	0.0003
75 %		0.0014	-	-	-	-	-	-	0.0009	0.0006	0.0004	0.0003	-	-	-
90 %		-	-	-	-	-	-	-	0.0009	0.0006	0.0004	-	-	-	-
None	R1 pond**	0.0017	0.0014	0.0014	0.0014	0.0014	0.0013	0.0013	0.0016	0.0011	0.0009	0.0007	0.0006	0.0005	0.0004
50 %		0.0014	0.0014	0.0013	0.0013	0.0013	0.0013	-	0.0009	0.0006	0.0005	0.0004	0.0003	0.0003	0.0003
75 %		0.0013	0.0013	0.0013	0.0013	0.0013	-	-	0.0008	0.0006	0.0004	0.0003	-	-	-
90 %		0.0013	0.0013	-	-	-	-	-	0.0008	0.0006	0.0004	-	-	-	-
None	R1 stream*	0.0112	0.0059	0.0040	0.0034	0.0034	-	-	0.0112	0.0059	0.0040	0.0031	0.0021	0.0016	0.0013
50 %		0.0056	0.0034	0.0034	0.0034	-	-	-	0.0056	0.0030	0.0020	0.0015	0.0010	0.0008	0.0008
75 %		0.0034	0.0034	0.0034	-	-	-	-	0.0028	0.0016	0.0012	0.0008	0.0008	0.0008	0.0008
90 %		0.0034	-	-	-	-	-	-	0.0022	0.0016	0.0012	0.0008	0.0008	0.0008	-
None	R1 stream**	0.0112	0.0059	0.0041	0.0031	0.0026	0.0026	-	0.0112	0.0059	0.0040	0.0031	0.0021	0.0016	0.0017
50 %		0.0056	0.0030	0.0026	0.0026	0.0026	-	-	0.0056	0.0030	0.0020	0.0015	0.0010	0.0008	0.0007
75 %		0.0028	0.0026	0.0026	0.0026	-	-	-	0.0028	0.0015	0.0010	0.0008	0.0006	0.0006	0.0006
90 %		0.0026	0.0026	-	-	-	-	-	0.0017	0.0012	0.0009	0.0006	0.0006	0.0006	0.0006

PECsw (µg/L)[a)]	**Scenario**	**STEP 4 Lambda-cyhalothrin**													
Nozzle reduction	Vegetative strip (m)	None							5***	10	15****	20			
	No spray buffer (m)	5	10	15	20	30	40	50	5	10	15	20	30	40	50
None	R2 stream*	0.0150	0.0079	0.0054	0.0041	0.0028	0.0021	0.0017	0.0150	0.0079	0.0054	0.0041	0.0028	0.0021	0.0013
50 %		0.0075	0.0040	0.0027	0.0021	0.0014	0.0010	0.0009	0.0075	0.0040	0.0027	0.0021	0.0014	0.0011	0.0008
75 %		0.0037	0.0020	0.0014	0.0010	0.0007	0.0006	0.0006	0.0037	0.0020	0.0014	0.0010	0.0007	0.0005	0.0004
90 %		0.0015	0.0008	0.0006	0.0006	0.0006	0.0006	0.0006	0.0015	0.0008	0.0005	0.0004	0.0003	0.0002	0.0002
None	R2 stream**	0.0149	0.0079	0.0054	0.0041	0.0028	0.0021	0.0017	0.0149	0.0079	0.0054	0.0041	0.0028	0.0021	0.0013
50 %		0.0075	0.0040	0.0027	0.0021	0.0014	0.0010	0.0009	0.0075	0.0040	0.0027	0.0021	0.0014	0.0011	0.0008
75 %		0.0037	0.0020	0.0014	0.0010	0.0007	0.0006	0.0006	0.0037	0.0020	0.0014	0.0010	0.0007	0.0005	0.0004
90 %		0.0015	0.0008	0.0006	0.0006	0.0006	0.0006	0.0006	0.0015	0.0008	0.0005	0.0004	0.0003	0.0002	0.0002
None	R3 stream*	0.0157	0.0083	0.0057	0.0043	0.0029	0.0023	0.0023	0.0157	0.0083	0.0057	0.0043	0.0029	0.0022	0.0017
50 %		0.0079	0.0042	0.0029	0.0023	0.0023	0.0023	0.0023	0.0079	0.0042	0.0028	0.0022	0.0015	0.0011	0.0009
75 %		0.0039	0.0023	0.0023	0.0023	0.0023	-	-	0.0039	0.0021	0.0014	0.0011	0.0007	0.0006	0.0006
90 %		0.0023	0.0023	0.0023	-	-	-	-	0.0016	0.0011	0.0008	0.0006	0.0006	0.0006	0.0006
None	R3 stream**	0.0157	0.0083	0.0057	0.0043	0.0029	0.0022	0.0019	0.0157	0.0083	0.0057	0.0043	0.0029	0.002218	0.0017
50 %		0.0078	0.0042	0.0028	0.0022	0.0019	0.0019	0.0019	0.0078	0.0042	0.0028	0.0022	0.0015	0.0011	0.0009
75 %		0.0039	0.0021	0.0019	0.0019	0.0019	0.0019	-	0.0039	0.0021	0.0014	0.0011	0.0007	0.0005	0.0005
90 %		0.0019	0.0019	0.0019	0.0019	-	-	-	0.0016	0.0009	0.0007	0.0005	0.0005	0.0005	0.0005
None	R4 stream*	0.0109	0.0058	0.0045	0.0045	-	-	-	0.0109	0.0058	0.0040	0.0030	0.0020	0.0015	0.0013
50 %		0.0055	0.0045	0.0045	-	-	-	-	0.0055	0.0029	0.0020	0.0015	0.0011	0.0011	0.0011
75 %		0.0045	0.0045	-	-	-	-	-	0.0030	0.0021	0.0016	0.0011	0.0011	0.0011	0.0011
90 %		0.0045	-	-	-	-	-	-	0.0030	0.0021	0.0016	0.0011	-	-	-

PECsw (µg/L)[a)]	**Scenario**	**STEP 4 Lambda-cyhalothrin**													
Nozzle reduction	Vegetative strip (m)	None							5***	10	15****	20			
	No spray buffer (m)	5	10	15	20	30	40	50	5	10	15	20	30	40	50
None	R4 stream**	0.0112	0.0059	0.0044	0.0044	-	-	-	0.0112	0.0059	0.0040	0.0031	0.0021	0.0011	0.0011
50 %		0.0056	0.0044	0.0044	0.0044	-	-	-	0.0056	0.0030	0.0020	0.0015	0.0011	0.0011	-
75 %		0.0044	0.0044	-	-	-	-	-	0.0029	0.0020	0.0016	0.0011	0.0011	-	-
90 %		0.0044	-	-	-	-	-	-	0.0029	0.0020	0.0016	0.0011	-	-	-

***vegetables leafy 1st**
****vegetables leafy 2nd**
*****0.4 was used for run off reduction and erosion in water and sediment according to the Austrian Environmental Agency (AGES).**
******0.7 and 0.9 was used for run off reduction and erosion respectively in water and sediment according to the Austrian Environmental Agency (AGES).**

For the CEU relevant scenarios the Applicant proposes to use as refinement Parent Kfoc of 189959 mL/g (geometric mean, n=14) and 1/n of 0.97 (arithmetic mean, n=14). The results are given in Table 8.9-9 and 8.9-10 below.

Table 8.9-9: FOCUS Step 3 PEC_{sw} and PEC_{sed} for Lambda-cyhalothrin after refinement following single application of LABAMBA to brassicas use no. 1 & 2

Scenario **FOCUS**	**Waterbody**	**Max PEC_{sw} (µg/L)**	**Dominant entry route**
D3*	ditch	0.0414	Drift
D3**	ditch	0.0412	Drift
D4*	pond	0.00143	Drift
D4*	stream	0.0295	Drift
R1*	pond	0.0014	Drift
R1**	pond	0.0015	Drift
R1*	stream	0.0008	Drift
R1**	stream	0.0006	Drift

***vegetables leafy 1st**
****vegetables leafy 2nd**

Table 8.9-10: Global maximum PEC$_{sw}$ values for Lambda cyhalothrin after refinement, following single application of LABAMBA to brassicas use no. 1 & 2 according to the central EU zone GAP according to surface water Step 4

PECsw (µg/L)[a)]	**Scenario**	**STEP 4 Lambda-cyhalothrin**													
Nozzle reduction	Vegetative strip (m)	None							5***	10	15****	20			
	No spray buffer (m)	5	10	15	20	30	40	50	5	10	15	20	30	40	50
None	D3 ditch*	0.0112	0.0060	0.0041	0.0031	0.0021	0.0016	0.0013	-	-	-	-	-	-	-
50 %		0.0056	0.0030	0.0020	0.0015	0.0010	0.0008	0.0006	-	-	-	-	-	-	-
75 %		0.0028	0.0015	0.0010	0.0008	0.0005	0.0004	0.0003	-	-	-	-	-	-	-
90 %		0.0011	0.0006	0.0004	0.0003	0.0002	0.0002	-	-	-	-	-	-	-	-
None	D3 ditch**	0.0112	0.0059	0.0040	0.0031	0.0021	0.0008	0.0013	-	-	-	-	-	-	-
50 %		0.0056	0.0030	0.0020	0.0015	0.0010	0.0010	0.0006	-	-	-	-	-	-	-
75 %		0.0028	0.0015	0.0010	0.0008	0.0005	0.0004	0.0003	-	-	-	-	-	-	-
90 %		0.0011	0.0006	0.0004	0.0003	0.0002	0.0002	-	-	-	-	-	-	-	-
None	D4 pond*	0.0012	0.0009	0.0007	0.0006	0.0005	0.0004	0.0003	-	-	-	-	-	-	-
50 %		0.0006	0.0004	0.0004	0.0003	0.0002	0.0002	-	-	-	-	-	-	-	-
75 %		0.0003	0.0002	0.0002	-	-	-	-	-	-	-	-	-	-	-
90 %		-	-	-	-	-	-	-	-	-	-	-	-	-	-
None	D4 stream*	0.0108	0.0057	0.0039	0.0030	0.0005	0.0015	0.0012	-	-	-	-	-	-	-
50 %		0.0054	0.0029	0.0019	0.0015	0.0010	0.0008	0.0006	-	-	-	-	-	-	-
75 %		0.0027	0.0014	0.0010	0.0007	0.0005	0.0004	0.0003	-	-	-	-	-	-	-
90 %		0.0011	0.0006	0.0004	0.0003	0.0002	0.0002	-	-	-	-	-	-	-	-
None	R1 pond*	0.0013	0.0009	0.0007	0.0006	0.0005	0.0004	0.0003	-	-	-	-	-	-	-
50 %		0.0006	0.0005	0.0004	0.0003	0.0002	0.0002	-	-	-	-	-	-	-	-

PECsw (µg/L)[a)]	**Scenario**	**STEP 4 Lambda-cyhalothrin**													
Nozzle reduction	Vegetative strip (m)	None							5***	10	15****	20			
	No spray buffer (m)	5	10	15	20	30	40	50	5	10	15	20	30	40	50
75 %		0.0003	0.0002	0.0002	-	-	-	-	-	-	-	-	-	-	-
90 %		-	-	-	-	-	-	-	-	-	-	-	-	-	-
None	R1 pond**	0.0013	0.0009	0.0007	0.0006	0.0005	0.0004	0.0003	-	-	-	-	-	-	-
50 %		0.0006	0.0005	0.0004	0.0003	0.0002	0.0002	-	-	-	-	-	-	-	-
75 %		0.0003	0.0002	0.0002	-	-	-	-	-	-	-	-	-	-	-
90 %		-	-	-	-	-	-	-	-	-	-	-	-	-	-
None	R1 stream*	0.0100	0.0053	0.0036	0.0028	0.0019	0.0014	0.0011	0.0100	0.0053	0.0036	0.0028	0.0019	0.0014	0.0011
50 %		0.0050	0.0027	0.0018	0.0014	0.0009	0.0007	0.0006	0.0050	0.0027	0.0018	0.0014	0.0009	0.0007	0.0006
75 %		0.0025	0.0013	0.0009	0.0007	0.0005	0.0005	0.0005	0.0025	0.0013	0.0009	0.0007	0.0005	0.0004	0.0003
90 %		0.0010	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0010	0.0005	0.0005	0.0003	0.0002	0.0001	-
None	R1 stream**	0.0100	0.0053	0.0036	0.0028	0.0019	0.0014	0.0011	0.0100	0.0053	0.0036	0.0028	0.0019	0.0014	0.0011
50 %		0.0050	0.0027	0.0018	0.0014	0.0009	0.0007	0.0006	0.0050	0.0027	0.0018	0.0014	0.0009	0.0007	0.0006
75 %		0.0025	0.0013	0.0009	0.0007	0.0005	0.0004	0.0004	0.0025	0.0013	0.0009	0.0007	0.0005	0.0004	0.0003
90 %		0.0010	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0010	0.0005	0.0005	0.0003	0.0002	0.0001	-

***vegetables leafy 1st**
****vegetables leafy 2nd**

Table 8.9-11: Global maximum PEC_{sw} values for Lambda cyhalothrin, following single application of LABAMBA to tomato use no. 3 according to the central EU zone GAP according to surface water Step 4

PEC_{sw} (µg/L)[a)]	**Scenario**	**STEP 4 Lambda-cyhalothrin**							
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*	0.0125	0.0162	0.0045	0.0035	-	-	-	-
50 %		0.0063	0.0033	0.0023	0.0017	-	-	-	-
75 %		0.0031	0.0017	0.0011	0.0009	-	-	-	-
90 %		0.0013	0.0007	0.0005	0.0003	-	-	-	-
None	D4 pond*	0.0014	0.0010	0.0008	0.0007	-	-	-	-
50 %		0.0007	0.0005	0.0004	0.0003	-	-	-	-
75 %		0.0003	0.0002	0.0002	0.0002	-	-	-	-
90 %		0.0001	-	-	-	-	-	-	-
None	D4 stream*	0.0120	0.0064	0.0044	0.0033	-	-	-	-
50 %		0.0060	0.0032	0.0022	0.0017	-	-	-	-
75 %		0.0030	0.0016	0.0011	0.0008	-	-	-	-
90 %		0.0012	0.0006	0.0004	0.0003	-	-	-	-
None	D6 ditch	0.0232	0.0123	0.0045	0.0034	-	-	-	-
50 %		0.0116	0.0033	0.0023	0.0032	-	-	-	-
75 %		0.0058	0.0016	0.0011	0.0016	-	-	-	-
90 %		0.0023	0.0007	0.0005	0.0003	-	-	-	-
None	R1 pond*	0.0016	0.0014	0.0014	0.0014	0.0015	0.0011	0.0008	0.0007

PEC$_{sw}$ (µg/L)$^{a)}$	**Scenario**	**STEP 4 Lambda-cyhalothrin**							
Nozzle reduction	Vegetative strip (m)	None				5**	10	15***	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
50 %		0.0014	0.0014	0.0014	0.0014	0.0009	0.0006	0.0005	0.0004
75 %		0.0014	0.0014	-	-	0.0009	0.0006	0.0004	0.0003
90 %		-	-	-	-	0.0009	0.0006	0.0004	-
None	R1 stream*	0.0112	0.0059	0.0040	0.0034	0.0112	0.0059	0.0040	0.0031
50 %		0.0056	0.0034	0.0034	0.0034	0.0056	0.0030	0.0020	0.0015
75 %		0.0034	0.0034	0.0034	-	0.0028	0.0016	0.0012	0.0008
90 %		0.0034	-	-	-	0.0022	0.0016	0.0012	0.0008
None	R2 stream	0.0149	0.0079	0.0054	0.0041	0.0149	0.0079	0.0054	0.0041
50 %		0.0075	0.0040	0.0027	0.0021	0.0109	0.0040	0.0027	0.0021
75 %		0.0037	0.0020	0.0014	0.0010	0.0037	0.0020	0.0014	0.0010
90 %		0.0015	0.0008	0.0008	0.0008	0.0015	0.0008	0.0005	0.0004
None	R3 stream	0.0157	0.0083	0.0057	0.0043	0.0157	0.0083	0.0057	0.0043
50 %		0.0079	0.0042	0.0028	0.0022	0.0079	0.0042	0.0028	0.0022
75 %		0.0039	0.0021	0.0017	0.0017	0.0039	0.0021	0.0014	0.0011
90 %		0.0017	0.0017	0.0017	0.0017	0.0016	0.0008	0.0006	0.0004
None	R4 stream	0.0109	0.0058	0.0045	0.0045	0.0109	0.0058	0.0039	0.0030
50 %		0.0054	0.0045	0.0045	0.0045	0.0054	0.0029	0.0048	0.0015
75 %		0.0045	0.0045	-	-	0.0029	0.0020	0.0012	0.0011
90 %		0.0045	-	-	-	0.0029	0.0020	0.0011	0.0011

***National scenarios relevant for Poland are D3, D4 and R1. Due to fact that scenarios (D3, D4 and R1) are not available for tomato in programs used**

for modelling, the surrogate crop was proposed. Presented calculation was done for vegetables leafy 1st, for scenarios D3, D4 and R1 considering all input data as for leafy vegetables 1st.
****0.4 was used for run off reduction and erosion in water and sediment according to the Austrian Environmental Agency (AGES).**
*****0.7 and 0.9 was used for used for run off reduction and erosion respectively in water and sediment according to the Austrian Environmental Agency (AGES).**

For the CEU relevant scenarios the Applicant proposes to use as refinement Parent Kfoc of 189959 mL/g (geometric mean, n=14) and 1/n of 0.97 (arithmetic mean, n=14). The results are given in Table 8.9-12 and 8.9-13 below.

Table 8.9-12: FOCUS Step 3 PEC_{sw} and PEC_{sed} for Lambda-cyhalothrin after refinement following single application of LABAMBA to tomato use no. 3

Scenario FOCUS	Waterbody	Max PEC_{sw} (µg/L)	Dominant entry route
D3*	ditch	0.0414	Drift
D4*	pond	0.00143	Drift
D4*	stream	0.0295	Drift
R1*	pond	0.0014	Drift
R1*	stream	0.0008	Drift

***National scenarios relevant for Poland are D3, D4 and R1. Due to fact that scenarios (D3, D4 and R1) are not available for tomato in programs used for modelling, the surrogate crop was proposed. Presented calculation was done for vegetables leafy 1st, for scenarios D3, D4 and R1 considering all input data as for vegetables leafy 1st.**

Table 8.9-13: Global maximum PEC_{sw} values for Lambda cyhalothrin after refinement, following single application of LABAMBA to tomato use no. 3 & 4 according to the central EU zone GAP according to surface water Step 4

PECsw (µg/L) a)	**Scenario**	**STEP 4 Lambda-cyhalothrin**							
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*	0.0112	0.0060	0.0041	0.0031	-	-	-	-
50 %		0.0056	0.0030	0.0020	0.0015	-	-	-	-
75 %		0.0028	0.0015	0.0010	0.0008	-	-	-	-
90 %		0.0011	0.0006	0.0004	0.0003	-	-	-	-
None	D4 pond*	0.0012	0.0009	0.0007	0.0006	-	-	-	-
50 %		0.0006	0.0004	0.0004	0.0003	-	-	-	-
75 %		0.0003	0.0002	0.0002	-	-	-	-	-
90 %		-	-	-	-	-	-	-	-
None	D4 stream*	0.0108	0.0057	0.0039	0.0030	-	-	-	-
50 %		0.0054	0.0029	0.0019	0.0015	-	-	-	-
75 %		0.0027	0.0014	0.0010	0.0007	-	-	-	-
90 %		0.0011	0.0006	0.0004	0.0003	-	-	-	-
None	R1 pond*	0.0013	0.0009	0.0007	0.0006	-	-	-	-
50 %		0.0006	0.0005	0.0004	0.0003	-	-	-	-
75 %		0.0003	0.0002	0.0002	-	-	-	-	-
90 %		-	-	-	-	-	-	-	-

PECsw (µg/L) a)	**Scenario**	**STEP 4 Lambda-cyhalothrin**							
Nozzle reduction	Vegetative strip (m)	None				5***	10	15****	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
None	R1 stream*	0.0100	0.0053	0.0036	0.0028	0.0100	0.0053	0.0036	0.0028
50 %		0.0050	0.0027	0.0018	0.0014	0.0050	0.0027	0.0018	0.0014
75 %		0.0025	0.0013	0.0009	0.0007	0.0025	0.0013	0.0009	0.0007
90 %		0.0010	0.0005	0.0005	0.0005	0.0010	0.0005	0.0005	0.0003

***National scenarios relevant for Poland are D3, D4 and R1. Due to fact that scenarios (D3, D4 and R1) are not available for tomato in programs used for modelling, the surrogate crop was proposed. Presented calculation was done for vegetables leafy 1st, for scenarios D3, D4 and R1 considering all input data as for leafy vegetables 1st.**
****0.7 and 0.9 was used for used for run off reduction and erosion respectively in water and sediment according to the Austrian Environmental Agency (AGES).**

Table 8.9-14: Global maximum PEC_{sw} values for Lambda cyhalothrin, following single application of LABAMBA to winter cereals use no. 5 according to the central EU zone GAP according to surface water Step 4

PEC_{SW} (µg/L)[a)]	**Scenario**	**STEP 4 Lambda-cyhalothrin**							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
None	D1 ditch	0.0127	0.0067	0.0046	0.0035	-	-	-	-
50 %		0.0063	0.0034	0.0023	0.0017	-	-	-	-
75 %		0.0032	0.0017	0.0011	0.0009	-	-	-	-
90 %		0.0013	0.0007	0.0005	0.0003	-	-	-	-
None	D1 stream	0.0148	0.0078	0.0053	0.0041	-	-	-	-
50 %		0.0074	0.0039	0.0027	0.0020	-	-	-	-
75 %		0.0037	0.0020	0.0013	0.0010	-	-	-	-
90 %		0.0015	0.0008	0.0005	0.0004	-	-	-	-
None	D2 ditch	0.0127	0.0067	0.0046	0.0035	-	-	-	-
50 %		0.0063	0.0034	0.0023	0.0017	-	-	-	-
75 %		0.0032	0.0017	0.0011	0.0009	-	-	-	-
90 %		0.0013	0.0007	0.0005	0.0003	-	-	-	-
None	D2 stream	0.0151	0.0080	0.0055	0.0042	-	-	-	-
50 %		0.0075	0.0040	0.0027	0.0021	-	-	-	-
75 %		0.0038	0.0020	0.0014	0.0010	-	-	-	-

PEC$_{sw}$ (µg/L)[a)]	**Scenario**	**STEP 4 Lambda-cyhalothrin**							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
90 %		0.0015	0.0008	0.0005	0.0004	-	-	-	-
None	D3 ditch	0.0125	0.0066	0.0045	0.0035	-	-	-	-
50 %		0.0063	0.0033	0.0023	0.0017	-	-	-	-
75 %		0.0031	0.0017	0.0011	0.0009	-	-	-	-
90 %		0.0013	0.0007	0.0005	0.0003	-	-	-	-
None	D4 pond	0.0014	0.0010	0.0008	0.0007	-	-	-	-
50 %		0.0007	0.0005	0.0004	0.0003	-	-	-	-
75 %		0.0003	0.0002	0.0002	-	-	-	-	-
90 %		-	-	-	-	-	-	-	-
None	D4 stream	0.0133	0.0070	0.0048	0.0037	-	-	-	-
50 %		0.0066	0.0035	0.0024	0.0018	-	-	-	-
75 %		0.0033	0.0018	0.0012	0.0009	-	-	-	-
90 %		0.0013	0.0007	0.0005	0.0004	-	-	-	-
None	D5 pond	0.0014	0.0010	0.0008	0.0007	-	-	-	-
50 %		0.0007	0.0005	0.0004	0.0003	-	-	-	-
75 %		0.0003	0.0002	0.0002	-	-	-	-	-

PEC$_{sw}$ (µg/L)[a)]	**Scenario**	**STEP 4 Lambda-cyhalothrin**							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
90 %		-	-		-	-	-	-	-
None	D5 stream	0.0135	0.0071	0.0049	0.0037	-	-	-	-
50 %		0.0067	0.0036	0.0024	0.0019	-	-	-	-
75 %		0.0034	0.0018	0.0012	0.0009	-	-	-	-
90 %		0.0013	0.0007	0.0005	0.0004	-	-	-	-
None	D6 ditch	0.0125	0.0066	0.0045	0.0034	-	-	-	-
50 %		0.0063	0.0033	0.0023	0.0017	-	-	-	-
75 %		0.0031	0.0017	0.0011	0.0009	-	-	-	-
90 %		0.0013	0.0007	0.0005	0.0003	-	-	-	-
None	R1 pond	0.0014	0.0010	0.0008	0.0007	0.0014	0.0010	0.0008	0.0007
50 %		0.0007	0.0006	0.0005	0.0005	0.0007	0.0005	0.0004	0.0003
75 %		0.0005	0.0005	0.0005	0.0005	0.0004	0.0003	0.0003	-
90 %		0.0005	0.0005	0.0004	0.0004	0.0003	-	-	-
None	R1 stream	0.0111	0.0059	0.0040	0.0032	0.0111	0.0059	0.0040	0.0031
50 %		0.0055	0.0032	0.0032	0.0032	0.0055	0.0029	0.0020	0.0015
75 %		0.0032	0.0032	0.0032	0.0032	0.0028	0.0015	0.0011	0.0008

PEC$_{sw}$ (µg/L)[a)]	**Scenario**	**STEP 4 Lambda-cyhalothrin**							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
90 %		0.0032	0.0032	0.0032	0.0032	0.0021	0.0015	0.0011	0.0008
None	R3 stream	0.0157	0.0083	0.0057	0.0043	0.0157	0.0083	0.0057	0.0043
50 %		0.0078	0.0042	0.0028	0.0024	0.0078	0.0042	0.0028	0.0022
75 %		0.0039	0.0024	0.0024	0.0024	0.0039	0.0021	0.0014	0.0011
90 %		0.0024	0.0024	0.0024	0.0024	0.0016	0.0011	0.0008	0.0006
None	R4 stream	0.0111	0.0059	0.0041	0.0041	0.0111	0.0059	0.0040	0.0031
50 %		0.0056	0.0041	0.0041	0.0041	0.0056	0.0029	0.0020	0.0015
75 %		0.0041	0.0041	0.0041	0.0041	0.0028	0.0019	0.0014	0.0010
90 %		0.0041	0.0041	0.0041	0.0041	0.0027	0.0019	0.0014	0.0010

***0.4 was used for run off reduction and erosion in water and sediment according to the Austrian Environmental Agency (AGES).**
****0.7 and 0.9 was used for used for run off reduction and erosion respectively in water and sediment according to the Austrian Environmental Agency (AGES).**

For the CEU relevant scenarios the Applicant proposes to use as refinement Parent Kfoc of 189959 mL/g (geometric mean, n=14) and 1/n of 0.97 (arithmetic mean, n=14). The results are given in Table 8.9-15 and 8.9-16 below.

Table 8.9-15: FOCUS Step 3 PEC_{sw} and PEC_{sed} for Lambda-cyhalothrin after refinement following single application of LABAMBA to winter cereals use no. 5

Scenario FOCUS	Waterbody	Max PEC_{sw} (µg/L)	Dominant entry route
D3	ditch	0.0414	Drift
D4	pond	0.0014	Drift
D4	stream	0.0325	Drift
R1	pond	0.0014	Drift
R1	stream	0.0272	Drift

Table 8.9-16: Global maximum PEC_{sw} values for Lambda cyhalothrin after refinement, following single application of LABAMBA to winter cereals use no. 5 according to the central EU zone GAP according to surface water Step 4

PEC_{sw} (µg/L)[a)]	Scenario	STEP 4 Lambda-cyhalothrin							
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	0.0112	0.0060	0.0041	0.0031	-	-	-	-
50 %		0.0056	0.0030	0.0020	0.0015	-	-	-	-
75 %		0.0028	0.0015	0.0010	0.0008	-	-	-	-
90 %		0.0011	0.0006	0.0004	0.0003	-	-	-	-
None	D4 pond	0.0012	0.0009	0.0007	0.0006	-	-	-	-
50 %		0.0006	0.0004	0.0004	0.0003	-	-	-	-

PEC_{sw} (µg/L)[a)]	**Scenario**	**STEP 4 Lambda-cyhalothrin**							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
75 %		0.0003	0.0002	0.0002	-	-	-	-	-
90 %		-	-	-	-	-	-	-	-
None	D4 stream	0.0119	0.0063	0.0043	0.0033	-	-	-	-
50 %		0.0059	0.0032	0.0022	0.0016	-	-	-	-
75 %		0.0030	0.0016	0.0011	0.0008	-	-	-	-
90 %		0.0012	0.0006	0.0004	0.0003	-	-	-	-
None	R1 pond	0.0012	0.0009	0.0007	0.0006	-	-	-	-
50 %		0.0006	0.0004	0.0004	0.0003	-	-	-	-
75 %		0.0003	0.0002	0.0002	-	-	-	-	-
90 %		-	-	-	-	-	-	-	-
None	R1 stream	0.0099	0.0053	0.0036	0.0027	0.0099	0.0053	0.0036	0.0027
50 %		0.0050	0.0026	0.0018	0.0014	0.0050	0.0026	0.0018	0.0014
75 %		0.0025	0.0013	0.0009	0.0007	0.0025	0.0013	0.0009	0.0007
90 %		0.0010	0.0005	0.0005	0.0005	0.0010	0.0005	0.0004	0.0003

Table 8.9-17: Global maximum PEC_{sw} values for Lambda cyhalothrin, following single application of LABAMBA to winter oilseed rape use no. 6, 7, 8 & 9 to the central EU zone GAP according to surface water Step 4

PEC_{sw} (µg/L)[a)]	**Scenario**	**STEP 4 Lambda-cyhalothrin**							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15*	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
None	D2 ditch	0.0127	0.0067	0.0046	0.0035	-	-	-	-
50 %		0.0063	0.0034	0.0023	0.0017	-	-	-	-
75 %		0.0017	0.0076	0.0011	0.0009	-	-	-	-
90 %		0.0013	0.0007	0.0005	0.0003	-	-	-	-
None	D2 stream	0.0152	0.0081	0.0055	0.0042	-	-	-	-
50 %		0.0076	0.0040	0.0028	0.0021	-	-	-	-
75 %		0.0020	0.0020	0.0014	0.0010	-	-	-	-
90 %		0.0015	0.0008	0.0006	0.0004	-	-	-	-
None	D3 ditch	0.0125	0.0066	0.0045	0.0035	-	-	-	-
50 %		0.0063	0.0033	0.0023	0.0017	-	-	-	-
75 %		0.0017	0.0017	0.0011	0.0009	-	-	-	-
90 %		0.0013	0.0007	0.0005	0.0003	-	-	-	-
None	D4 pond	0.0014	0.0010	0.0008	0.0007	-	-	-	-
50 %		0.0007	0.0005	0.0004	0.0003	-	-	-	-
75 %		0.0002	0.0002	0.0002	-	-	-	-	-
90 %		-	-	-	-	-	-	-	-
None	D4 stream	0.0130	0.0069	0.0047	0.0036	-	-	-	-
50 %		0.0065	0.0034	0.0023	0.0018	-	-	-	-

PEC$_{SW}$ (µg/L)[a)]	**Scenario**	**STEP 4 Lambda-cyhalothrin**							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15*	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
75 %		0.0017	0.0017	0.0012	0.0009	-	-	-	-
90 %		0.0013	0.0007	0.0005	0.0004	-	-	-	-
None	D5 pond	0.0014	0.0010	0.0008	0.0007	-	-	-	-
50 %		0.0007	0.0005	0.0004	0.0003	-	-	-	-
75 %		0.0002	0.0002	0.0002	-	-	-	-	-
90 %		-	-	-	-	-	-	-	-
None	D5 stream	0.0137	0.0073	0.0050	0.0038	-	-	-	-
50 %		0.0068	0.0036	0.0025	0.0019	-	-	-	-
75 %		0.0018	0.0018	0.0012	0.0009	-	-	-	-
90 %		0.0014	0.0007	0.0005	0.0004	-	-	-	-
None	R1 pond	0.0014	0.0010	0.0008	0.0007	0.0014	0.0010	0.0008	0.0007
50 %		0.0007	0.0006	0.0006	0.0005	0.0007	0.0005	0.0004	0.0003
75 %		0.0005	0.0005	0.0005	0.0005	0.0004	0.0003	0.0002	-
90 %		0.0005	0.0005	0.0005	-	0.0004	-	-	-
None	R1 stream	0.0110	0.0058	0.0040	0.0033	0.0110	0.0058	0.0040	0.0030
50 %		0.0055	0.0033	0.0033	0.0033	0.0055	0.0029	0.0020	0.0015
75 %		0.0033	0.0033	0.0033	-	0.0028	0.0015	0.0011	0.0008
90 %		0.0033	-	-	-	0.0028	0.0015	0.0011	0.0008
None	R3 stream	0.0156	0.0083	0.0056	0.0043	0.0156	0.0083	0.0056	0.0043
50 %		0.0078	0.0041	0.0028	0.0020	0.0078	0.0041	0.0028	0.0021

PEC_{sw} (µg/L)[a)]	**Scenario**	**STEP 4 Lambda-cyhalothrin**							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15*	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
75 %		0.0023	0.0023	0.0023	0.0023	0.0039	0.0021	0.0014	0.0011
90 %		0.0023	0.0023	0.0023	0.0023	0.0039	0.0010	0.0008	0.0005

***0.4 was used for run off reduction and erosion in water and sediment according to the Austrian Environmental Agency (AGES).**
***0.7 and 0.9 was used for run off reduction and erosion respectively in water and sediment according to the Austrian Environmental Agency (AGES).**

For the CEU relevant scenarios the Applicant proposes to use as refinement Parent Kfoc of 189959 mL/g (geometric mean, n=14) and 1/n of 0.97 (arithmetic mean, n=14). The results are given in Table 8.9-18 and 8.9-19 below.

Table 8.9-18: FOCUS Step 3 PEC_{sw} and PEC_{sed} for Lambda-cyhalothrin after refinement following single application of LABAMBA to <u>winter oilseed rape use no. 6, 7, 8 & 9</u>

Scenario FOCUS	**Waterbody**	**Max PEC_{sw} (µg/L)**	**Dominant entry route**
D3	ditch	0.0414	Drift
D4	pond	0.0014	Drift
D4	stream	0.0317	Drift
R1	pond	0.0014	Drift
R1	stream	0.0270	Drift

Table 8.9-19: Global maximum PEC_{sw} values for Lambda cyhalothrin after refinement, following single application of LABAMBA to winter oilseed rape use no. 6, 7, 8, 9to the central EU zone GAP according to surface water Step 4

PEC_{sw} (µg/L)[a)]	**Scenario**	**STEP 4 Lambda-cyhalothrin**							
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	0.0112	0.0060	0.0041	0.0031	-	-	-	-
50 %		0.0020	0.0030	0.0020	0.0015	-	-	-	-
75 %		0.0028	0.0015	0.0010	0.0008	-	-	-	-
90 %		0.0011	0.0006	0.0004	0.0003	-	-	-	-
None	D4 pond	0.0012	0.0009	0.0007	0.0006	-	-	-	-
50 %		0.0004	0.0004	0.0004	0.0003	-	-	-	-
75 %		0.0003	0.0002	0.0002	-	-	-	-	-
90 %		-	-	-	-	-	-	-	-
None	D4 stream	0.0116	0.0062	0.0042	0.0032	-	-	-	-
50 %		0.0021	0.0031	0.0021	0.0016	-	-	-	-
75 %		0.0029	0.0015	0.0011	0.0008	-	-	-	-
90 %		0.0012	0.0006	0.0004	0.0003	-	-	-	-
None	R1 pond	0.0012	0.0009	0.0007	0.0006	-	-	-	-
50 %		0.0004	0.0004	0.0004	0.0003	-	-	-	-
75 %		0.0003	0.0002	0.0002	-	-	-	-	-
90 %		-	-	-	-	-	-	-	-
None	R1 stream	0.0099	0.0052	0.0036	0.0027	0.0099	0.0052	0.0036	0.0027

PEC$_{sw}$ (µg/L)[a)]	**Scenario**	**STEP 4 Lambda-cyhalothrin**							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
50 %		0.0018	0.0026	0.0018	0.0014	0.0049	0.0026	0.0009	0.0014
75 %		0.0025	0.0013	0.0009	0.0007	0.0025	0.0013	0.0009	0.0007
90 %		0.0010	0.0005	0.0005	0.0005	0.0010	0.0005	0.0004	0.0003

Metabolites of Lambda-cyhalothrin

Table 8.9-20: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for metabolite Ia following single application of LABAMBA to brassicas use no. 1 & 2, tomato use no. 3 & 4 and winter cereals use no. 5

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	-	0.45	0.09
Step 2					
Northern Europe	March-May	0.05	-	0.05	0.01
Southern Europe	March-May	0.08	-	0.08	0.01

Table 8.9-21: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for metabolite Ia following single application of LABAMBA to winter oilseed rape use no. 6, 7, 8 & 9

Scenario FOCUS	Waterbody	Max PEC_{sw} (µg/L)	Dominant entry route	21d- $PEC_{sw,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
Step 1	---	0.07	-	0.45	0.09
Step 2					
Northern Europe	Mar-May	0.04	-	0.04	0.01
Southern Europe	Mar-May	0.07	-	0.07	0.01

Table 8.9-22: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for metabolite V (PBA) following single application of LABAMBA to brassicas use no. 1 & 2, tomato use no. 3 & 4 and winter cereals use no. 5

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	-	0.36	0.89
Step 2					
Northern Europe	March-May	0.04	-	0.04	0.06
Southern Europe	March-May	0.07	-	0.07	0.11

Table 8.9-23: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for metabolite V (PBA) following single application of LABAMBA to winter oilseed rape use no. 6, 7, 8 & 9

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	-	0.36	0.57
Step 2					
Northern Europe	Mar-May	0.03	-	0.03	0.05
Southern Europe	Mar-May	0.06	-	0.06	0.09

Table 8.9-24: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for metabolite XV following single application of LABAMBA to brassicas use no. 1 & 2

Scenario FOCUS	Waterbody	Max PEC_{sw} (µg/L)	Dominant entry route	21d- $PEC_{sw,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
Step 1	---	<0.01	-	<0.01	2.26
Step 2					
Northern Europe	March-May	<0.01	-	<0.01	0.12
Southern Europe	March-May	<0.01	-	<0.01	0.23
Step 3					
D3*	ditch	0.000001	Drift	0.000001	0.000007
D3**	ditch	<1e-6	Drift	<1e-6	0.000003
D4*	pond	<1e-6	Drift	<1e-6	0.000039
D4*	stream	0.000002	Drift	0.000670	<1e-6
D6*	ditch	< 1e-6	Drift	< 1e-6	0.000004
R1*	pond	0.000002	Drift	0.000002	0.000137
R1**	pond	0.000002	Drift	0.000002	0.000134
R1*	stream	< 1e-6	Drift	< 1e-6	0.000003
R1**	stream	< 1e-6	Drift	< 1e-6	0.000003
R2*	stream	0.000001	Drift	< 1e-6	0.000001
R2**	stream	0.000001	Drift	< 1e-6	0.000001
R3*	stream	0.000004	Drift	< 1e-6	0.000011
R3**	stream	0.000004	Drift	< 1e-6	0.000011
R4*	stream	0.000002	Drift	< 1e-6	0.000011
R4**	stream	0.000002	Drift	< 1e-6	0.000012

***vegetables leafy 1st**
****vegetables leafy 2nd**

Table 8.9-29: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for metabolite XV following single application of LABAMBA to tomato use no. 3 & 4

Scenario FOCUS	Waterbody	Max PEC_{sw} (µg/L)	Dominant entry route	21d- $PEC_{sw,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
Step 1	---	<0.01	-	<0.01	2.26
Step 2					
Northern Europe	March-May	<0.01	-	<0.01	0.12
Southern Europe	March-May	<0.01	-	<0.01	0.23
Step 3					
D3*	ditch	0.000001	Drift	0.000001	0.000007
D4*	stream	0.000002	Drift	0.000670	<1e-6
D4*	stream	0.000002	Drift	0.000670	<1e-6
D6	ditch	< 1e-6	Drift	< 1e-6	0.000003
R1*	stream	< 1e-6	Drift	< 1e-6	0.000003
R2	stream	0.000001	Drift	< 1e-6	0.000001
R3	stream	0.000004	Drift	< 1e-6	0.000011
R4	stream	0.000002	Drift	< 1e-6	0.000010

***National scenarios relevant for Poland are D3, D4 and R1. Due to fact that scenarios (D3, D4 and R1) are not available for tomato in programs used for modelling, the surrogate crop was proposed. Presented calculation was done for vegetables leafy 1st, for scenarios D3, D4 and R1 considering all input data as for vegetables leafy 1st.**

Table 8.9-30: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for metabolite XV following single application of LABAMBA to winter cereals use no. 5

Scenario FOCUS	Waterbody	Max PEC_{sw} (µg/L)	Dominant entry route	21d- $PEC_{sw,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
Step 1	---	<0.01	-	<0.01	2.26
Step 2					
Northern Europe	Mar-May	<0.01	-	<0.01	0.12
Southern Europe	Mar-May	<0.01	-	<0.01	0.23
Step 3					
D1	ditch	0.000003	Drift	0.000003	0.2155
D1	stream	0.000005	Drift	< 1e-6	0.000013
D2	ditch	0.000003	Drift	< 1e-6	0.000031
D2	stream	0.000023	Drift	0.000004	0.000152
D3	ditch	0.000001	Drift	< 1e-6	0.000007
D4	pond	< 1e-6	Drift	< 1e-6	0.000045

Scenario FOCUS	**Waterbody**	**Max PEC_{sw} (µg/L)**	**Dominant entry route**	**21d- $PEC_{sw,twa}$ (µg/L)**	**Max PEC_{sed} (µg/kg)**
D4	stream	0.000002	Drift	< 1e-6	0.000002
D5	pond	< 1e-6	Drift	< 1e-6	0.000053
D5	stream	0.000003	Drift	< 1e-6	0.000002
D6	ditch	< 1e-6	Drift	< 1e-6	0.000004
R1	pond	0.000001	Drift	0.000001	0.000080
R1	stream	< 1e-6	Drift	< 1e-6	0.000003
R3	stream	0.000004	Drift	< 1e-6	0.000010
R4	stream	0.000002	Drift	< 1e-6	0.000009

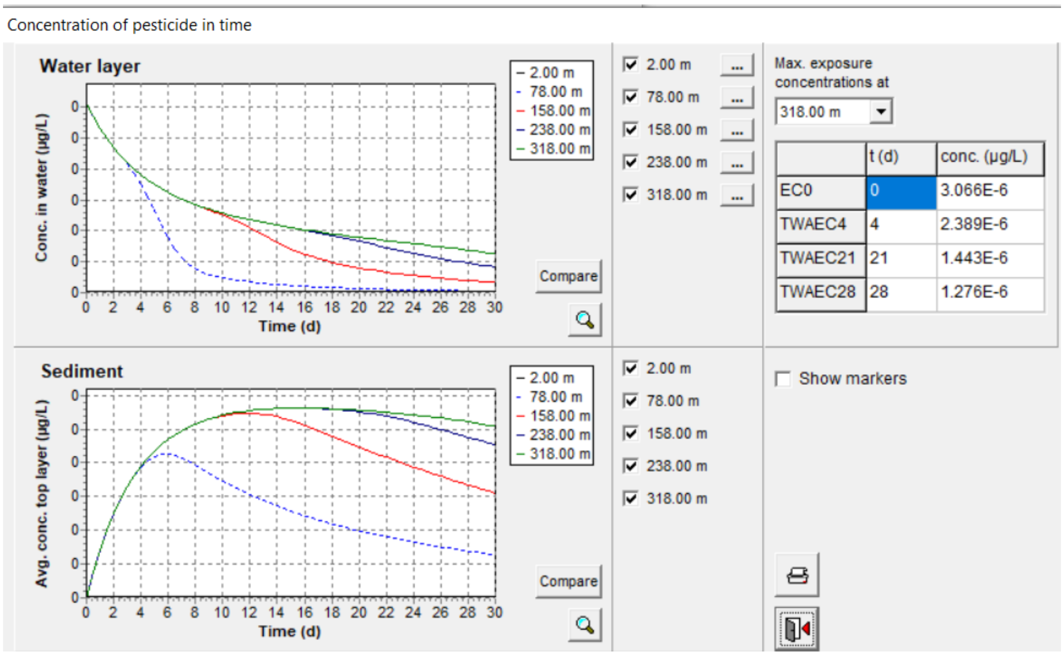
Table 8.9-31: **FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for metabolite XV following single application of LABAMBA to winter oilseed rape use no. 6, 7, 8 & 9**

Scenario FOCUS	**Waterbody**	**Max PEC_{sw} (µg/L)**	**Dominant entry route**	**21d- $PEC_{sw,twa}$ (µg/L)**	**Max PEC_{sed} (µg/kg)**
Step 1	---	<0.01	-	<0.01	2.26
Step 2					
Northern Europe	Mar-May	<0.01	-	<0.01	0.10
Southern Europe	Mar-May	<0.01	-	<0.01	0.20
Step 3					
D2	ditch	0.000003	Drift	< 1e-6	0.000037
D2	stream	0.000023	Drift	0.000004	0.000154
D3	ditch	< 1e-6	Drift	< 1e-6	0.000003
D4	pond	< 1e-6	Drift	< 1e-6	0.000044
D4	stream	0.000002	Drift	< 1e-6	0.000001
D5	pond	< 1e-6	Drift	< 1e-6	0.000053
D5	stream	0.000003	Drift	< 1e-6	0.000002
R1	pond	0.000001	Drift	0.000001	0.000076
R1	stream	< 1e-6	Drift	< 1e-6	0.000003
R3	stream	0.000004	Drift	< 1e-6	0.000008

PEC$_{sw}$ and PEC$_{sed}$ for tomato crop in greenhouse

As tomato is a soil bound crop since it is a permanent crop and due to a bug in GEM v3.3.2 for soil bound crops the PEC's have been calculated using TOXSWA v1.2.

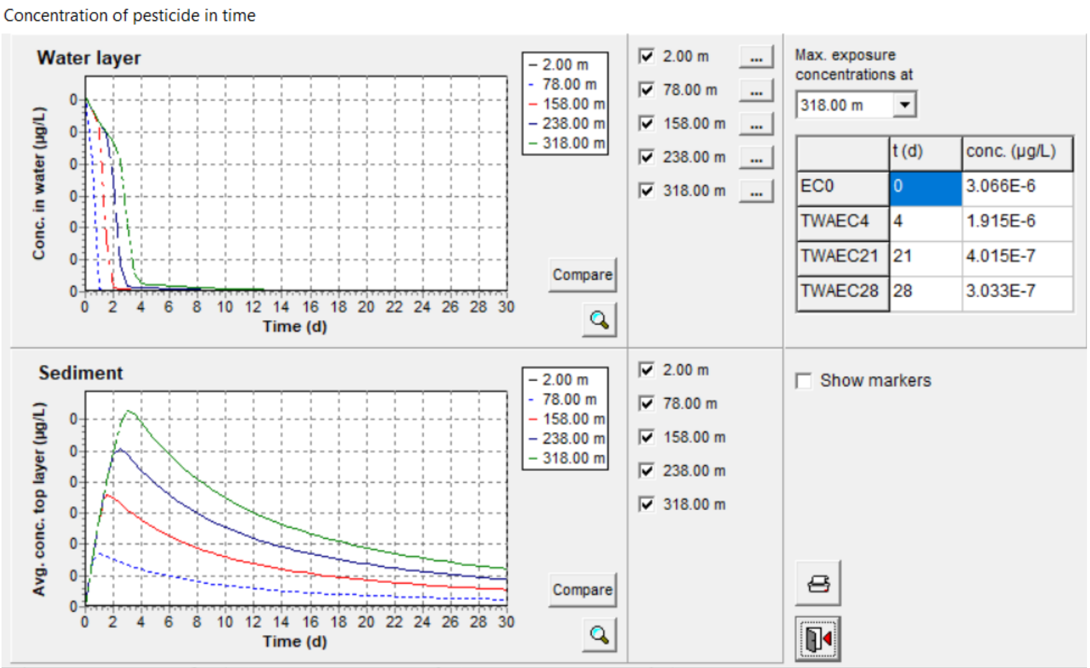
Figure 8.9-48: PEC$_{sw}$ for Lambda-cyhalothrin (DT$_{50\ water}$ 1000 d) following <u>single</u> application of LABAMBA in greenhouse for tomato use no. 4 with TOXSWA v1.2, NL standard – Spring scenario



	t (d)	conc. (µg/L)
EC0	0	3.066E-6
TWAEC4	4	2.389E-6
TWAEC21	21	1.443E-6
TWAEC28	28	1.276E-6

Max PECsed 0.00013 µg/kg, corresponding to 0.0001 µg/L, based on sediment density 1.3 kg/L.

Figure 8.9-50: PEC$_{sw}$ for Lambda-cyhalothrin (DT$_{50\ water}$ 1000 d) following <u>single</u> application of LABAMBA in greenhouse for tomato use no. 4 with TOXSWA v1.2 NL standard – Autumn scenario



	t (d)	conc. (µg/L)
EC0	0	3.066E-6
TWAEC4	4	1.915E-6
TWAEC21	21	4.015E-7
TWAEC28	28	3.033E-7

Max PECsed <0.00013 µg/kg, corresponding to <0.0001 µg/L, based on sediment density 1. 3 kg/L.

8.9.2.2 $PEC_{sw/sed}$ of LABAMBA

The PEC_{sw} for LABAMBA 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 LABAMBA is 1 x 0.075 L/ha (corresponding to 1 x 76.52 g fp/ha, based on the density value of 1.0203 g/mL) for all uses.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 8.9-51.

Table 8.9-51: PEC_{sw} and for LABAMBA following single application to all crops

Crop	Distance (m)	Drift (%)	Max $PEC_{s/w}$ (µg/L)
All crops	3	2.77	0.71

The PEC_{sed} calculation is in agreement with the Env_Fate_Multiple_application_pec_calculator Excel™ spreadsheet:

$$PEC_{sed}\,(\mu g/kg\ dw) = \frac{\%Drift\ _{90^{th}\%ile} \times Application\ rate\ (g/ha) \times \%\ of\ Lambda\text{-}cyhalothrin\ in\ sediment}{1000 \times Sediment\ density\ (g/cm3) \times Sediment\ height\ (cm)}$$

Where:

% of Lambda-cyhalothrin in sediment = 78.2. But in the product the % is a 10% so the actual percentage in sediment is 78.2 x 0.1 = 7.82%
Sediment density = 1.3 g/cm^3
Sediment height = 5 cm

The application of LABAMBA is 1 x 0.075 L/ha (corresponding to 1 x 76.52 g fp/ha, based on the density value of 1.0203 g/mL) for all crops. The resulting maximum instantaneous PEC_{sed} value is presented in the Table 8.9-52.

Table 8.9-52: PEC_{sed} and for LABAMBA following single application to all crops

Crop	Distance (m)	Drift (%)	% In sediment	Max PEC_{sed} (µg/kg)
All crops	3	2.77	7.82	0.26

zRMS: comments:

The input parameters considered by Applicant in surface water modelling for lambda- cyhalothrin and its metabolites used for surface water calculation were established in the EU reviews (EFSA Journal 2014;12(5):3677).

Interception is appropriate to the proposed BBCH of crops (EFSA guidance was published, (2014;12(5):3662).
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. The geomean of the DT_{50} and K_{foc} values were used in modelling.
Use as refinement K_{foc} of 189 959 mL/g (geometric mean, n=14) instead 38 000 mL/g (worst case) for lambda-cyhalothrin was accepted by RMS.
Predicted environmental concentrations of lambda-cyhalothrin and metabolite XV in surface water and sediment were calculated at FOCUS Step 1&2 and 3. The drift has been determined as dominant entry route. Step 4 simulations were performed in line with recommendations of the FOCUS work group on landscape and mitigation factors (2007).
FOCUS Step 4 calculations were also conducted for lambda-cyhalothrin by reducing spray drift deposition and by reduction runoff by buffer zones (vegetated filter strips). For some application patterns spray drift deposition was also further refined using of drift reduction technology (DRT). The Step 4 calculations were performed using the SWAN tool (version 5.0.0). In accordance with FOCUS guidance, the Steps 3 and 4 simulations were performed based on single application and the highest PEC_{sw} and PEC_{sed} values were selected for input into the environmental risk as-

sessment.

For PECsw/sed calculations at STEP 4, the values used for reduction in run off volume and flux and according to the Austrian Environmental Agency (AGES) for 15 meters of vegetative buffer strip should be considered at national level.

The PEC_{sw} and PEC_{sed} for tomato crop in greenhouse was accepted.

PL: National scenarios relevant for Poland are D3, D4 and R1. Due to fact that scenarios (D3, D4 and R1) are not available for tomato, strawberry in programs used for modelling, the surrogate crops was used and accepted by RMS.

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

Table 8.10-1: Summary of atmospheric degradation and behaviour of Lambda cyhalothrin

Compound	Lambda cyhalothrin
Direct photolysis in air	No data submitted nor required
Quantum yield of direct phototransformation	No data submitted nor required
Photochemical oxidative degradation in air	DT50 (h): 12.2 hours (assuming global average OH-conc over 24 hours of 0.5 x 106 mol/cm3)
Volatilisation	Vapour pressure (Pa): $2x10^{-7}$ (20°C) Henry's Law Constant (Pa.m3/mol): 0.02 at 20°C
Metabolites	none

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

zRMS comments:

Provided above information is in line with EU agreed data reported in EU Review; Report EFSA 2014.

Appendix 1 Lists of data considered in support of the evaluation

Appendix 2 Detailed evaluation of the new Annex II studies

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