REGISTRATION REPORT

Part B

Section 8

Environmental Fate

Detailed summary of the risk assessment

Product code: EF-243

Product name(s): Lontrel 300

Chemical active substance:

Clopyralid-olamine, 395 g/l (300 g ae/l)

Central Zone

Zonal Rapporteur Member State: Poland

CORE ASSESSMENT

(Renewal of Authorization under Art.43)

Applicant: Corteva Agriscience

Submission date: 22/12/2021

MS Finalisation date: 05/12/2022

After commenting: 22/02/2023

Version history

When	What
December 2021	Article 43 submission for re-registration of EF-243 following Clopyralid Renewal of approval (Commission Implementing Regulation (EU) 2021/1191)
December 2022	First zRMS assessment
February 2023	After commenting

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8 Fate and behaviour in the environment (KCP 9)

zRMS comments:

The dRR was prepared by applicant. 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. New calculations of PECgw are presented in yellow.

8.1 Critical GAP and overall conclusions

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

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Use-No. *	Member state(s)	Crop and/or situation (crop destination / purpose of crop)	F, Fn, Fpn G, Gn, Gpn or I **	Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)	**Application**				**Application rate**			PHI (days)	Remarks: 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	Poland	Sugar beet, EPPO Code: BEAVC, BEAVA, BEAVD EU MRL Code: 0213010, 0900010,	F	Broad-leaved weeds (BBBBB) (including but not only Cirsium arvense, Matricaria spp.)	Broadcast, Foliar Tractor mounted boom	BBCH 12-39 (until July 1st)	a) 1 b) 1	NA	a) 0,3 to 0,4 b) 03 to 0,4	a) AS1: 118,578 to 158,104 (as/ha), 90 to 120 (ae/ha) b) AS1: 118,578	100-400	42 days	One application every two years. Maximum total dose rate must not exceed 120 g ae clopyralid/ha	**acceptable with biennial application**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		0213010 Raw Human consumption Processed goods Cattle consumption								to 158,104 (as/ha), 90 to 120 (ae/ha)			per crop; maximum individual dose: 120 g ae clopyralid/ha. For residue management in crop rotation: no mitigation measures are required for Leafy and Brassica vegetables or for Oilseeds. For all other food and feed commodities except sugar canes, a 30-day PBI is supported. It is recommended that sugar canes not be planted for 125 days after application of clopyralid. For crop rotation management, see label for recommendations.	
2	Poland	Sugar beet, EPPO Code: BEAVC, BEAVA, BEAVD EU MRL Code: 0213010,	F	Broad-leaved weeds (BBBBB) (including but not only Cirsium arvense, Matricaria spp.)	Broadcast, Foliar Tractor mounted boom, split application	BBCH 12-15 First application at BBCH 12-15. Second application	a) 2 b) 2	7 day interval	a) 0,2 b) 0,4	a) AS1: 79,052 (as/ha), 60 (ae/ha) b) AS1: 158,104	100-400	42 days	Only every three years. Split application: First application at 60 gae clopyralid/ha (0,2L	**acceptable with biennial application**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		0900010, 0213010 Raw Human consumption Processed goods Cattle consumption				at BBCH 12-15.				(as/ha), 120 (ae/ha)			of EF-243/ha) at BBCH 12-15 followed 7-days later by a second application at BBCH 12-15 at 60 gae clopyralid/ha (0,2 L EF-243/ha). Maximum total dose rate must not exceed 120 g ae clopyralid/ha per crop; maximum individual dose: 120 g ae clopyralid/ha. For residue management in crop rotation: no mitigation measures are required for Leafy and Brassica vegetables or for Oilseeds. For all other food and feed commodities except sugar canes, a 30-day PBI is supported. It is recommended that sugar canes not be planted for	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
													125 days after application of clopyralid. For crop rotation management, see label for recommendations..	
3	Czech Republic, Slovakia	Fodder beet, Sugar beet, EPPO Code: BEAVC, BEAVD, BEAVA, EU MRL Code: 0213010, 0213010, 0900010, 0213010 Raw Human consumption Processed goods Cattle consumption	F	Broad-leaved weeds (BBBBB) (including but not only Cirsium arvense, Matricaria spp.)	Broadcast, Foliar Tractor mounted boom	BBCH 12-39 (until July 1st)	a) 1 b) 1	NA	a) 0,35 b) 0,35	a) AS1: 138,341 (as/ha), 105 (ae/ha) b) AS1: 138,341 (as/ha), 105 (ae/ha)	100-400	42 days	One application every two years. Maximum total dose rate must not exceed 105 g ae clopyralid/ha per crop; maximum individual dose: 105 g ae clopyralid/ha. For residue management in crop rotation: no mitigation measures are required for Leafy and Brassica vegetables or for Oilseeds. For all other food and feed commodities except sugar canes, a 30-day PBI is supported. It is recommended that sugar canes not be	**acceptable with biennial application**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
													planted for 125 days after application of clopyralid. For crop rotation management, see label for recommendations.	
4	Czech Republic, Slovakia, Poland	Fodder beet*, Sugar beet, EPPO Code: BEAVC, BEAVD, BEAVA, BEAVC EU MRL Code: 0213010, 0213010, 0900010, 0213010 Raw Human consumption Processed goods Cattle consumption	F	Broad-leaved weeds (BBBBB) (including but not only Cirsium arvense, Matricaria spp.)	Broadcast, Foliar Tractor mounted boom, split application	BBCH 12-15 First application at BBCH 12-15. Second application at BBCH 12-15.	a) 2 b) 2	7 day interval	a) 0,175 b) 0,35	a) AS1: 69,17 (as/ha), 52,5 (ae/ha) b) AS1: 138,341 (as/ha), 105 (ae/ha)	100-400	42 days	*Fodder beet not supported in Poland Only every three years. Split application: First application at 52,5 gae clopyralid/ha (0,175L of EF-243/ha) at BBCH 12-15 followed 7-days later by a second application at BBCH 12-15 at 52,5 gae clopyralid/ha (0,175 L EF-243/ha). Maximum total dose rate must not exceed 105 g ae clopyralid/ha per crop; maximum individual dose: 105 g ae clopyralid/ha. For residue	**acceptable with biennial application**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
													management in crop rotation: no mitigation measures are required for Leafy and Brassica vegetables or for Oilseeds. For all other food and feed commodities except sugar canes, a 30-day PBI is supported. It is recommended that sugar canes not be planted for 125 days after application of clopyralid. For crop rotation management, see label for recommendations..	
5	Czech Republic, Slovakia, Poland	Fodder beet*, Sugar beet, EPPO Code: BEAVC, BEAVD, BEAVA, BEAVC EU MRL Code: 0213010, 0213010, 0900010, 0213010	F	Broad-leaved weeds (BBBBB) (including but not only Cirsium arvense, Matricaria spp.)	Broadcast, Foliar Tractor mounted boom, split application	BBCH 15-31 First application at BBCH 15. Second application at BBCH 31.	a) 2 b) 2	10-day interval	a) 0,175 b) 0,35	a) AS1: 69,17 (as/ha), 52,5 (ae/ha) b) AS1: 138,341 (as/ha), 105 (ae/ha)	100-400	42 days	*Fodder beet not supported in Poland Every two years. Split application: first application at 52,5 gae clopyralid/ha (0,175L EF243/ha) at BBCH 15 followed 10 days	**acceptable with biennial application**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Raw Human consumption Processed goods Cattle consumption											later by a second application (at BBCH 31) at 52,5 gae clopyralid/ha (0,175 L EF-243/ha). Maximum total dose rate must not exceed 105 g ae clopyralid/ha per crop; maximum individual dose: 105 g ae clopyralid/ha. For residue management in crop rotation: no mitigation measures are required for Leafy and Brassica vegetables or for Oilseeds. For all other food and feed commodities except sugar canes, a 30-day PBI is supported. It is recommended that sugar canes not be planted for 125 days after application of clopyralid. For crop	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
													rotation management, see label for recommendations..	
6	Poland	Sugar beet, EPPO Code: BEAVC, BEAVA, BEAVD EU MRL Code: 0213010, 0900010, 0213010 Raw Human consumption Processed goods Cattle consumption	F	Broad-leaved weeds (BBBBB) (including but not only Cirsium arvense, Matricaria spp.)	Broadcast, Foliar Tractor mounted boom, split application	BBCH 15-31 First application at BBCH 15. Second application at BBCH 31.	a) 2 b) 2	10-day interval	a) 0,2 b) 0,4	a) AS1: 79,05 (as/ha), 60 (ae/ha) b) AS1: 158,1 (as/ha), 120(ae/ha)	100-400	42 days	Every two years. Split application: first application at 60 gae clopyralid/ha (0,2 L EF243/ha) at BBCH 15 followed 10 days later by a second application (at BBCH 31) at 60 gae clopyralid/ha (0,2 L EF-243/ha). Maximum total dose rate must not exceed 120 g ae clopyralid/ha per crop; maximum individual dose: 120 g ae clopyralid/ha. For residue management in crop rotation: no mitigation measures are required for Leafy and Brassica	**acceptable with biennial application**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
													vegetables or for Oilseeds. For all other food and feed commodities except sugar canes, a 30-day PBI is supported. It is recommended that sugar canes not be planted for 125 days after application of clopyralid. For crop rota-tion manage-ment, see label for recommen-dations..	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
7	Poland	Winter Oilseed rape EPPO Code: BRSNW EU MRL Code: 0401060 Raw Human consumption Processed goods Cattle consumption	F	Broad-leaved weeds (BBBBB) (including but not only Cirsium arvense, Centaurea cyanus, Matricaria spp)	Broadcast, Foliar Tractor mounted boom	BBCH 30-51	a) 1 b) 1	NA	a) 0,4 b) 0,4	a) AS1: 158,104 (g as/ha), 120 (g ae/ha) b) AS1: 158,104 (g as/ha), 120 (g ae/ha)	100-400	Not applicable*	For residue management in crop rotation: no mitigation measures are required for Leafy and Brassica vegetables or for Oilseeds. For all other food and feed commodities except sugar canes, a 30-day PBI is supported. It is recommended that sugar canes not be planted for 125 days after application of clopyralid. For crop rotation management, see label for recommendations.	**acceptable with annual application**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
8	Slovakia, Czech Rep.	Winter Oilseed rape EPPO Code: BRSNW EU MRL Code: 0401060 Raw Human consumption Processed goods Cattle consumption	F	Broad-leaved weeds (BBBBB) (including but not only Cirsium arvense, Centaurea cyanus, Matricaria spp)	Broadcast, Foliar Tractor mounted boom	BBCH 30-51	a) 1 b) 1	NA	a) 0,35 b) 0,35	a) AS1: 138,341 (g as/ha), 105 (g ae/ha) b) AS1: 138,341 (g as/ha), 105 (g ae/ha)	100-400	Not applicable*	For residue management in crop rotation: no mitigation measures are required for Leafy and Brassica vegetables or for Oilseeds. For all other food and feed commodities except sugar canes, a 30-day PBI is supported. It is recommended that sugar canes not be planted for 125 days after application of clopyralid. For crop rotation management, see label for recommendations..	**acceptable with annual application**
9	Slovakia	Gladiolus EPPO Code: 1GLAG EU MRL Code: NA	F	Broad-leaved weeds (BBBBB) (including but not only Cirsium arvense, Matricaria spp.)	Broadcast foliar Tractor mounted boom	BBCH 12-19 (spring/summer)	a) 1 b) 1	NA	a) 0,4 b) 0,4	a) AS1: 158,104 (as/ha), 120 (ae/ha) b) AS1: 158,104 (as/ha), 120 (ae/ha)	100-400	Not applicable	One application every 2 years.	**acceptable with biennial application**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
													For residue management in crop rotation: no mitigation measures are required for Leafy and Brassica vegetables or for Oilseeds. For all other food and feed commodities except sugar canes, a 30-day PBI is supported. It is recommended that sugar canes not be planted for 125 days after application of clopyralid. For crop rotation management, see label for recommendations.	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10	Czech Republic, Slovakia	Spring Barley Spring Wheat Spring Oat Spring Rye Spring Triticale EPPO Code: HORVS TRZAS AVESP SECCS TTLSO EU MRL Code: 0500010 0500090 0500050 0500070 0500990 Raw Human consumption Processed goods Cattle consumption	F	Broad-leaved weeds (BBBBB) (including but not only Cirsium arvense, Centaurea cyanus, Matricaria spp)	Broadcast foliar Tractor mounted boom	BBCH 30-39	a) 1 b) 1	NA	a) 0,3 b) 0,3	a) AS1: 118,578 (as/ha), 90 (ae/ha) b) AS1: 118,578 (as/ha), 90 (ae/ha)	100-400	Not applicable*	*BBCH For residue management in crop rotation: no mitigation measures are required for Leafy and Brassica vegetables or for Oilseeds. For all other food and feed commodities except sugar canes, a 30-day PBI is supported. It is recommended that sugar canes not be planted for 125 days after application of clopyralid. For crop rotation management, see label for recommendations..	**acceptable with annual application**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
11	Czech Republic, Slovakia	Winter Barley Winter Wheat Winter Oat Winter Rye Winter Triticale EPPO Code: HORVW TRZAW AVESW SECCW TTLWI EU MRL Code: 0500010 0500090 0500050 0500070 0500990 Raw Human consumption Processed goods Cattle consumption	F	Broad-leaved weeds (BBBBB) (including but not only Cirsium arvense, Centaurea cyanus, Matricaria spp)	Foliar broadcast Tractor mounted boom	BBCH 30-39	a) 1 b) 1	NA	a) 0,3 b) 0,3	a) AS1: 118,578 (as/ha), 90 (ae/ha) b) AS1: 118,578 (as/ha), 90 (ae/ha)	100-400	Not applicable*	*BBCH For residue management in crop rotation: no mitigation measures are required for Leafy and Brassica vegetables or for Oilseeds. For all other food and feed commodities except sugar canes, a 30-day PBI is supported. It is recommended that sugar canes not be planted for 125 days after application of clopyralid. For crop rotation management, see label for recommendations..	**acceptable with annual application**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
12	Czech Republic, Slovakia	Grass for seeds (more than one-year old) EPPO Code: YGRAS EU MRL Code: NA	F	Broad-leaved weeds (BBBBB) (including but not only Cirsium arvense)	Broadcast foliar Tractor mounted boom	March 01 to July 15, one application every year.	a) 1 b) 1	NA	a) 0,4 b) 0,4	a) AS1: 158,104 (g as/ha), 120 (g ae/ha) b) AS1: 158,104 g (as/ha), 120 (g ae/ha)	100-400	7-days	One application every year. For residue management in crop rotation: no mitigation measures are required for Leafy and Brassica vegetables or for Oilseeds. For all other food and feed commodities except sugar canes, a 30-day PBI is supported. It is recommended that sugar canes not be planted for 125 days after application of clopyralid. For crop rotation management, see label for recommendations..	**acceptable with annual application apart the applications at 1 September (for this date the biennial application is appropriate)**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
13	Czech Republic, Slovakia	Grass for seeds (less than one-year old) EPPO Code: YGRAS EU MRL Code: NA	F	Broad-leaved weeds (BBBBB) (including but not only Cirsium arvense)	Broadcast foliar Tractor mounted boom	From BBCH 14 Slovakia: 01 March to 01 July Czeck Rep: 01 April to 01 July	a) 1 b) 1	NA	a) 0,4 b) 0,4	a) AS1: 158,104 (g as/ha), 120 (g ae/ha) b) AS1: 158,104 g (as/ha), 120 (g ae/ha)	100-400	7-days	One application every 3 years. For residue management in crop rotation: no mitigation measures are required for Leafy and Brassica vegetables or for Oilseeds. For all other food and feed commodities except sugar canes, a 30-day PBI is supported. It is recommended that sugar canes not be planted for 125 days after application of clopyralid. For crop rotation management, see label for recommendations..	**acceptable with annual application apart the applications at 1 March, 1 May, 1 June (for these date the biennial application is appropriate) and 1 July (for this date the triennial application is appropriate).**
14	Czech Republic, Slovakia	Lawn (established grass, more than one-year old) EPPO Code: NNNZW EU MRL Code: NA	F	Broad-leaved weeds (BBBBB) (including but not only Cirsium arvense)	Broadcast foliar Tractor mounted boom	March 01 to July 01, one application every year.	a) 1 b) 1	NA	a) 0,67 b) 0,67	a) AS1: 264,8 g (as/ha), 200 (g ae/ha) b) AS1: 264,8 (g as/ha), 200 (g ae/ha)	200-400	Not applicable	One application every year.	**acceptable with annual application apart the applications at 1 July and 1 August (for these date the biennial**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
													For residue management in crop rotation: no mitigation measures are required for Leafy and Brassica vegetables or for Oilseeds. For all other food and feed commodities except sugar canes, a 30-day PBI is supported. It is recommended that sugar canes not be planted for 125 days after application of clopyralid. For crop rotation management, see label for recommendations.	**application is appropriate)**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
15	Slovakia	Maize (grain, forage) EPPO Code: ZEAMX EU MRL Code: 0500030 Processed goods Human consumption (seeds) Cattle consumption	F	Broad-leaved weeds (BBBBB) (including but not only Cirsium arvense, Matricaria spp.)	Broadcast foliar Tractor mounted boom	BBCH 10-19	a) 1 b) 1	NA	a) 0,34 b) 0,34	a) AS1: 134,38 (as/ha), 102 (ae/ha) b) AS1: 134,38 (as/ha), 102 (ae/ha)	100-400	60 days for forage, 90 days for grain	One application every year. For residue management in crop rotation: no mitigation measures are required for Leafy and Brassica vegetables or for Oilseeds. For all other food and feed commodities except sugar canes, a 30-day PBI is supported. It is recommended that sugar canes not be planted for 125 days after application of clopyralid. For crop rotation management, see label for recommendations.	**acceptable with biennial application**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	Slovakia	Maize (grain, forage) EPPO Code: ZEAMX EU MRL Code: 0500030 Processed goods Human consumption (seeds) Cattle cosumption	F	Broad-leaved weeds (BBBBB) (including but not only Cirsium arvense, Matricaria spp.)	Broadcast foliar Tractor mounted boom	BBCH 30-32	a) 1 b) 1	NA	a) 0,34 b) 0,34	a) AS1: 134,38 (as/ha), 102 (ae/ha) b) AS1: 134,38 (as/ha), 102 (ae/ha)	100-400	60 days for forage, 90 days for grain	One application every 2 years. For residue management in crop rotation: no mitigation measures are required for Leafy and Brassica vegetables or for Oilseeds. For all other food and feed commodities except sugar canes, a 30-day PBI is supported. It is recommended that sugar canes not be planted for 125 days after application of clopyralid. For crop rotation management, see label for recommendations..	**acceptable with biennial application**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
17	Czech Republic, Slovakia, Poland	Onion for Seeds EPPO Code: ALLCE EU MRL Code: 0220020 Raw Human consumption Processed goods	F	Broad-leaved weeds (BBBBB) (including but not only Cirsium arvense, Matricaria spp.)	Broadcast Foliar Tractor mounted boom	BBCH 11-16	a) 1 b) 1	NA	a) 0,4 b) 0,4	a) AS1: 158,104 (as/ha), 120 (ae/ha) b) AS1: 158,104 (as/ha), 120 (ae/ha)	100-400	42-days	For residue management in crop rotation: no mitigation measures are required for Leafy and Brassica vegetables or for Oilseeds. For all other food and feed commodities except sugar canes, a 30-day PBI is supported. It is recommended that sugar canes not be planted for 125 days after application of clopyralid. For crop rotation management, see label for recommendations..	**acceptable with biennial application**
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)														
Minor uses according to Article 51 (zonal uses)														
Minor uses according to Article 51 (interzonal uses)														

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

* 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 clopyralid 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		
	CEU/SEU	Winter cereal (wheat, barley oat, rye, triticale, spelt)	F	Broad-leaf weeds	Overall broadcast foliar spray	BBCH 13-39 (1st Feb to 30th of June)	1	n/a	Clopyralid: 0.02 to 0.1 kg as/hL + Florasulam 0.0000625 to 0.0003125 kg as/hL + Fluroxypyr meptyl: 0.036 to 0.18 kg as/hL (0.025 to 0.125 kg ae/hL)	Clopyralid 0.08 kg as/ha + Florasulam 0.0025 kg as/ha + Fluroxypyr-meptyl 0.144 kg as/ha (0.100 kg ae/ha)	80-400	n/a	Dose: 1L GF-1374/ha Due to clopyralid content, straw treated with GF-1374 must not be used for compost production (for cultivating susceptible vegetables).
	CEU/SEU	Established permanent pasture	F	Broad-leaf weeds	Overall broadcast foliar spray	1st Feb to 30th September	1	n/a	Clopyralid: 0.03 to 0.15 kg as/hL + Florasulam 0.00009375 to 0.00046875 kg as/hL + Fluroxypyr meptyl: 0.054 to 0.27 kg as/hL (0.0375 to 0.1875 kg ae/hL)	Clopyralid 0.12 kg as/ha + Florasulam 0.00375 kg as/ha + Fluroxypyr-meptyl 0.216 kg as/ha (0.15kg ae/ha)	100-400	7 to 14 days (see note 1)	Dose: 1.5L GF-1374/ha. Note 1: PHI: 7 days for CEU and 14 days for SEU is the interval before any crop cutting or grazing. Fluroxypyr is the limiting factor. Clopyralid residues in plant tissue (including manure) which has not completely decayed may affect succeeding susceptible crops. Do not use any plant material treated with GF-1374 for composting. Do not use manure from animals fed on crops treated with GF-1374 for

													composting or mulching. Manure produced from animals fed on grass or forage treated with clopyralid can be used on or before the planting of crops such as grass, cereals and maize.

(a) For crops, the EU and Codex classifications (both) should be taken into account; where relevant, the use situation should be described (e.g. fumigation of a structure)
(b) Outdoor or field use (F), greenhouse application (G) or indoor application (I)
(c) *e.g.* biting and sucking insects, soil born insects, foliar fungi, weeds
(d) *e.g.* wettable powder (WP), emulsifiable concentrate (EC), granule (GR)
(e) CropLife International Technical Monograph no 2, 6th Edition. Revised May 2008. Catalogue of pesticide
(f) All abbreviations used must be explained
(g) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench
(h) Kind, *e.g.* overall, broadcast, aerial spraying, row, individual plant, between the plant- type of equipment used must be indicated
(i) g/kg or g/L. Normally the rate should be given for the active substance (according to ISO) and not for the variant in order to compare the rate for same active substances used in different variants (e.g. fluoroxypyr). **In certain cases, where only one variant is synthesised, it is more appropriate to give the rate for the variant (e.g. benthiavalicarb-isopropyl).**
(j) Growth stage range from first to last treatment (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application
(k) Indicate the minimum and maximum number of applications possible under practical conditions of use
(l) The values should be given in g or kg whatever gives the more manageable number (e.g. 200 kg/ha instead of 200 000 g/ha or 12.5 g/ha instead of 0.0125 kg/ha

General comment zRMS

Lontrel 300 SL (product code: EF-243) is a soluble concentrate formulation containing the active substances clopyralid (300 g ae/L; formulated as clopyralid – olamine (395.26 g/L)) for use on winter rape, sugar beet, gladiolus, cereals, maize, grass/alfalfa (>1 year), grass/alfalfa (<1 year) and onion in the EU Central Zone in particular in PL, CZ, SK.

Clopyralid (3,6-dichloropyridine2-carboxylic acid or 3,6-dichloropicolinic acid; CAS No 1702-17-6) recognised as approved for use in plant protection products under Regulation (EC) No 1107/2009 in Annex of Commission Implementing Regulation (EU) No 540/2011 of 25 May 2011 with the expiration of approval on 30 September 2036 [Consolidated text: Document 02011R0540-20221101].

For clopyralid only uses as herbicide may be authorised.

8.2 Metabolites considered in the assessment

No metabolites are considered relevant in this assessment.

Evaluation by zRMS	Metabolites considered in the assessment
Comments	According to EFSA Conclusion 2018 (EFSA Journal 2018;16(7):5389) no metabolites were formed in aerobic and anaerobic laboratory studies in soil, photolysis study on soil, field studies or water/sediment studies.

8.3 Rate of degradation in soil (KCP 9.1.1)

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

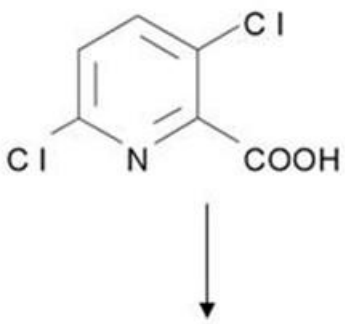
Evaluation by zRMS	Rate of degradation in soil (KCP 9.1.1)
Comments	No new data. Information in Section 8.3 is available in dossier of active substance clopyralid and can be extrapolated to formulation. Therefore no studies have been conducted. EU agreed data were correctly reported.
Agreed endpoint:	geomean DT50 value of 19.1 days

8.3.1 Aerobic degradation in soil (KCP 9.1.1.1)

The rate of degradation of clopyralid in laboratory soil under aerobic conditions was evaluated during Annex I renewal (EFSA, 2018[1]**)**. No additional studies have been performed. Endpoints derived from laboratory degradation studies were not used in the evaluation of the formulation but are presented in Table 8.3-1 for completeness. A proposed degradation pathway in soil is presented in Figure 8.3-1.

Figure 8.3-1: Proposed degradation pathway for clopyralid in soil

[1] EFSA (European Food Safety Authority), 2018. Conclusion on the peer review of the pesticide risk assessment of the active substance clopyralid. EFSA Journal 2018;16(7):5389, 28 pp. doi:10.2903/j.efsa.2018.5389



Incorporation into humin soil fraction (NER)
and/or
Mineralisation to CO_2

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

Clopyralid, Laboratory studies, dark aerobic conditions									
Soil name	**Soil type**	**pH (H_2O)**	**t. (°C)**	**Moisture (% MWHC)**	**DT_{50} / DT_{90} (d)**	**DT_{50} (d) 20 °C pF2 / 10kPa[a]**	**Chi^2 (%)**	**Ki-netic model**	**Evaluated on EU level / Reference**
Parabraunerde	Silt loam	7.7	20	18.63[b]	44.4 / 147.3	34.2	6.796	SFO	Yes / EFSA, 2018
Marcham	Sandy clay loam	8.3	20	20.19[b]	34.5 / 114.7	32.4	5.478	SFO	Yes / EFSA, 2018
Castle Rising	Sandy loam	8.0	20	65.13[b]	26.3 / 87.3	26.3	8.284	SFO	Yes / EFSA, 2018
Speyer 2.1	Sand	6.5	20	12.58[b]	64.6 / 214.6	64.6	5.466	SFO	Yes / EFSA, 2018
Speyer 2.2	Sand	6.3	20	18.56[b]	16.2 / 53.8	16.2	7.78	SFO	Yes / EFSA, 2018
Marshall county	Silt loam	6.0	25	23.42[c]	8.6 / 28.5	11.6	6.49	SFO	Yes / EFSA, 2018
A	Sandy loam	6.2	20	24.28[d]	16.5 / 54.8	16.5	4.856	SFO	Yes / EFSA, 2018
B	Clay loam	7.6	20	28.05[d]	23.0 / 76.4	23.0	6.767	SFO	Yes / EFSA, 2018
C	Clay loam	5.6	20	48.17[d]	4.9 / 16.2	4.9	12.73	SFO	Yes / EFSA, 2018
D	Loam	7.5	20	35.30[d]	9.8 / 32.4	9.8	10.17	SFO	Yes / EFSA, 2018
Geometric mean (n = 10)						19.1			
pH-dependency					No				

[a] normalised using a Q_{10} of 2.58 and a Walker equation coefficient of 0.7
[b] reported soil moisture 40 % of maximum WHC
[c] reported soil moisture 75 % of 1/3 bar WHC
[d] reported soil moisture 45 % WHC

Persistency is assessed for clopyralid, based on the triggering endpoints presented above. All DT_{50} values << 180 days. Therefore it can be concluded that clopyralid is not classified as persistent.

8.3.2 Anaerobic degradation in soil (KCP 9.1.1.1)

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

The anaerobic degradation of clopyralid and its metabolites in soil was evaluated during Annex I renewal (EFSA, 2018)[1]. No additional studies have been performed.

8.4 Field studies (KCP 9.1.1.2)

Evaluation by zRMS	Field studies (KCP 9.1.1.2)
Comments	No new data. Information in Section 8.4 is available in dossier of active substance clopyralid and can be extrapolated to formulation. Therefore no studies have been conducted. EU agreed data were correctly reported.
Agreed endpoints:	- worst case $DT50_{actual}$ value of 23.7 days for PECsoil calculations - geomean DT50 value of 7.05 days for PECgw and PECsw, PECsed modelling

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

The field dissipation rates of clopyralid were evaluated during Annex I renewal (EFSA, 2018)[1]. No additional studies have been performed. Endpoints derived from field degradation studies were used in the evaluation of the formulation and are presented in Table 8.4-1.

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

Clopyralid, Field studies									
Soil type	**Location**	**pH (H_2O)**	**Depth (cm)**	**DT_{50} (d) actual**	**DT_{90} (d) actual**	**Chi^2 (%)**	**DT_{50} (d) Norm[a]**	**Kinetic model**	**Evaluated on EU level / Reference**
Loamy sand (bare)	Bargstedt, Germany	4.3	0-100	21.0	69.6	23.9	13.0	SFO	Yes / EFSA, 2018
Loam (bare)	Wilson, UK	6.2	0-100	16.7	55.6	22.6	13.5	SFO	Yes / EFSA, 2018
Silty clay loam (bare)	Sermaises, France	7.0	0-100	16.3	54	19.3	7.5	SFO	Yes / EFSA, 2018
Silty clay loam (bare)	Ansonville, France	8.2	0-20	0.16	12.1	5.36	2.07	DFOP / SFO Norm	Yes / EFSA, 2018
Clay loam (bare)	Mainbervilliers, France	7.1	0-20	6.04	28.3	7.22	2.7	DFOP / SFO Norm	Yes / EFSA, 2018
Silty clay loam (bare)	Oederquart, Germany	7.5	0-20	16.2	53.9	12.0	5.69	SFO	Yes / EFSA, 2018
Sandy clay loam (bare)	Middlefart, Denmark	7.5	0-20	23.7	78.7	13.1	8.46	SFO	Yes / EFSA, 2018
Clay loam (bare)	Canals, Spain	8.0	0-100	13.7	45.5	19.2	12.3	SFO	Yes / EFSA, 2018

Clopyralid, Field studies									
Soil type	**Location**	**pH (H_2O)**	**Depth (cm)**	**DT_{50} (d) actual**	**DT_{90} (d) actual**	**Chi^2 (%)**	**DT_{50} (d) Norm[a]**	**Kinetic model**	**Evaluated on EU level / Reference**
Silty clay loam (bare)	B. Württemberg, Germany	7.4[b]	0-100	10.2	33.9	7.94	9.34	SFO	Yes / EFSA, 2018
Silt loam (bare)	B. d'Islemade, France	7.3[b]	0-100	9.11	30.3	17.6	7.41	SFO	Yes / EFSA, 2018
Geometric mean (n = 10)							7.05		
pH dependency				No					

[a] normalised using a Q_{10} of 2.58 and Walker coefficient of 0.7, values are $DegT_{50,\ matrix}$
[b] 0-30 cm

Persistency is assessed for clopyralid, based on the triggering endpoints presented above. All DT_{50} values << 180 days. Therefore it can be concluded that clopyralid is not classified as persistent.

8.4.2 Soil accumulation testing (KCP 9.1.1.2.2)

Soil accumulation testing is not required for clopyralid since $DissT_{90}$ in the field is not greater than the trigger value of 365 days.

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.

Evaluation by zRMS	**Mobility in soil (KCP 9.1.2)**
Comments	The mobility in soil of clopyralid was evaluated during the Annex I renewal (EFSA, 2018) and this data can be extrapolated to formulation. EU agreed data were correctly reported.
Agreed endpoints:	- geomean Koc value of 1.41 for PECgw, PECsw and PECsed modelling together with arithmetic mean 1/n value of 0.836.

8.5.1 Clopyralid

The mobility of clopyralid in laboratory soil was evaluated during Annex I renewal (EFSA, 2018)[1]. No additional studies have been performed. Endpoints derived from laboratory adsorption/desorption studies are presented in Table 8.5-1.

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

Clopyralid							
Soil name	**Soil type**	**OC (%)**	**pH ($CaCl_2$)**	**K_f (L/kg)**	**K_{foc} (L/kg)**	**1/n (-)**	**Evaluated on EU level / Reference**
Merzenhausen	Silt loam[c]	1.00	7.19	0.0057	0.57[a]	0.9[b]	Yes / EFSA, 2018
Kladenkirchen	Loamy sand[c]	0.98	5.34	0.0267	2.72[a]	0.9[b]	Yes / EFSA, 2018
Lanna	Clay loam[c]	2.06	6.62	0.0054	0.26[a]	0.9[b]	Yes / EFSA, 2018
Overhetfeld	Loamy sand[c]	0.93	6.49	0.0125	1.34[a]	0.9[b]	Yes / EFSA, 2018
Calke	Sandy loam[d]	3.15	5.7	0.01	0.5	0.489	Yes / EFSA, 2018
Longwoods	Sandy loam[d]	3.13	7.4	0.08	2.5	0.9[b]	Yes / EFSA, 2018
LUFA 2.1	Loamy sand[d]	0.68	4.9	0.03	4.1	0.9[b]	Yes / EFSA, 2018
Quilen	Loam[d]	4.02	6.9	0.16	3.9	0.804	Yes / EFSA, 2018
DU-L-PF	Clay loam[d]	6.47	6.3	0.14	2.1	0.829	Yes / EFSA, 2018
Geometric mean (n = 9)					1.41	-	
Arithmetic mean (n = 9)					-	0.836	
pH-dependency					No		

[a] calculated and reported in M-CA, not in the study report
[b] for modelling each soil was checked against OECD 106 reliability criterion (K_d > 0.1 for direct method and K_d > 0.3 for indirect method). Freundlich coefficient of soils not meeting the criterios was set to 0.9
[c] BBA soil textural classification
[d] USDA soil textural classification

8.5.2 Column leaching (KCP 9.1.2.1)

Column leaching studies for clopyralid were not conducted since reliable adsorption coefficient values were obtained in the laboratory soil mobility studies (see Section 8.5.1).

8.5.3 Lysimeter studies (KCP 9.1.2.2)

The mobility of clopyralid in soil was assessed with groundwater modelling tools (Section 8.8) using the degradation and adsorption data described under Section 8.4.1 and Section 8.5.1, respectively. However, lysimeter studies for clopyralid were conducted as part of the original Annex I inclusion. The uses on oilseed rape and sugar beet studied in the lysimeter studies are no longer supported as representative for clopyralid in the AIR3 evaluation. However, the data were attached in the Annex I renewal dossier as

additional information (EFSA, 2018)[1]. No additional studies have been performed.

8.5.4 Field leaching studies (KCP 9.1.2.3)

Field leaching studies for clopyralid were not conducted since reliable adsorption coefficient data were obtained in laboratory soil mobility studies (Section 8.5.1) and leaching to groundwater was assessed with groundwater modelling tools (Section 8.8).

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.

Studies on the degradation of clopyralid in aquatic systems was evaluated during Annex I renewal (EFSA, 2018)[1]. No additional studies have been performed. Endpoints derived from aquatic degradation studies are presented in Table 8.6-1.

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

Distribution: max in water 100.13 % at 0 d, max. sediment 19 % at 100 d (loamy sand) **Distribution: max in water 99.0 % at 0 d, max sediment 26 % at 100 d (sandy silt loam)**										
Water/ sed. system	**pH water/ sed.**	**DegT$_{50}$ whole sys. (d)**	**DegT$_{90}$ whole sys. (d)**	**Kinetic model**	**DissT$_{50}$ water (d)**	**DissT$_{90}$ water (d)**	**Kinetic model**	**DissT$_{50}$ sed. (d)**	**Kinetic model**	**Evaluated on EU level / Reference**
Loamy sand	6.5 / 5.5	>500	>500	First-order	128		First-order	>500	First-order	Yes / EFSA, 2018
Sandy silt loam	8.16 / 7.7	>500	>500	First-order	167		First-order	>500	First-order	Yes / EFSA, 2018
Geometric mean at 20 °C (n = 2) [a]					148					

[a] normalised using a Q_{10} of 2.58

Evaluation by zRMS	**Degradation in the water/sediment systems (KCP 9.2)**
Comments	No new data. Information in Section 8.6 is available in dossier of active substance clopyralid and can be extrapolated to the formulation. Therefore no studies have been conducted.
Agreed endpoints:	- Geomean DegT$_{50}$ value of > 500 days for whole system - Geomean DissT$_{50}$ value of 148 days for water phase - Geomean DissT$_{50}$ value of >500 days for sediment

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

8.7.1 Justification for new endpoints

EU agreed endpoints were used for the PEC_{soil} calculations of clopyralid (EFSA, 2018[1]).

8.7.2 Active substance

The following PEC_{soil} calculations for clopyralid have not previously been reviewed and are provided in support of this assessment. For details please refer to Anagu and González Camarero, 2021 (Appendix 1). Further details are presented in Appendix 3 of this document (A 3.1).

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

Crop	Sugar beets		Oil seed rape, winter
Application rate (g a.e./ha)	120	60	120
Number of applications (-) / interval (d)	1 / -	2 / 7	1 / -
Crop interception (%)[a]	20		80

Crop	Maize	Linseed	Grass/alfalfa (<1 year)
Application rate (g a.e./ha)	100	120	120
Number of applications (-) / interval (d)	1 / -	1 / -	1 / -
Crop interception (%)[a]	25	30	40

Crop	Grass/alfalfa (>1 year)	Onions	Cereals (winter and spring)
Application rate (g a.e./ha)	200	120	120
Number of applications (-) / interval (d)	1 / -	1 / -	1 / -
Crop interception (%)[a]	90	10	80

[a] based on FOCUS (2014[2])

[2] FOCUS (2014). Generic guidance for Tier 1 FOCUS ground water assessments, version 2.2. FOCUS groundwater scenarios working group.1.

Table 8.7-2: Input parameters for active substance for PEC_{soil} calculations

Compound	Molar mass (g/mol)	Max. occurrence (%)	DT_{50} (d)	Value in accordance with EU endpoint / Reference
Clopyralid	191.96	-	23.7 (maximum, n = 10)	Yes / EFSA, 2018

Table 8.7-3 PEC_{soil} for clopyralid following application to sugar beets (1 × 120 g a.e./ha, BBCH 12 – 39 interception = 20 %)

PEC_{soil} (mg/kg)		Sugar beets, 1 × 120 g a.e./ha	
		Actual	TWA
Initial		0.128	-
Short term	24 h	0.124	0.126
	2 d	0.121	0.124
	4 d	0.114	0.121
Long term	7 d	0.104	0.116
	14 d	0.085	0.105
	21 d	0.069	0.096
	28 d	0.056	0.087
	50 d	0.030	0.067
	100 d	0.007	0.041

Table 8.7-4 PEC_{soil} for clopyralid following application to sugar beets (2 × 60 g a.e./ha, BBCH 12 – 15 interception = 20 %)

PEC_{soil} (mg/kg)		Sugar beets, 2× 60 g a.e./ha	
		Actual	TWA
Initial		0.116	-
Short term	24 h	0.113	0.114
	2 d	0.110	0.113
	4 d	0.103	0.110
Long term	7 d	0.095	0.105
	14 d	0.077	0.095
	21 d	0.063	0.087
	28 d	0.051	0.079

PEC_{soil} (mg/kg)		**Sugar beets, 2× 60 g a.e./ha**	
		Actual	**TWA**
	50 d	0.027	0.061
	100 d	0.006	0.038

Table 8.7-5 PEC_{soil} for clopyralid following application to oil seed rape, winter (1 × 120 g a.e./ha, BBCH 30 – 50 interception = 80 %)

PEC_{soil} (mg/kg)		**Oil seed rape, winter, 1 × 120 g a.e./ha**	
		Actual	**TWA**
Initial		0.032	-
Short term	24 h	0.031	0.032
	2 d	0.030	0.031
	4 d	0.028	0.030
Long term	7 d	0.026	0.029
	14 d	0.021	0.026
	21 d	0.017	0.024
	28 d	0.014	0.022
	50 d	0.007	0.017
	100 d	0.002	0.010

Table 8.7-6 PEC_{soil} for clopyralid following application to linseed (1 × 120 g a.e./ha, BBCH 12 – 32 interception = 30 %)

PEC_{soil} (mg/kg)		**Linseed, 1 × 120 g a.e./ha**	
		Actual	**TWA**
Initial		0.112	-
Short term	24 h	0.109	0.110
	2 d	0.106	0.109
	4 d	0.100	0.106
Long term	7 d	0.091	0.101
	14 d	0.074	0.092
	21 d	0.061	0.084
	28 d	0.049	0.076
	50 d	0.026	0.059

PEC_{soil} (mg/kg)		**Linseed, 1 × 120 g a.e./ha**	
		Actual	**TWA**
	100 d	0.006	0.036

Table 8.7-7 PEC_{soil} for clopyralid following application to maize (1 × 100 g a.e./ha, BBCH 10 – 32 interception = 25 %)

PEC_{soil} (mg/kg)		**Maize, 1 × 100 g a.e./ha**	
		Actual	**TWA**
Initial		0.100	-
Short term	24 h	0.097	0.099
	2 d	0.094	0.097
	4 d	0.089	0.094
Long term	7 d	0.081	0.090
	14 d	0.066	0.082
	21 d	0.054	0.075
	28 d	0.044	0.068
	50 d	0.023	0.053
	100 d	0.005	0.032

Table 8.7-8 PEC_{soil} for clopyralid following application to grass/alfalfa (<1 year) (1 × 120g a.e./ha, interception = 40 %)

PEC_{soil} (mg/kg)		**Grass (<1 year), 1 × 120 g a.e./ha**	
		Actual	**TWA**
Initial		0.096	-
Short term	24 h	0.093	0.095
	2 d	0.091	0.093
	4 d	0.085	0.091
Long term	7 d	0.078	0.087
	14 d	0.064	0.079
	21 d	0.052	0.072
	28 d	0.042	0.066
	50 d	0.022	0.050
	100 d	0.005	0.031

Table 8.7-9 **PEC_{soil} for clopyralid following application to grass/alfalfa (>1 year) (1 × 200 g a.e./ha, interception = 90 %)**

PEC_{soil} (mg/kg)		**Grass established (>1 year), 1 × 200 g a.e./ha**	
		Actual	**TWA**
Initial		0.027	-
Short term	24 h	0.026	0.026
	2 d	0.025	0.026
	4 d	0.024	0.025
Long term	7 d	0.022	0.024
	14 d	0.018	0.022
	21 d	0.014	0.020
	28 d	0.012	0.018
	50 d	0.006	0.014
	100 d	0.001	0.009

Table 8.7-10 **PEC_{soil} for clopyralid following application to onions (1 × 120 g a.e./ha, BBCH 11 – 16 interception = 10 %)**

PEC_{soil} (mg/kg)		**Onions, 1 × 120 g a.e./ha**	
		Actual	**TWA**
Initial		0.144	-
Short term	24 h	0.140	0.142
	2 d	0.136	0.140
	4 d	0.128	0.136
Long term	7 d	0.117	0.130
	14 d	0.096	0.118
	21 d	0.078	0.108
	28 d	0.063	0.098
	50 d	0.033	0.076
	100 d	0.008	0.047

Table 8.7-11 PEC_{soil} for clopyralid on following application to cereals (1 × 120 g a.e./ha, BBCH 30 – 39 interception = 80 %)

PEC_{soil} (mg/kg)		**Cereals (winter and spring), 1 × 120 g a.e./ha**	
		Actual	**TWA**
Initial		0.032	-
Short term	24 h	0.031	0.032
	2 d	0.030	0.031
	4 d	0.028	0.030
Long term	7 d	0.026	0.029
	14 d	0.021	0.026
	21 d	0.017	0.024
	28 d	0.014	0.022
	50 d	0.007	0.017
	100 d	0.002	0.010

PEC_{soil} of EF-243

Table 8.7-12: PEC_{soil} for EF-243 on various crops

Active substance / preparation[a]	**Application rate (g EF-243/ha)**	**PEC_{act} (mg/kg)**
EF-243	~~760.5~~ 760.9	0.913

[a] the formulation components are considered to dissipate rapidly after application, therefore only one application is taken into consideration. The PEC for the formulation was based on a specific density of 1.1408 g/mL with an application of 0.667 L EF-243/ha and an interception rate of 10 % representing the maximum use and worst case interception rate in the GAP.

Evaluation by zRMS	**PECsoil (KCP 9.1.3)**
Modelling	The assumptions and results of calculations are acceptable. The predicted environmental concentrations in soil (PECsoil) of clopyralid were calculated according to recommendations of the FOCUS workgroup on degradation kinetics using: - maximum application rate for clopyralid 120 g/ha – single application, considering 20% interception for sugar beets. - maximum application rate for clopyralid 120 g/ha/per season but divided in two applications of 60 g a.s./ha with the interval between applications 7days, considering 20% interception for sugar beets. - maximum application rate for clopyralid 120 g/ha – single application, considering 80% interception for oil seed rape, winter. - maximum application rate for clopyralid 100 g/ha – single application, considering 25% interception for maize.

	- maximum application rate for clopyralid 120 g/ha – single application, considering 30% interception for linseed. - maximum application rate for clopyralid 120 g/ha – single application, considering 40% interception for grass (<1 year). - maximum application rate for clopyralid 200 g/ha – single application, considering 90% interception for grass (>1 year). - maximum application rate for clopyralid 120 g/ha – single application, considering 10% interception for onions - maximum application rate for clopyralid 120 g/ha – single application, considering 80% interception for cereals (spring and winter). It was assumed that the avtive substance was distributed in the top 5 cm soil layer with a soil bulk density of 1.5 g/mL. The calculated PECs values are presented in Tables from 8.7-3 to 8.7-11. The applicant correctly calculated the PECsoil for the formulation Lontrel 300 SL (EF-243). The calculated PECsoil values for clopyralid and Lontrel 300 SL (EF-243) are appropriate to be used for the subsequent risk assessment for soil organisms.
Agreed Endpoints	**Clopyralid:** Crop: **Sugar beets** Application rate : 120g as /ha Initial PEC_{soil}: 0.128 mg/kg Crop: **Sugar beets** Application rate : 2x60g as /ha (interval:7d) Initial PEC_{soil}: 0.116 mg/kg Crop: **oil seed rape, winter** Application rate : 120g as /ha Initial PEC_{soil}: 0.032 mg/kg Crop: **Linseed** Application rate : 120g as /ha Initial PEC_{soil}: 0.112 mg/kg Crop: **Maize** Application rate : 100g as /ha Initial PEC_{soil}: 0.100 mg/kg Crop: **Grass (<1 year)** Application rate : 120g as /ha Initial PEC_{soil}: 0.096 mg/kg Crop: **Grass (>1 year)** Application rate : 200g as /ha Initial PEC_{soil}: 0.027 mg/kg Crop: **Onions, Vegetables bulb**

	Application rate: 120g as /ha Initial PEC_{soil}: 0.144 mg/kg Crop: **Cereals (winter and spring)** Application rate : 120g as /ha Initial PEC_{soil}: 0.032 mg/kg **Formulation: Lontrel 300 (EF-243)** For the worst **application rate : 760,9 g EF-243 /ha, 10% interception** PECact = 0.913 mg/kg

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

8.8.1 Justification for new endpoints

EU agreed endpoints were used for the PEC_{gw} calculations of clopyralid (EFSA, 2018[1]). Justification for using a refined plant uptake factor of 0.5 is presented in Appendix 4.

8.8.2 Active substance (KCP 9.2.4.1)

The following PEC_{gw} modelling for clopyralid has not previously been reviewed and is provided in support of this assessment. For details please refer to Anagu and González Camarero, 2021 (Appendix 1). Only results most relevant to the current assessment are presented here.

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

Crop	Sugar beets			
Application rate (g a.e./ha)	120	100	60	
Number of applications (-) / interval (d)	1 / -		2 / 7	2 /-[c]
BBCH growth stage	12 – 39 (July 1st)		12 – 15	15 + 31[c]
Modelling scenarios (timing, interception[a])	BBCH 12 (AppDate), 20 % BBCH 31 (AppDate) 70 % BBCH 39[b] (July 1st) 70 %		BBCH 12 (AppDate) 20 %	BBCH 15 (AppDate), 20 % BBCH 31 (AppDate), 70 %
PHI (d)	42			
Frequency of application	Annual, biennial, triennial			
Models used for	FOCUS PEARL 4.4.4, FOCUS PELMO 5.5.3, FOCUS MACRO 5.5.4			

calculation	

Crop	Oil seed rape, winter	Linseed[d]	Maize	
Application rate (g a.e./ha)	120	120	100	
Number of applications (-) / interval (d)	1 / -	1 / -	1 / -	
BBCH growth stage	30 – 50	12 – 32	10 – 19	30 – 32
Modelling scenarios (timing, interception[a])	BBCH 30 (AppDate), 80 % BBCH 50 (AppDate), 80 %	BBCH 12 (AppDate), 30 % BBCH 32 (AppDate), 60 %	BBCH 10 (AppDate), 25 %	BBCH 32 (AppDate), 50 %
PHI (d)	-		60 / 90[e]	
Frequency of application	Annual, biennial, triennial			
Models used for calculation	FOCUS PEARL 4.4.4, FOCUS PELMO 5.5.3, FOCUS MACRO 5.5.4			

Crop	Grass/alfalfa (>1 year)		Grass/alfalfa (<1 year)
Application rate (g a.e./ha)	200	120	120
Number of applications (-) / interval (d)	1 / -		1 / -
BBCH growth stage	Mar – Aug	Mar – Sep	Mar – Jul
Modelling scenarios (timing, interception[a])	01 Mar, 01 Apr, 01 May, 01 Jun, 01 Jul, 01 Aug, 01 Sep 90 %		1 Mar, 1 Apr, 1 May, 1 Jun, 1 Jul 40 %
PHI (d)	7		
Frequency of application	Annual, biennial, triennial		
Models used for calculation	FOCUS PEARL 4.4.4, FOCUS PELMO 5.5.3, FOCUS MACRO 5.5.4		

Crop	Onions / Vegetables, bulb	Cereals, winter	Cereals, spring
Application rate (g a.e./ha)	120	90	120
Number of applications (-) /	1 / -	1 / -	1 / -

interval (d)			
BBCH growth stage	11 – 16	30 – 39	30 – 39
Modelling scenarios (timing, interception)	BBCH 11 (AppDate), 10 %	BBCH 30 (AppDate), 80 %	BBCH 30 (AppDate), 80 %
PHI (d)	42	-	
Frequency of application	Annual, biennial, triennial	Annual	
Models used for calculation	FOCUS PEARL 4.4.4, FOCUS PELMO 5.5.3, FOCUS MACRO 5.5.4		

[a] based on FOCUS (2014[2])
[b] according to the GAP, the latest application date should be the 1st of July. However, the AppDate recommended dates for some of the FOCUS scenarios (H, K, J and N) are later than the 1st of July. Therefore, simulations for BBCH 39 were performed with an application date of 1st July
[c] 1st application at BBCH 15 and 2nd application at BBCH 31. For the Sevilla scenario, the AppDate recommended application dates for BBCH 15 and BBCH 31 are 20th December and 4th February, respectively. As this application sequence could not be implemented in PELMO, the second application date for the Sevilla scenario was set 27th December (7d interval).
[d] maize used as surrogate crop for FOCUS MACRO modelling
[e] 90 days for grain and 60 days for silage

Modelling was conducted in a tiered approach with the standard FOCUS scenarios. At Tier 1, the worst case plant uptake factor (PUF) of 0 was considered. A PUF value of 0.000271, resulting from Brigg's equation was assessed, however the resulting PEC_{gw} values were the same as the PEC_{gw} values obtained using a PUF of 0. Furthermore, since clopyralid acts systemically, it was considered appropriate to present higher tier (Tier 2) simulations conducted with a PUF of 0.5.

For sugar beets, the latest application date should be the 1st of July. However, the AppDate recommended dates for some of the FOCUS scenarios (H, K, J and N) are later than the 1st of July. Therefore, additional simulations were performed with an application date of 1st July as refinement for those scenarios.

In order to cover the wide range of BBCH growth stages represented in the GAP, more than one set of application dates were defined for some of the uses, to represent early and late BBCH growth stages. For some crops, a pre-harvest interval (PHI) is specified in the GAP. In cases where the AppDate v.3.06 recommended application date occurs later than the given PHI, the last application date was set to the harvest date minus the PHI.

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

Crop (use)	**Scenario**	**Application dates (absolute)[a]**	
		First application	**Second application**
Sugar beets 1 × 120 g a.e./ha 1 × 100 g a.e./ha BBCH 12	Châteaudun	26-Apr (116)	-
	Hamburg	30-Apr	-
	Jokioinen	03-Jun	-
	Kremsmünster	30-Apr	-

Crop (use)	**Scenario**	**Application dates (absolute)[a]**	
		First application	**Second application**
	Okehampton	09-May	-
	Piacenza	02-Apr	-
	Porto	21-Mar	-
	Sevilla	27-Nov	-
	Thiva	08-May	-
Sugar beets 1 × 120 g a.e./ha 1 × 100 g a.e./ha BBCH 31	Châteaudun	05-Jun (156)	-
	Hamburg	30-Jun	-
	Jokioinen	07-Jul	-
	Kremsmünster	30-Jun	-
	Okehampton	04-Jul	-
	Piacenza	25-May	-
	Porto	10-Apr	-
	Sevilla	04-Feb	-
	Thiva	03-Jun	-
Sugar beets 1 × 120 g a.e./ha 1 × 100 g a.e./ha BBCH 39 (1-Jul)	Châteaudun	01-Jul (182)	-
	Hamburg	01-Jul	-
	Jokioinen	01-Jul	-
	Kremsmünster	01-Jul	-
	Okehampton	01-Jul	-
	Piacenza	01-Jul	-
	Porto[b]	20-Jun	-
	Sevilla[b]	20-May	-
	Thiva	01-Jul	-
Sugar beets 2 × 60 g a.e./ha BBCH 12 (7 d interval)	Châteaudun	26-Apr (116)	03-May (123)
	Hamburg	30-Apr	07-May
	Jokioinen	03-Jun	10-Jun
	Kremsmünster	30-Apr	07-May
	Okehampton	09-May	16-May
	Piacenza	02-Apr	09-Apr
	Porto	21-Mar	28-Mar
	Sevilla	27-Nov	04-Dec
	Thiva	08-May	15-May
Sugar beets	Châteaudun	09-May (129)	05-Jun (156)

Crop (use)	**Scenario**	**Application dates (absolute)[a]**	
		First application	**Second application**
2 × 60 g a.e./ha BBCH 15 + 31 (1st app. at BBCH 15 2nd app. at BBCH 31)	Hamburg	20-May	30-Jun
	Jokioinen	14-Jun	07-Jul
	Kremsmünster	20-May	30-Jun
	Okehampton	28-May	04-Jul
	Piacenza	20-Apr	25-May
	Porto	27-Mar	10-Apr
	Sevilla	20-Dec	04-Feb
	Thiva	17-May	03-Jun
Oil seed rape, winter 1 × 120 g a.e./ha BBCH 30	Châteaudun	11-Mar (70)	-
	Hamburg	18-Apr	-
	Kremsmünster	15-Apr	-
	Okehampton	09-Apr	-
	Piacenza	07-Mar	-
	Porto	29-Dec	-
Oil seed rape, winter 1 × 120 g a.e./ha BBCH 50	Châteaudun	31-Mar (90)	-
	Hamburg	27-Apr	-
	Kremsmünster	25-Apr	-
	Okehampton	20-Apr	-
	Piacenza	27-Mar	-
	Porto	23-Feb	-
Linseed[c] 1 × 120 g a.e./ha BBCH 12	Châteaudun	09-May (129)	-
	Okehampton	06-Apr	-
Linseed[c] 1 × 120 g a.e./ha BBCH 32	Châteaudun	13-Jun (164)	-
	Okehampton	04-May	-
Maize 1 × 100 g a.e./ha BBCH 10	Châteaudun	02-May (122)	-
	Hamburg	06-May	-
	Kremsmünster	06-May	-
	Okehampton	26-May	-
	Piacenza	16-May	-
	Porto	02-May	-
	Sevilla	08-Mar	-
	Thiva	21-Apr	-
Maize	Châteaudun	13-Jun (164)	-

Crop (use)	**Scenario**	**Application dates (absolute)[a]**	
		First application	**Second application**
1 × 100 g a.e./ha BBCH 32	Hamburg	09-Jun	-
	Kremsmünster	09-Jun	-
	Okehampton	15-Jun	-
	Piacenza	15-Jun	-
	Porto	13-Jun	-
	Sevilla	17-Apr	-
	Thiva	13-May	-
Grass/alfalfa (>1 year) 1 × 200 g a.e/ha 1 × 120 g a.e./ha	Châteaudun	01-Mar (60); 01-Apr (91); 01-May (121); 01-Jun (152); 01-Jul (182); 01-Aug (213); 01-Sep (244)[d]	-
	Hamburg		-
	Jokioinen		-
	Kremsmünster		-
	Okehampton		-
	Piacenza		-
	Porto		-
	Sevilla		-
	Thiva		-
Grass/alfalfa (<1 year) 1 × 120 g a.e/ha	Châteaudun	01-Mar (60); 01-Apr (91); 01-May (121); 01-Jun (152); 01-Jul (182)	-
	Hamburg		-
	Jokioinen		-
	Kremsmünster		-
	Okehampton		-
	Piacenza		-
	Porto		-
	Sevilla		-
	Thiva		-
Onions / Vegetables, bulb 1 × 120 g a.e./ha BBCH 11	Châteaudun	03-May (123)	-
	Hamburg	03-May	-
	Jokioinen	25-May	-
	Kremsmünster	03-May	-
	Porto	09-Mar	-
	Thiva	18-Apr	-
Cereals, winter 1 × 90 g a.e./ha	Châteaudun	15-Apr (105)	-
	Hamburg	04-May	-

Crop (use)	Scenario	Application dates (absolute)[a]	
		First application	Second application
BBCH 30	Jokioinen	14-May	-
	Kremsmünster	24-Apr	-
	Okehampton	21-Apr	-
	Piacenza	19-Mar	-
	Porto	30-Jan	-
	Sevilla	06-Jan	-
	Thiva	18-Jan	-
Cereals, spring 1 × 120 g a.e./ha BBCH 30	Châteaudun	16-Apr (106)	-
	Hamburg	28-Apr	-
	Jokioinen	05-Jun	-
	Kremsmünster	27-Apr	-
	Okehampton	22-Apr	-
	Porto	16-Apr	-

[a] dates in brackets represents Julian days used in the MACRO simulations
[b] application date set as harvest - PHI
[c] the FOCUS crop "maize" was used as surrogate in the MACRO simulations
[d] only for the application rate 1 × 120 g a.e./ha

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

Compound	Clopyralid	Value in accordance with EU endpoint / Reference
Molar mass (g/mol)	191.96	Y / EFSA, 2018
Water solubility (mg/L)	1.43×10^5 (20 °C)	Y / EFSA, 2018
Saturated vapour pressure (Pa)	0 (worst case)	Y / EFSA, 2018
$DT_{50,soil}$ (d)	7.05 (geometric mean, field, normalised, n = 10)	Y / EFSA, 2018
Transformation rate (1/d)[a]	0.098319 (to sink)	Y / EFSA, 2018
K_{foc} / K_{fom}[b] (L/kg)	1.41 / 0.818 (geometric mean, n = 9)	Y / EFSA, 2018
Freundlich Exponent 1/n (-)	0.836 (arithmetic mean, n = 9)	Y / EFSA, 2018
Plant uptake factor (-)	Tier 1: 0[*] ~~Tier 2: 0.5~~[**]	[*]Y / EFSA, 2018 [**] ~~Default value for systemic~~

Compound	**Clopyralid**	**Value in accordance with EU endpoint / Reference**
		~~compounds (Gourlay, 2015[3] and Hall, 2015[4])~~
Limit for Freundlich (µg/L)[c]	0	Default[c]

[a] for PELMO calculated as follows: (ln(2)/DT_{50})
[b] $K_{fom} = K_{foc}/1.724$
[c] for PELMO based on the recommended default of 10^{-20} µg/L given in Jones et al. (2011) [5]

FOCUS PEARL

Table 8.8-4: PEC_{gw} for clopyralid following application to sugar beets (FOCUS PEARL 4.4.4)

Crop (use)	**Scenario**	**80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)**					
		PUF 0			**~~PUF 0.5~~**		
		An-nual	**Bien-nial**	**Trien-nial**	**An-nual**	**~~Bien-nial~~**	**~~Trien-nial~~**
Sugar beets 1 × 120 g a.e./ha BBCH 12 the PECgw values calculated using the latest versions of FOCUS PEARL 5.5.5 and FOCUS PELMO 6.6.4 was highlighted in yellow	Châteaudun	0.151 0.144	0.071 0.070	-	~~0.080~~	-	-
	Hamburg	0.114 0.116	0.064 0.065	-	~~0.048~~	-	-
	Jokioinen	0.257 0.246	0.134 0.133	0.105 0.104	~~0.130~~	~~0.068~~	-
	Kremsmünster	0.059 0.060	-	-	-	-	-
	Okehampton	0.065 0.066	-	-	-	-	-
	Piacenza	0.028 0.031	-	-	-	-	-
	Porto	0.040 0.038	-	-	-	-	-
	Sevilla	0.535 0.526	0.189 0.176	0.063 0.061	~~0.472~~	~~0.177~~	~~0.060~~

[3] Gourlay, V. (2015): Plant uptake of ^{14}C-labelled clopyralid in wheat and oilseed rape under greenhouse conditions; RLP AgroScience GmbH, 67435 Neustadt a.d. Weinstraße, Germany; Lab Study No. AS421; DAS Study No. 150297; 25.06.2015; Unpublished
[4] Hall, L. R. (2015): ^{14}C-Clopyralid: Metabolism in Confined Rotational Crops with a 30-Day Plant-back Interval; ABC Laboratories, Inc., Columbia, Missouri 65202, USA; Lab Study No. 69725; DAS Study No. 130733; 12 January 2015; Unpublished
[5] Jones, R.R., Boesten, J.J.T.I., Klein, M. and van der Berg, E. (2011): Performance of the FOCUS 2010 Software Packages for Performing Tier 1 Ground Water Assessments in the EU.

Crop (use)	**Scenario**	**80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)**					
		PUF 0			**~~PUF 0.5~~**		
		An-nual	**Bien-nial**	**Trien-nial**	**An-nual**	**~~Bien-nial~~**	**~~Trien-nial~~**
	Thiva	0.002 0.001	-	-	-	-	-
Sugar beets 1 × 120 g a.e./ha BBCH 31	Châteaudun	0.115	0.062	-	~~0.071~~	-	-
	Hamburg	0.201	0.083	-	~~0.127~~	~~0.053~~	-
	Jokioinen	0.239	0.101	0.076	~~0.161~~	~~0.067~~	-
	Kremsmünster	0.051	-	-	-	-	-
	Okehampton	0.045	-	-	-	-	-
	Piacenza	0.003	-	-	-	-	-
	Porto	0.009	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	0.001	-	-	-	-	-
Sugar beets 1 × 120 g a.e./ha BBCH 39 (1-Jul)	Châteaudun	0.136	0.065	-	~~0.096~~	-	-
	Hamburg	0.209	0.086	-	~~0.133~~	~~0.055~~	-
	Jokioinen	0.185	0.079	-	~~0.119~~	~~0.049~~	-
	Kremsmünster	0.054	-	-	-	-	-
	Okehampton	0.052	-	-	-	-	-
	Piacenza	0.004	-	-	-	-	-
	Porto	0.001	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	0.002	-	-	-	-	-
Sugar beets 1 × 100 g a.e./ha BBCH 12	Châteaudun	0.125	0.059	-	~~0.066~~	-	-
	Hamburg	0.094	-	-	-	-	-
	Jokioinen	0.209	0.109	0.085	~~0.107~~	~~0.056~~	-
	Kremsmünster	0.049	-	-	-	-	-
	Okehampton	0.054	-	-	-	-	-
	Piacenza	0.023	-	-	-	-	-
	Porto	0.033	-	-	-	-	-
	Sevilla	0.441	0.155	0.052	~~0.390~~	~~0.145~~	~~0.049~~
	Thiva	0.001	-	-	-	-	-
Sugar beets 1 × 100 g a.e./ha BBCH 31	Châteaudun	0.095	-	-	-	-	-
	Hamburg	0.165	0.068	-	~~0.105~~	~~0.043~~	-
	Jokioinen	0.193	0.082	-	~~0.130~~	~~0.055~~	-

Crop (use)	**Scenario**	**80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)**					
		PUF 0			**~~PUF 0.5~~**		
		An-nual	**Bien-nial**	**Trien-nial**	**An-nual**	**~~Bien-nial~~**	**~~Trien-nial~~**
	Kremsmünster	0.042	-	-	-	-	-
	Okehampton	0.037	-	-	-	-	-
	Piacenza	0.003	-	-	-	-	-
	Porto	0.008	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	0.001	-	-	-	-	-
Sugar beets 1 × 100 g a.e./ha BBCH 39 (1-Jul)	Châteaudun	0.112	0.054	-	~~0.079~~	-	-
	Hamburg	0.172	0.071	-	~~0.110~~	~~0.045~~	-
	Jokioinen	0.149	0.064	-	~~0.096~~	-	-
	Kremsmünster	0.045	-	-	~~-~~	~~-~~	~~-~~
	Okehampton	0.043	-	-	-	-	-
	Piacenza	0.003	-	-	-	-	-
	Porto	0.001	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	0.002	-	-	~~-~~	~~-~~	~~-~~
Sugar beets 2 × 60 g a.e./ha BBCH 12 (7 d interval)	Châteaudun	0.177	0.084	-	~~0.096~~	-	-
	Hamburg	0.126	0.070	-	~~0.055~~	-	-
	Jokioinen	0.290	0.153	0.120	~~0.158~~	~~0.082~~	-
	Kremsmünster	0.064	-	-	-	-	-
	Okehampton	0.074	-	-	-	-	-
	Piacenza	0.020	-	-	-	-	-
	Porto	0.047	-	-	-	-	-
	Sevilla	0.578	0.185	0.056	~~0.543~~	~~0.176~~	~~0.053~~
	Thiva	0.002	-	-	-	-	-
Sugar beets 2 × 60 g a.e./ha BBCH 15 + 31 (1st app. at BBCH 15 2nd app. at BBCH 31)	Châteaudun	0.136	0.072	-	~~0.079~~	-	-
	Hamburg	0.174	0.083	-	~~0.098~~	-	-
	Jokioinen	0.285	0.138	0.103	~~0.174~~	~~0.084~~	-
	Kremsmünster	0.049	-	-	~~-~~	~~-~~	~~-~~
	Okehampton	0.074	-	-	~~-~~	~~-~~	~~-~~
	Piacenza	0.008	-	-	-	-	-
	Porto	0.024	-	-	-	-	-

Crop (use)	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
	Sevilla	0.119	0.023	-	~~0.110~~	~~0.018~~	-
	Thiva	0.002	-	-	-	-	-

Table 8.8-5 PEC_{gw} of clopyralid following application to oil seed rape, winter (FOCUS PEARL 4.4.4)

Crop (use)	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
Oil seed rape, winter 1 × 120 g a.e./ha BBCH 30	Châteaudun	0.005	-	-	-	-	-
	Hamburg	0.054	-	-	-	-	-
	Kremsmünster	0.057	-	-	-	-	-
	Okehampton	0.046	-	-	-	-	-
	Piacenza	0.012	-	-	-	-	-
	Porto	0.482	0.227	0.164	~~0.465~~	~~0.220~~	~~0.158~~
Oil seed rape, winter 1 × 120 g a.e./ha BBCH 50	Châteaudun	0.005	-	-	-	-	-
	Hamburg	0.067	-	-	-	-	-
	Kremsmünster	0.045	-	-	-	-	-
	Okehampton	0.068	-	-	-	-	-
	Piacenza	0.012	-	-	-	-	-
	Porto	0.050	-	-	-	-	-

Table 8.8-6 PEC_{gw} of clopyralid following application to linseed (FOCUS PEARL 4.4.4)

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)
		PUF 0, annual
Linseed 1 × 120 g a.e./ha BBCH 12	Okehampton	0.046
Linseed 1 × 120 g a.e./ha BBCH 32	Okehampton	0.038

Table 8.8-7 PEC_{gw} of clopyralid following application to maize (FOCUS PEARL 4.4.4)

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
Maize 1 × 100 g a.e./ha BBCH 10	Châteaudun	0.015	-	-	-	-	-
	Hamburg	0.112	0.062	-	~~0.051~~	-	-
	Kremsmünster	0.054	-	-	-	-	-
	Okehampton	0.094	-	-	-	-	-
	Piacenza	0.005	-	-	-	-	-
	Porto	0.001	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
Maize BBCH 32 1 × 100 g a.e./ha	Châteaudun	0.028	-	-	-	-	-
	Hamburg	0.182	0.088	-	~~0.106~~	~~0.051~~	-
	Kremsmünster	0.067	-	-	-	-	-
	Okehampton	0.098	-	-	-	-	-
	Piacenza	0.006	-	-	-	-	-
	Porto	0.002	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	0.001	-	-	-	-	-

Table 8.8-8 PEC_{gw} of clopyralid following application to grass/alfalfa (>1 year) (FOCUS PEARL 4.4.4)

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
Grass/alfalfa (>1 year) 1 × 200 g a.e/ha	**1 March**						
	Châteaudun	0.008	-	-	-	-	-
	Hamburg	0.026	-	-	-	-	-
	Jokioinen	0.125	0.069	-	~~0.062~~	-	-
	Kremsmünster	0.017	-	-	-	-	-
	Okehampton	0.060	-	-	-	-	-

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
	Piacenza	0.034	-	-	-	-	-
	Porto	0.012	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 April						
	Châteaudun	0.008	-	-	-	-	-
	Hamburg	0.018	-	-	-	-	-
	Jokioinen	0.083	-	-	-	-	-
	Kremsmünster	0.014	-	-	-	-	-
	Okehampton	0.016	-	-	-	-	-
	Piacenza	0.016	-	-	-	-	-
	Porto	0.005	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 May						
	Châteaudun	0.007	-	-	-	-	-
	Hamburg	0.030	-	-	-	-	-
	Jokioinen	0.058	-	-	-	-	-
	Kremsmünster	0.014	-	-	-	-	-
	Okehampton	0.016	-	-	-	-	-
	Piacenza	0.007	-	-	-	-	-
	Porto	0.001	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 June						
	Châteaudun	0.004	-	-	-	-	-
	Hamburg	0.048	-	-	-	-	-
	Jokioinen	0.109	0.042	-	~~0.043~~	-	-
	Kremsmünster	0.011	-	-	-	-	-
	Okehampton	0.027	-	-	-	-	-
	Piacenza	0.003	-	-	-	-	-

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
	Porto	0.001	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 July						
	Châteaudun	0.007	-	-	-	-	-
	Hamburg	0.102	0.036	-	~~0.059~~	-	-
	Jokioinen	0.099	0.045	-	~~0.063~~	-	-
	Kremsmünster	0.019	-	-	-	-	-
	Okehampton	0.026	-	-	-	-	-
	Piacenza	0.002	-	-	-	-	-
	Porto	0.001	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 August						
	Châteaudun	0.013	-	-	-	-	-
	Hamburg	0.207	0.097	-	~~0.154~~	~~0.071~~	-
	Jokioinen	0.266	0.139	0.105	~~0.191~~	~~0.104~~	~~0.074~~
	Kremsmünster	0.033	-	-	-	-	-
	Okehampton	0.042	-	-	-	-	-
	Piacenza	0.017	-	-	-	-	-
	Porto	0.005	-	-	-	-	-
	Sevilla	0.001	-	-	-	-	-
	Thiva	0.001	-	-	-	-	-
Grass/alfalfa (>1 year) 1 × 120 g a.e/ha	1 **March**						
	Châteaudun	0.004	-	-	-	-	-
	Hamburg	0.015	-	-	-	-	-
	Jokioinen	0.069	-	-	-	-	-
	Kremsmünster	0.009	-	-	-	-	-
	Okehampton	0.034	-	-	-	-	-
	Piacenza	0.020	-	-	-	-	-
	Porto	0.007	-	-	-	-	-

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 April						
	Châteaudun	0.005	-	-	-	-	-
	Hamburg	0.010	-	-	-	-	-
	Jokioinen	0.046	-	-	-	-	-
	Kremsmünster	0.008	-	-	-	-	-
	Okehampton	0.009	-	-	-	-	-
	Piacenza	0.009	-	-	-	-	-
	Porto	0.003	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 May						
	Châteaudun	0.004	-	-	-	-	-
	Hamburg	0.017	-	-	-	-	-
	Jokioinen	0.031	-	-	-	-	-
	Kremsmünster	0.008	-	-	-	-	-
	Okehampton	0.009	-	-	-	-	-
	Piacenza	0.004	-	-	-	-	-
	Porto	<0.001	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 June						
	Châteaudun	0.002	-	-	-	-	-
	Hamburg	0.027	-	-	-	-	-
	Jokioinen	0.055	-	-	-	-	-
	Kremsmünster	0.006	-	-	-	-	-
	Okehampton	0.015	-	-	-	-	-
	Piacenza	0.002	-	-	-	-	-
	Porto	<0.001	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
	Thiva	<0.001	-	-	-	-	-
	1 July						
	Châteaudun	0.004	-	-	-	-	-
	Hamburg	0.056	-	-	-	-	-
	Jokioinen	0.054	-	-	-	-	-
	Kremsmünster	0.011	-	-	-	-	-
	Okehampton	0.015	-	-	-	-	-
	Piacenza	0.001	-	-	-	-	-
	Porto	<0.001	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 August						
	Châteaudun	0.007	-	-	-	-	-
	Hamburg	0.119	0.055	-	~~0.089~~	-	-
	Jokioinen	0.145	0.078	-	~~0.108~~	~~0.057~~	-
	Kremsmünster	0.019	-	-	-	-	-
	Okehampton	0.024	-	-	-	-	-
	Piacenza	0.010	-	-	-	-	-
	Porto	0.003	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 September						
	Châteaudun	0.025	-	-	-	-	-
	Hamburg	0.298	0.154	0.092	~~0.277~~	~~0.139~~	~~0.083~~
	Jokioinen	0.464	0.257	0.159	~~0.408~~	~~0.212~~	~~0.151~~
	Kremsmünster	0.055	-	-	-	-	-
	Okehampton	0.102	0.057	-	~~0.089~~	-	-
	Piacenza	0.040	-	-	-	-	-
	Porto	0.032	-	-	-	-	-
	Sevilla	0.001	-	-	-	-	-
	Thiva	0.004	-	-	-	-	-

Table 8.8-9 PEC_{gw} of clopyralid following application to grass/alfalfa (<1 year) (FOCUS PEARL 4.4.4)

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
Grass/alfalfa (<1 year) 1 × 120 g a.e./ha	**1 March**						
	Châteaudun	0.031	-	-	-	-	-
	Hamburg	0.106	0.061	-	~~0.055~~	~~0.028~~	-
	Jokioinen	0.531	0.293	0.209	~~0.247~~	~~0.119~~	~~0.075~~
	Kremsmünster	0.068	-	-	-	-	-
	Okehampton	0.238	0.121	0.084	~~0.197~~	~~0.102~~	~~0.070~~
	Piacenza	0.137	0.065	-	~~0.116~~	~~0.052~~	-
	Porto	0.053	-	-	-	-	-
	Sevilla	0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 April						
	Châteaudun	0.034	-	-	-	-	-
	Hamburg	0.071	-	-	-	-	-
	Jokioinen	0.359	0.199	0.151	~~0.150~~	~~0.082~~	~~0.056~~
	Kremsmünster	0.056	-	-	-	-	-
	Okehampton	0.067	-	-	-	-	-
	Piacenza	0.062	-	-	-	-	-
	Porto	0.019	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 May						
	Châteaudun	0.030	-	-	-	-	-
	Hamburg	0.120	0.065	-	~~0.057~~	-	-
	Jokioinen	0.315	0.160	0.108	~~0.130~~	~~0.089~~	~~0.060~~
	Kremsmünster	0.055	-	-	-	-	-
	Okehampton	0.065	-	-	-	-	-

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
	Piacenza	0.029	-	-	-	-	-
	Porto	0.006	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 June						
	Châteaudun	0.016	-	-	-	-	-
	Hamburg	0.193	0.095	0.065	~~0.103~~	~~0.051~~	~~0.037~~
	Jokioinen	0.478	0.181	0.145	~~0.182~~	~~0.114~~	~~0.092~~
	Kremsmünster	0.045	-	-	-	-	-
	Okehampton	0.104	0.057	-	~~0.079~~	-	-
	Piacenza	0.013	-	-	-	-	-
	Porto	0.003	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 July						
	Châteaudun	0.027	-	-	-	-	-
	Hamburg	0.446	0.147	0.103	~~0.250~~	~~0.085~~	~~0.059~~
	Jokioinen	0.426	0.196	0.156	~~0.264~~	~~0.126~~	~~0.080~~
	Kremsmünster	0.076	-	-	-	-	-
	Okehampton	0.101	0.054	-	~~0.077~~	-	-
	Piacenza	0.008	-	-	-	-	-
	Porto	0.005	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	0.001	-	-	-	-	-

Table 8.8-10 PEC_{gw} of clopyralid following application to onions (FOCUS PEARL 4.4.4)

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~

Onions 1 × 120 g a.e./ha BBCH 11	Châteaudun	0.013	-	-	-	-	-
	Hamburg	0.113	0.064	-	~~0.061~~	-	-
	Jokioinen	0.164	0.092	-	~~0.077~~	-	-
	Kremsmünster	0.052	-	-	-	-	-
	Porto	0.046	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-

Table 8.8-11 PEC_{gw} of clopyralid following application to winter cereals (FOCUS PEARL 4.4.4)

Crop	**Scenario**	**80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)**
		PUF 0
		Annual
Winter cereals 1 × 90 g a.e./ha BBCH 30 - 39	Châteaudun	0.001
	Hamburg	0.043
	Jokioinen	0.035
	Kremsmünster	0.024
	Okehampton	0.038
	Piacenza	0.014
	Porto	0.088
	Sevilla	0.000
	Thiva	0.001

Table 8.8-12 PEC_{gw} of clopyralid following application to spring cereals (FOCUS PEARL 4.4.4)

Crop	**Scenario**	**80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)**
		PUF 0
		Annual
Spring cereals 1 × 120 g a.e./ha BBCH 30 - 39	Châteaudun	0.001
	Hamburg	0.061
	Jokioinen	0.068
	Kremsmünster	0.029
	Okehampton	0.026
	Porto	0.001

FOCUS PELMO

Table 8.8-13: PEC_{gw} of clopyralid following application to sugar beets (FOCUS PELMO 5.5.3)

Crop (use)	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
Sugar beets 1 × 120 g a.e./ha BBCH 12 the PECgw values calculated using the latest versions of FOCUS PEARL 5.5.5 and FOCUS PELMO 6.6.4 was highlighted in yellow	Châteaudun	0.031 0.030	-	-	-	-	-
	Hamburg	0.036 0.036	-	-	-	-	-
	Jokioinen	0.340 0.337	0.212 0.210	0.123 0.121	~~0.130~~	~~0.080~~	-
	Kremsmünster	0.070 0.070	-	-	-	-	-
	Okehampton	0.118 0.118	0.069 0.069	-	~~0.084~~	-	-
	Piacenza	0.180 0.169	0.096 0.089	0.072 0.064	~~0.132~~	~~0.069~~	-
	Porto	0.462 0.494	0.142 0.142	0.107 0.107	~~0.349~~	~~0.098~~	-
	Sevilla	0.993 0.996	0.443 0.443	0.171 0.171	~~0.879~~	~~0.383~~	~~0.142~~
	Thiva	<0.001 <0.001	-	-	-	-	-
Sugar beets 1 × 120 g a.e./ha BBCH 31	Châteaudun	0.023	-	-	-	-	-
	Hamburg	0.076	-	-	-	-	-
	Jokioinen	0.164	0.092	-	~~0.086~~	-	-
	Kremsmünster	0.063	-	-	-	-	-
	Okehampton	0.074	-	-	-	-	-
	Piacenza	0.013	-	-	-	-	-
	Porto	0.042	-	-	-	-	-
	Sevilla	0.005	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
Sugar beets 1 × 120 g a.e./ha BBCH 39 (1-Jul)	Châteaudun	0.031	-	-	-	-	-
	Hamburg	0.073	-	-	-	-	-
	Jokioinen	0.128	0.067	-	~~0.063~~	-	-
	Kremsmünster	0.066	-	-	-	-	-

Crop (use)	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
	Okehampton	0.074	-	-	-	-	-
	Piacenza	0.004	-	-	-	-	-
	Porto	0.002	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	0.001	-	-	-	-	-
Sugar beets 1 × 100 g a.e./ha BBCH 12	Châteaudun	0.025	-	-	-	-	-
	Hamburg	0.030	-	-	-	-	-
	Jokioinen	0.278	0.173	0.100	~~0.108~~	~~0.066~~	-
	Kremsmünster	0.058	-	-	-	-	-
	Okehampton	0.097	-	-	-	-	-
	Piacenza	0.148	0.078	-	~~0.109~~	~~0.057~~	-
	Porto	0.377	0.116	0.088	~~0.285~~	~~0.080~~	-
	Sevilla	0.821	0.365	0.141	~~0.726~~	~~0.317~~	~~0.117~~
	Thiva	<0.001	-	-	-	-	-
Sugar beets 1 × 100 g a.e./ha BBCH 31	Châteaudun	0.019	-	-	-	-	-
	Hamburg	0.062	-	-	-	-	-
	Jokioinen	0.133	0.075	-	~~0.071~~	-	-
	Kremsmünster	0.052	-	-	-	-	-
	Okehampton	0.061	-	-	-	-	-
	Piacenza	0.010	-	-	-	-	-
	Porto	0.034	-	-	-	-	-
	Sevilla	0.004	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
Sugar beets 1 × 100 g a.e./ha BBCH 39 (1-Jul)	Châteaudun	0.025	-	-	-	-	-
	Hamburg	0.060	-	-	-	-	-
	Jokioinen	0.103	0.055	-	~~0.052~~	-	
	Kremsmünster	0.054	-	-	-	-	-
	Okehampton	0.061	-	-	-	-	-
	Piacenza	0.004	-	-	-	-	-
	Porto	0.001	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-

Crop (use)	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
	Thiva	0.001	-	-	-	-	-
Sugar beets 2 × 60 g a.e./ha (7 d interval) BBCH 12	Châteaudun	0.034	-	-	-	-	-
	Hamburg	0.037	-	-	-	-	-
	Jokioinen	0.379	0.237	0.137	~~0.169~~	~~0.104~~	~~0.060~~
	Kremsmünster	0.075	-	-	-	-	-
	Okehampton	0.134	0.069	-	~~0.056~~	-	-
	Piacenza	0.197	0.092	-	~~0.130~~	~~0.064~~	-
	Porto	0.409	0.149	0.096	~~0.299~~	~~0.101~~	~~0.070~~
	Sevilla	0.984	0.440	0.182	~~0.875~~	~~0.394~~	~~0.165~~
	Thiva	<0.001	-	-	-	-	-
Sugar beets 2 × 60 g a.e./ha BBCH 15 + 31 (1st app. at BBCH 15 2nd app. at BBCH 31)	Châteaudun	0.031	-	-	-	-	-
	Hamburg	0.061	-	-	-	-	-
	Jokioinen	0.268	0.141	0.098	~~0.124~~	~~0.067~~	-
	Kremsmünster	0.051	-	-	-	-	-
	Okehampton	0.104	0.049	-	~~0.063~~	-	-
	Piacenza	0.051	-	-	-	-	-
	Porto	0.174	0.064	-	~~0.135~~	~~0.047~~	-
	Sevilla[a]	0.357	0.175	0.069	~~0.279~~	~~0.116~~	~~0.053~~
	Thiva	0.001	-	-	-	-	-

[a] the AppDate v3.06 recommended application dates for BBCH 15 and BBCH 31 are 20th December and 4th February, respectively. As this application sequence could not be implemented in PELMO, the second application date for the Sevilla scenario was set 27th December (7d interval).

Table 8.8-14 PEC_{gw} of clopyralid following application to oil seed rape, winter (FOCUS PELMO 5.5.3)

Crop (use)	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
Oil seed rape, winter 1 × 120 g a.e./ha BBCH 30	Châteaudun	0.005	-	-	-	-	-
	Hamburg	0.018	-	-	-	-	-
	Kremsmünster	0.052	-	-	-	-	-

	Okehampton	0.051	-	-	-	-	-
	Piacenza	0.028	-	-	-	-	-
	Porto	0.947	0.478	0.336	~~0.879~~	~~0.458~~	~~0.322~~
Oil seed rape, winter 1 × 120 g a.e./ha BBCH 50	Châteaudun	0.003	-	-	-	-	-
	Hamburg	0.017	-	-	-	-	-
	Kremsmünster	0.038	-	-	-	-	-
	Okehampton	0.067	-	-	-	-	-
	Piacenza	0.025	-	-	-	-	-
	Porto	0.173	0.121	0.087	~~0.154~~	~~0.108~~	~~0.078~~

Table 8.8-15 PEC$_{gw}$ of clopyralid following application to linseed (FOCUS PELMO 5.5.3)

Crop	**Scenario**	**80th Percentile PEC$_{gw}$ at 1 m Soil Depth (µg/L)**
		PUF 0, annual
Linseed 1 × 120 g a.e./ha BBCH 12	Okehampton	0.080
Linseed 1 × 120 g a.e./ha BBCH 32	Okehampton	0.058

Table 8.8-16 PEC$_{gw}$ of clopyralid following application to maize (FOCUS PELMO 5.5.3)

Crop	**Scenario**	**80th Percentile PEC$_{gw}$ at 1 m Soil Depth (µg/L)**					
		PUF 0			**~~PUF 0.5~~**		
		Annual	**Biennial**	**Triennial**	**~~Annual~~**	**Biennial**	**Triennial**
Maize 1 × 100 g a.e./ha BBCH 10	Châteaudun	0.007	-	-	-	-	-
	Hamburg	0.030	-	-	-	-	-
	Kremsmün-ster	0.060	-	-	-	-	-
	Okehampton	0.119	0.071	-	~~0.061~~	-	-
	Piacenza	0.014	-	-	-	-	-
	Porto	0.002	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
Maize 1 × 100 g a.e./ha	Châteaudun	0.011	-	-	-	-	-
	Hamburg	0.062	-	-	-	-	-

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	Biennial	Triennial
BBCH 32	Kremsmün-ster	0.058	-	-	-	-	-
	Okehampton	0.111	0.053	-	~~0.059~~	-	
	Piacenza	0.015	-	-	-	-	-
	Porto	0.001	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-

Table 8.8-17 PEC_{gw} of clopyralid following application to grass/alfalfa (>1 year) (FOCUS PELMO 5.5.3)

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
Grass/alfalfa (>1 year) 1 × 200 g a.e/ha	**1 March**						
	Châteaudun	0.003	-	-	-	-	-
	Hamburg	0.060	-	-	-	-	-
	Jokioinen	0.450	0.239	0.195	~~0.299~~	~~0.153~~	~~0.115~~
	Kremsmünster	0.018	-	-	-	-	-
	Okehampton	0.100	0.054	-	~~0.081~~	-	-
	Piacenza	0.171	0.107	0.080	~~0.139~~	~~0.084~~	-
	Porto	0.073	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 April						
	Châteaudun	0.002	-	-	-	-	-
	Hamburg	0.015	-	-	-	-	-
	Jokioinen	0.136	0.081	-	~~0.060~~	-	-
	Kremsmünster	0.014	-	-	-	-	-
	Okehampton	0.022	-	-	-	-	-
	Piacenza	0.086	-	-	-	-	-

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
	Porto	0.026	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 May						
	Châteaudun	0.004	-	-	-	-	-
	Hamburg	0.007	-	-	-	-	-
	Jokioinen	0.051	-	-	-	-	-
	Kremsmünster	0.013	-	-	-	-	-
	Okehampton	0.028	-	-	-	-	-
	Piacenza	0.032	-	-	-	-	-
	Porto	0.005	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 June						
	Châteaudun	0.003	-	-	-	-	-
	Hamburg	0.013	-	-	-	-	-
	Jokioinen	0.071	-	-	-	-	-
	Kremsmünster	0.011	-	-	-	-	-
	Okehampton	0.032	-	-	-	-	-
	Piacenza	0.007	-	-	-	-	-
	Porto	0.001	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 July						
	Châteaudun	0.005	-	-	-	-	-
	Hamburg	0.033	-	-	-	-	-
	Jokioinen	0.073	-	-	-	-	-
	Kremsmünster	0.027	-	-	-	-	-
	Okehampton	0.033	-	-	-	-	-
	Piacenza	0.004	-	-	-	-	-
	Porto	0.001	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
	Thiva	<0.001	-	-	-	-	-
	1 August						
	Châteaudun	0.010	-	-	-	-	-
	Hamburg	0.054	-	-	-	-	-
	Jokioinen	0.229	0.100	0.075	~~0.153~~	~~0.073~~	~~0.074~~
	Kremsmünster	0.037	-	-	-	-	-
	Okehampton	0.030	-	-	-	-	-
	Piacenza	0.020	-	-	-	-	-
	Porto	0.004	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	0.001	-	-	-	-	-
Grass/alfalfa (>1 year) 1 × 120 g a.e/ha	**1 March**						
	Châteaudun	0.002	-	-	-	-	-
	Hamburg	0.034	-	-	-	-	-
	Jokioinen	0.248	0.132	0.109	~~0.163~~	~~0.084~~	-
	Kremsmünster	0.010	-	-	-	-	-
	Okehampton	0.057	-	-	-	-	-
	Piacenza	0.010	0.063	0.047	~~0.081~~	-	-
	Porto	0.041	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 April						
	Châteaudun	0.001	-	-	-	-	-
	Hamburg	0.009	-	-	-	-	-
	Jokioinen	0.075	-	-	-	-	-
	Kremsmünster	0.008	-	-	-	-	-
	Okehampton	0.013	-	-	-	-	-
	Piacenza	0.049	-	-	-	-	-
	Porto	0.014	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
	1 May						
	Châteaudun	0.002	-	-	-	-	-
	Hamburg	0.004	-	-	-	-	-
	Jokioinen	0.029	-	-	-	-	-
	Kremsmünster	0.008	-	-	-	-	-
	Okehampton	0.016	-	-	-	-	-
	Piacenza	0.018	-	-	-	-	-
	Porto	0.003	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 June						
	Châteaudun	0.002	-	-	-	-	-
	Hamburg	0.007	-	-	-	-	-
	Jokioinen	0.040	-	-	-	-	-
	Kremsmünster	0.006	-	-	-	-	-
	Okehampton	0.018	-	-	-	-	-
	Piacenza	0.004	-	-	-	-	-
	Porto	<0.001	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 July						
	Châteaudun	0.003	-	-	-	-	-
	Hamburg	0.019	-	-	-	-	-
	Jokioinen	0.040	-	-	-	-	-
	Kremsmünster	0.015	-	-	-	-	-
	Okehampton	0.019	-	-	-	-	-
	Piacenza	0.003	-	-	-	-	-
	Porto	0.001	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 August						
	Châteaudun	0.006	-	-	-	-	-

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
	Hamburg	0.031	-	-	-	-	-
	Jokioinen	0.129	0.057	-	~~0.086~~	-	-
	Kremsmünster	0.022	-	-	-	-	-
	Okehampton	0.017	-	-	-	-	-
	Piacenza	0.011	-	-	-	-	-
	Porto	0.003	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	0.001	-	-	-	-	-
	1 September						
	Châteaudun	0.017	-	-	-	-	-
	Hamburg	0.136	0.066	-	~~0.084~~	-	-
	Jokioinen	0.508	0.283	0.192	~~0.404~~	~~0.197~~	~~0.140~~
	Kremsmünster	0.072	-	-	-	-	-
	Okehampton	0.099	-	-	-	-	-
	Piacenza	0.033	-	-	-	-	-
	Porto	0.033	-	-	-	-	-
	Sevilla	0.001	-	-	-	-	-
	Thiva	0.004	-	-	-	-	-

Table 8.8-18 PEC_{gw} of clopyralid following application to grass/alfalfa (<1 year) (FOCUS PELMO 5.5.3)

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
Grass/alfalfa (<1 year) 1 × 120 g a.e/ha	**1 March**						
	Châteaudun	0.012	-	-	-	~~0.004~~	-
	Hamburg	0.240	0.122	0.097	~~0.117~~	~~0.065~~	~~0.046~~
	Jokioinen	1.958	1.027	0.830	~~1.320~~	~~0.664~~	~~0.486~~

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
	Kremsmünster	0.073	-	-	-	-	-
	Okehampton	0.400	0.216	0.150	~~0.324~~	~~0.169~~	~~0.125~~
	Piacenza	0.660	0.411	0.306	~~0.534~~	~~0.320~~	~~0.244~~
	Porto	0.297	0.130	0.092	~~0.240~~	~~0.109~~	~~0.077~~
	Sevilla	0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 April						
	Châteaudun	0.010	-	-	-	-	-
	Hamburg	0.063	-	-	-	-	-
	Jokioinen	0.580	0.354	0.225	~~0.246~~	~~0.150~~	~~0.096~~
	Kremsmünster	0.060	-	-	-	-	-
	Okehampton	0.090	-	-	-	-	-
	Piacenza	0.338	0.153	0.114	~~0.255~~	~~0.120~~	~~0.083~~
	Porto	0.111	0.041	-	~~0.084~~	-	-
	Sevilla	0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 May						
	Châteaudun	0.015	-	-	-	-	-
	Hamburg	0.028	-	-	-	-	-
	Jokioinen	0.215	0.133	0.088	~~0.084~~	-	-
	Kremsmünster	0.051	-	-	-	-	-
	Okehampton	0.113	0.055	-	~~0.057~~	-	-
	Piacenza	0.126	0.059	-	~~0.094~~	-	-
	Porto	0.022	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 June						
	Châteaudun	0.012	-	-	-	-	-
	Hamburg	0.055	-	-	-	-	-
	Jokioinen	0.295	0.194	0.121	~~0.140~~	~~0.093~~	-
	Kremsmünster	0.044	-	-	-	-	-

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
	Okehampton	0.127	0.078	-	~~0.078~~	-	-
	Piacenza	0.029	-	-	-	-	-
	Porto	0.004	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-
	1 July						
	Châteaudun	0.019	-	-	-	-	-
	Hamburg	0.131	0.072	-	~~0.073~~	-	-
	Jokioinen	0.306	0.157	0.111	~~0.192~~	~~0.097~~	-
	Kremsmünster	0.105	0.076	-	~~0.070~~	-	-
	Okehampton	0.129	0.054	-	~~0.087~~	-	-
	Piacenza	0.018	-	-	-	-	-
	Porto	0.005	-	-	-	-	-
	Sevilla	<0.001	-	-	-	-	-
	Thiva	<0.001	-	-	-	-	-

Table 8.8-19 PEC_{gw} of clopyralid following application to onions (FOCUS PELMO 5.5.3)

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)					
		PUF 0			~~PUF 0.5~~		
		Annual	Biennial	Triennial	~~Annual~~	~~Biennial~~	~~Triennial~~
Onions BBCH 11 1 × 120 g a.e./ha	Châteaudun	0.012	-	-	-	-	-
	Hamburg	0.039	-	-	-	-	-
	Jokioinen	0.220	0.113	0.073	~~0.092~~	-	-
	Kremsmünster	0.059	-	-	-	-	-
	Porto	0.147	0.060	-	~~0.123~~	~~0.048~~	-
	Thiva	<0.001	-	-	-	-	-

Table 8.8-20 PEC_{gw} of clopyralid following application to winter cereals (FOCUS PELMO 5.5.3)

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)	
		PUF 0	~~PUF 0.5~~
		Annual	~~Annual~~
Winter cereals 1 × 90 g a.e./ha BBCH 30 - 39	Châteaudun	0.001	-
	Hamburg	0.007	-
	Jokioinen	0.045	-
	Kremsmünster	0.024	-
	Okehampton	0.038	-
	Piacenza	0.027	-
	Porto	0.369	~~0.342~~
	Sevilla	0.003	-
	Thiva	0.011	-

Table 8.8-21 PEC_{gw} of clopyralid following application to spring cereals (FOCUS PELMO 5.5.3)

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)
		PUF 0
		Annual
Spring cereals BBCH 30 - 39 1 × 120 g a.e./ha	Châteaudun	<0.001
	Hamburg	0.009
	Jokioinen	0.085
	Kremsmünster	0.023
	Okehampton	0.030
	Porto	0.002

FOCUS MACRO

Table 8.8-22: PEC_{gw} of clopyralid following application to sugar beets (FOCUS MACRO 5.5.4)

Crop (use)	**Scenario**	**80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)**
		PUF 0
		Annual
Sugar beets 1 × 120 g a.e./ha BBCH 12	Châteaudun	0.032
Sugar beets 1 × 120 g a.e./ha BBCH 31	Châteaudun	0.014
Sugar beets 1 × 120 g a.e./ha BBCH 39 (1-Jul)	Châteaudun	0.023
Sugar beets 1 × 100 g a.e./ha BBCH 12	Châteaudun	0.027
Sugar beets 1 × 100 g a.e./ha BBCH 31	Châteaudun	0.012
Sugar beets 1 × 100 g a.e./ha BBCH 39 (1-Jul)	Châteaudun	0.019
Sugar beets 2 × 60 g a.e./ha BBCH 12 (7 d interval)	Châteaudun	0.036
Sugar beets 2 × 60 g a.e./ha BBCH 15 + 31 (1st app. at BBCH 15 2nd app. at BBCH 31)	Châteaudun	0.023

Table 8.8-23 PEC_{gw} of clopyralid following application to oil seed rape, winter (FOCUS MACRO 5.5.4)

Crop (use)	**Scenario**	**80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)**
		PUF 0
		Annual
Winter oil seed rape 1 × 120 g a.e./ha BBCH 30	Châteaudun	0.002

Winter oil seed rape 1 × 120 g a.e./ha BBCH 50	Châteaudun	<0.001

Table 8.8-24 PEC$_{gw}$ of clopyralid following application to linseed[a] (FOCUS MACRO 5.5.4)

Crop	**Scenario**	**80th Percentile PEC$_{gw}$ at 1 m Soil Depth (µg/L)**
		PUF 0
		Annual
Linseed 1 × 120 g a.e./ha BBCH 12[b]	Châteaudun	0.007
Linseed 1 × 120 g a.e./ha BBCH 32	Châteaudun	0.004

[a] maize used as surrogate model crop
[b] also covers BBCH 15

Table 8.8-25 PEC$_{gw}$ of clopyralid following application to maize (FOCUS MACRO 5.5.4)

Crop	**Scenario**	**80th Percentile PEC$_{gw}$ at 1 m Soil Depth (µg/L)**
		PUF 0
		Annual
Maize 1 × 100 g a.e./ha BBCH 12	Châteaudun	0.008
Maize 1 × 100 g a.e./ha BBCH 32	Châteaudun	0.004

Table 8.8-26 PEC_{gw} of clopyralid following application to grass/alfalfa (>1 year) (FOCUS MACRO 5.5.4)

Crop	Scenario	80^{th} Percentile PEC_{gw} at 1 m Soil Depth (µg/L)
		PUF 0
		Annual
Grass/alfalfa (>1 year) 1 × 200 g a.e./ha	**1 March**	
	Châteaudun	0.003
	1 April	
	Châteaudun	0.002
	1 May	
	Châteaudun	0.001
	1 June	
	Châteaudun	0.001
	1 July	
	Châteaudun	0.002
	1 August	
	Châteaudun	0.008
Grass/alfalfa (>1 year) 1 × 120 g a.e./ha	**1 March**	
	Châteaudun	0.002
	1 April	
	Châteaudun	<0.001
	1 May	
	Châteaudun	<0.001
	1 June	
	Châteaudun	<0.001
	1 July	
	Châteaudun	0.001
	1 August	
	Châteaudun	0.005
	1 September	
	Châteaudun	0.020

Table 8.8-27 **PEC_{gw} of clopyralid following application to grass/alfalfa (<1 year) (FOCUS MACRO 5.5.4**

Crop	**Scenario**	**80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)**
		PUF 0
		Annual
Grass/alfalfa (<1 year) 1 × 120 g a.e./ha	**1 March**	
	Châteaudun	0.011
	1 April	
	Châteaudun	0.006
	1 May	
	Châteaudun	0.004
	1 June	
	Châteaudun	0.005
	1 July	
	Châteaudun	0.010

Table 8.8-28 **PEC_{gw} of clopyralid following application to vegetables, bulb (FOCUS MACRO 5.5.4)**

Crop	**Scenario**	**80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)**
		PUF 0
		Annual
Vegetables, bulb 1 × 120 g a.e/ha BBCH 11	Châteaudun	0.009

Table 8.8-29 **PEC_{gw} of clopyralid following application to winter cereals (FOCUS MACRO 5.5.4)**

Crop	**Scenario**	**80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)**
		PUF 0
		Annual
Winter cereals BBCH 30 - 39 1 × 120 g a.e/ha	Châteaudun	<0.001

Table 8.8-30 PEC_{gw} of clopyralid following application to spring cereals (FOCUS MACRO 5.5.4)

Crop	Scenario	80th Percentile PEC_{gw} at 1 m Soil Depth (µg/L)
		PUF 0
		Annual
Spring cereals BBCH 30 - 39 1 × 120 g a.e/ha	Châteaudun	<0.001

Evaluation by zRMS	PECgw (KCP 9.2.4)
Modelling	The applicant has used the following models for calculations of the PEC groundwater FOCUS-PEARL 4.4.4, FOCUS-PELMO 5.5.3 and FOCUS MACRO 5.5.4. Additionally, the applicant on the request of the zRMS provided the new PECgw calculations (highlighted in yellow) using the latest versions of FOCUS PEARL 5.5.5 and FOCUS PELMO 6.6.4 for sugar beets at an application rate of 120 g/ha at BBCH 12. It was selected as the example crop and GAP because it yielded some of the highest PECgw values over all the modelled GAPs using the older versions of the models i.e. FOCUS PEARL 4.4.4 and FOCUS PELMO 5.5.3. When comparing the data obtained from PEARL, the average % difference ranged from -3.6 to 3.3% for the three relevant scenarios for Poland (Châteaudun, Hamburg and Kremsmünster). Similarly, for PELMO, the average % difference ranged from -0.5 to 1.7% for the three mentioned scenarios. It demonstrated that the model version is not significantly impacting the calculated PECgw values. Thus, the results of the calculation of the PECgw values for clopyralid presented in Tables below can be accepted. Input parameters used in FOCUS ground water modelling for active substance clopyralid are correct. PUF values: The applicant has used PUF values 0 and 0.5 in the modelling. However, in accordance with LoEPs of EFSA Conclusion (2018), a PUF value 0 for Tier I and a PUF value of 0.000271 for Tier II are correctly. The value for Tier II was obtained using Briggs' equation. Therefore, the PECgw results based on PUF value of 0.5 have been crossed out from all PECgw summary tables.
PECgw	Results of modelling with FOCUS MACRO 5.5.4.show that the active substance clopyralid are not expected to penetrate into groundwater at concentrations of ≥ 0.1 µg/L in any of the intended uses for Châteaudun scenario. Results of modelling with FOCUS-PEARL 4.4.4, FOCUS-PELMO 5.5.3 show that the active substance clopyralid are not expected to penetrate into groundwater at concentrations of ≥ 0.1 µg/L for the three relevant scenarios for Poland, Czech Republic and Slovakia (Châteaudun, Hamburg and Kremsmünster) in the following uses in: - Oil seed rape with annual application - Linseed with annual application - Winter and spring cereals with annual application - Vegetables bulb/Onions with biennial application

	- Maize with biennial application - Grass/alfalfa (>1 year) 1 × 200 g a.e/ha with annual application apart the applications at 1 July and 1 August (for these date the biennial application is appropriate) - Grass/alfalfa (>1 year) 1 × 120 g a.e/ha with annual application apart the applications at 1 September (for this date the biennial application is appropriate) - Grass/alfalfa (<1 year) 1 × 120 g a.e./ha with annual application apart the applications at 1 March, 1 May, 1 June (for these date the biennial application is appropriate). However in one case the PECgw value received by using FOCUS-PEARL 4.4.4. model for application every 3rd year 1 × 120 g/ha in grass/alfalfa (<1 year) was equel 0.103 µg/L in Hamburg scenario. It indicates that the threshold of 0.1 µg/L has been slightly exceeded by the value of 0.003 µg/L. Such a small excess and the fact that the PECgw value calculated with the FOCUS-PELMO 5.5.3 model for the same scenario is below the value of 0.1 µg/L for the biennial application of Lontrel 300 SL can lead to the conclusion that the use of Lontrel 300 SL in Grass/alfalfa (<1 year) 1 × 120 g a.e./ha with the triennial application is appropriate and safe.

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

8.9.1 Justification for new endpoints

EU agreed endpoints were used for the PEC_{sw} and PEC_{sed} calculations of clopyralid (EFSA, 2018[1]).

8.9.2 Active substance and the formulation (KCP 9.2.5)

The following PEC_{sw} and PEC_{sed} modelling for clopyralid is provided in support of this assessment. For details please refer to Anagu and González Camarero, 2021 (Appendix 1). Only results most relevant to the current assessment are presented here.

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

Crop	Sugar beets		Oil seed rape, winter
Application rate (g a.e./ha)	120	60	120
Number of applications (-) / interval (d)	1 / -	2 / 7	1 / -
BBCH growth stage	12 – 39	12 – 15[b]	30 – 50
Application window	BBCH 12 (Appdate) + 30 days[a]	BBCH 12 (Appdate) + 30 days[a]	BBCH 30 (Appdate) + 30 days[a]

		BBCH 12 (Appdate) + 37 days[a]	
PHI (d)	42		-
Application period / region (relevant for STEP 1 and 2 only)	Northern Europe / Mar – May / Jun – Sep Southern Europe / Mar – May / Jun – Sep		Northern Europe / Oct – Feb / Mar – May / Jun – Sep Southern Europe / Oct – Feb / Mar – May / Jun – Sep
Interception class (relevant for STEP 2)	Minimal crop cover		Average crop cover
Application method	Ground spray		
CAM (Chemical application method)	2		
Soil depth (cm)	4		
Models used for calculation	STEPS 1-2 in FOCUS 3.2 FOCUS SPIN 2.2 FOCUS SWASH 5.3 (FOCUS PRZM 4.3.1, FOCUS MACRO 5.5.4, FOCUS TOXSWA 5.5.3)		

Crop	Maize[c]	Grass/alfalfa (>1 year)
Application rate (g a.e./ha)	120	200
Number of applications (-) / interval (d)	1 / -	1 / -
BBCH growth stage	10 – 19 30 – 32	Mar – Aug
Application window	BBCH 10 (Appdate) + 30 days[a]	1 Mar – 31 Mar 1 Apr – 1 May 1 May – 31 May 1 Jun – 1 Jul 1 Jul – 31 Jul 1 Aug – 31 Aug
PHI (d)	60 / 90[d]	7
Application period / region (relevant for STEP 1 and 2 only)	Northern Europe /Mar – May / Jun – Sep Southern Europe / Mar – May / Jun – Sep	
Interception class (relevant for STEP 2)	Minimal crop cover	
Application method	Ground spray	

CAM (Chemical application method)	2
Soil depth (cm)	4
Models used for calculation	STEPS 1-2 in FOCUS 3.2 FOCUS SPIN 2.2 FOCUS SWASH 5.3 (FOCUS PRZM 4.3.1, FOCUS MACRO 5.5.4, FOCUS TOXSWA 5.5.3)

Crop	Grass/alfalfa (<1 year)	Vegetables, bulb
Application rate (g a.e./ha)	120	120
Number of applications (-) / interval (d)	1 / -	1 / -
BBCH growth stage	Mar – Jul	11 – 16
Application window	1 Mar – 31 Mar 1 Apr – 1 May 1 May – 31 May 1 Jun – 1 Jul 1 Jul – 31 Jul	BBCH 11 (Appdate) + 30 days[a]
PHI (d)	7	42
Application period / region (relevant for STEP 1 and 2 only)	Northern Europe /Mar – May / Jun – Sep Southern Europe / Mar – May / Jun – Sep	
Interception class (relevant for STEP 2)	Minimal crop cover	
Application method	Ground spray	
CAM (Chemical application method)	1	2
Soil depth (cm)	4	

Models used for calculation	STEPS 1-2 in FOCUS 3.2 FOCUS SPIN 2.2 FOCUS SWASH 5.3 (FOCUS PRZM 4.3.1, FOCUS MACRO 5.5.4, FOCUS TOXSWA 5.5.3)

Crop	Cereals, winter	Cereals, spring
Application rate (g a.e./ha)	120	120
Number of applications (-) / interval (d)	1 / -	1 / -
BBCH growth stage	30 – 39	30 – 39
Application window	BBCH 30 (Appdate) + 30 days[a]	BBCH 30 (Appdate) + 30 days[a]
PHI (d)	-	-
Application period / region (relevant for STEP 1 and 2 only)	Northern Europe / Oct – Feb / Mar – May Southern Europe / Oct – Feb / Mar – May	Northern Europe /Mar – May Southern Europe / Mar – May
Interception class (relevant for STEP 2)	Average crop cover	
Application method	Ground spray	
CAM (Chemical application method)	2	
Soil depth (cm)	4	
Models used for calculation	STEPS 1-2 in FOCUS 3.2 FOCUS SPIN 2.2 FOCUS SWASH 5.3 (FOCUS PRZM 4.3.1, FOCUS MACRO 5.5.4, FOCUS TOXSWA 5.5.3)	

[a] as recommended in FOCUS [30 + (application number-1)*interval] days]
[b] also covers BBCH 15 + 31
[c] also covers linseed, BBCH 15 – 32
[d] 90 days for grain and 60 days for silage

For the crop “grass/alfalfa”, <1 year, an interception rate of 40 % was used in the modelling in accordance with the FOCUS guideline for applications to non-established grass (FOCUS, 2015). However, the MACRO model in SWASH uses the default maximum interception rate of 90 % for all grass/alfalfa uses. The following steps were taken to model the recommended interception rate for “grass/alfalfa”, <1 year.

1. The application rate (120 g a.e./ha) was adjusted to account for the interception rate of 40 %, resulting in an application rate of 72 g a.e./ha
2. In PRZM, the Chemical Application Method (CAM) was set to “1: application soil linear”
3. The parameter “ZFINT” which represents interception in the MACRO input files, was manually set to a value of 0, since interception had already been accounted for in step 1

4. The drift loadings for the water bodies (ditch, pond and stream) in the TOXSWA input files were recalculated with the actual application rate (120 g a.e./ha), using the SWASH drift calculator

Table 8.9-2: FOCUS Step 3 - Scenario related input parameters for $PEC_{sw/sed}$ calculations for the application of EF-243

Crop (use)	Scenario	Application window used in modelling	
		Single application	Multiple application
Sugar beets 1 × 120 g a.e./ha BBCH 12 - 39	D3	05 May (125) - 04 Jun (155)	-
	D4	13 May (133) - 12 Jun (163)	-
	R1	26 Apr (116) - 26 May (146)	-
	R3	31 Mar (90) - 30 Apr (120)	-
Sugar beets 2 × 60 g a.e./ha BBCH 12 - 39 (7 d interval)	D3	05 May (125) - 04 Jun (155)	05 May (125) - 11 Jun (162)
	D4	13 May (133) - 12 Jun (163)	13 May (133) - 19 Jun (170)
	R1	26 Apr (116) - 26 May (146)	26 Apr (116) - 02 Jun (153)
	R3	31 Mar (90) - 30 Apr (120)	31 Mar (90) - 07 May (127)
Oil seed rape, winter 1 × 120 g a.e./ha BBCH 30 - 50	D3	21-Feb (52) - 23-Mar (82)	-
	D4	01 Mar (60) - 31 Mar (90)	-
	D5	01 Mar (60) - 31 Mar (90)	-
	R1	15 Apr (105) - 15 May (135)	-
	R3	07 Mar (66) - 06 Apr (96)	-
Maize 1 × 100 g a.e./ha BBCH 10 - 19[a] BBCH 30 - 32[a]	D3	06 May (126) - 05 Jun (156)	-
	D4	11 May (131) - 10 Jun (161)	-
	D5	11 May (131) - 10 Jun (161)	-
	R1	04 May (124) - 03 Jun (154)	-
	R3	02 May (122) - 01 Jun (152)	-
	R4	11 Apr (101) - 11 May (131)	-
Grass/alfalfa (>1 year) 1 × 200 g a.e/ha	D3	01 Mar; 01 Apr; 01 May; 01 Jun; 01 Jul; 01 Aug	-
	D4		-
	D5		-
	R3		-
Grass/alfalfa (<1 year) 1 × 120 g a.e/ha	D3	01 Mar; 01 Apr; 01 May; 01 Jun; 01 Jul	-
	D4		-
	D5		-
	R3		-
Vegetables, bulb 1 × 120 g a.e./ha BBCH 11-19	D3	03-May (123) - 02-Jun (153)	-
	D4	02 May (122) - 01 Jun (152)	-
	R1	28 Apr (118) - 28 May (148)	-

~~Crop (use)~~	~~Scenario~~	~~Application window used in modelling~~	
		~~Single application~~	~~Multiple application~~
	~~R3~~	~~09-Mar (68) – 08-Apr (98)~~	~~-~~
	~~R4~~	~~09-Mar (68) – 08-Apr (98)~~	~~-~~
~~Cereals, winter 1 × 120 g a.e./ha BBCH 30 – 39~~	~~D3~~	~~25 Mar (84) – 24 Apr (114)~~	~~-~~
	~~D4~~	~~04 Apr (94) – 04 May (124)~~	~~-~~
	~~D5~~	~~16 Apr (106) – 16 May (136)~~	~~-~~
	~~R1~~	~~15-Mar (74) - 14-Apr (104)~~	~~-~~
	~~R3~~	~~16 Feb (47) – 18 Mar (77)~~	~~-~~
	~~R4~~	~~24 Apr (114) – 24 May (144)~~	~~-~~
~~Cereals, spring 1 × 120 g a.e./ha BBCH 30 – 39~~	~~D3~~	~~28 Apr (118) – 28 May (148)~~	~~-~~
	~~D4~~	~~18 May (138) – 17 Jun (168)~~	~~-~~
	~~D5~~	~~09 Apr (99) – 06 May (129)~~	~~-~~
	~~R4~~	~~09 Apr (99) – 06 May (129)~~	~~-~~

~~Values in brackets specify 'Julian Day'~~
~~[a] also covers linseed, BBCH 15 – 32. Start of application window set to BBCH 10. AppDate v3.06 recommended application dates for BBCH 10 and BBCH 32 are close. Therefore, additional simulation for BBCH 32 was not required~~

Table 8.9-3: Input parameters related to active substance clopyralid for $PEC_{sw/sed}$ calculations at Steps 1, 2 and 3

Compound	**Clopyralid**	**Value in accordance with EU endpoint / Reference**
Molar mass (g/mol)	191.96	Y / EFSA, 2018
Water solubility (mg/L)	1.43×10^5 (20 °C)	Y / EFSA, 2018
Saturated vapour pressure (Pa)	1.36×10^{-3} (25 °C)	Y / EFSA, 2018
Diffusion coefficient in water (m²/d)	4.3×10^{-5}	Default
Diffusion coefficient in air (m²/d)	0.43	Default
K_{foc} / K_{fom} (L/kg)	1.41 / 0.818 (geometric mean, n = 9)	Y / EFSA, 2018
Freundlich Exponent 1/n (-)	0.836 (arithmetic mean, n = 9)	Y / EFSA, 2018
Plant uptake factor (-)	0 (worst case assumption)	Y / EFSA, 2018
Wash-Off factor from Crop (1/mm)	0.05 (MACRO) 0.50 (PRZM)	Default
$DT_{50,soil}$ (d)	7.05 (geometric mean, field, normalised, n = 10)	Y / EFSA, 2018

Compound	**Clopyralid**	**Value in accordance with EU endpoint / Reference**
$DT_{50,water}$ (d)	1000 (FOCUS default)	Y / EFSA, 2018
$DT_{50,sed}$ (d)	1000 (FOCUS default)	Y / EFSA, 2018
$DT_{50,whole\ system}$ (d)	1000 (FOCUS default)	Y / EFSA, 2018

$PEC_{sw/sed}$

Step 1-2

Table 8.9-4: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for clopyralid following application to sugar beets, BBCH 12 – 39[a], 1 × 120 g a.e. /ha

Scenario FOCUS	**Period / Waterbody**	**Single Application**		
		Max PEC_{sw} (µg/L)	**21 d - $PEC_{sw,twa}$ (µg/L)**	**Max PEC_{sed} (µg/kg)**
Step 1				
-	-	41.0	40.7	0.578
Step 2				
Northern Europe	Mar-May	5.41	5.37	0.076
Northern Europe	Jun-Sep	5.41	5.37	0.076
Southern Europe	Mar-May	9.72	9.65	0.137
Southern Europe	Jun-Sep	7.57	7.51	0.107

[a] minimal crop cover used as worst case

Table 8.9-5: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for clopyralid following application to sugar beets, BBCH 12 – 15[a,b], 2 × 60 g a.e. /ha, 7 d interval

Scenario FOCUS	Period / Waterbody	Single Application			Multiple Application		
		Max PEC_{sw} (µg/L)	21 d - $PEC_{sw,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)	Max PEC_{sw} (µg/L)	21 d - $PEC_{sw,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
Step 1							
-	-	20.5	20.4	0.289	41.0	40.7	0.578
Step 2							
Northern Europe	Mar-May	2.71	2.69	0.038	4.21	4.18	0.059
Northern Europe	Jun-Sep	2.71	2.69	0.038	4.21	4.18	0.059
Southern Europe	Mar-May	4.86	4.82	0.069	7.45	7.39	0.105
Southern Europe	Jun-Sep	3.78	3.76	0.053	5.83	5.78	0.082

[a] minimal crop cover used as worst case
[b] also covers BBCH 15 + 31

Table 8.9-6: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for clopyralid following application to oil seed rape, winter, BBCH 30 – 50, 1 × 120 g a.e /ha

Scenario FOCUS	Period / Waterbody	Single Application		
		Max PEC_{sw} (µg/L)	21 d - $PEC_{sw,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
Step 1				
-	-	41.0	40.7	0.578
Step 2				
Northern Europe	Mar-May	2.72	2.70	0.038
Northern Europe	Jun-Sep	2.72	2.70	0.038
Northern Europe	Oct-Feb	5.14	5.10	0.072
Southern Europe	Mar-May	4.33	4.30	0.061
Southern Europe	Jun-Sep	3.52	3.50	0.050
Southern Europe	Oct-Feb	4.33	4.30	0.061

Table 8.9-7: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for clopyralid following application to maize, BBCH 10 – 32[a], 1 × 120 g a.e. /ha

Scenario FOCUS	Period / Waterbody	Single Application		
		Max PEC_{sw} (µg/L)	21 d - $PEC_{sw,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
Step 1				
-	-	41.0	40.7	0.578
Step 2				
Northern Europe	Mar-May	5.14	5.10	0.072
Northern Europe	Jun-Sep	5.14	5.10	0.072
Southern Europe	Mar-May	9.18	9.11	0.129
Southern Europe	Jun-Sep	7.16	7.11	0.101

[a] minimal crop cover used as worst case

Table 8.9-8: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for clopyralid following application to grass/alfalfa[a], 1 × 200 g a.e. /ha

Scenario FOCUS	Period / Waterbody	Single Application		
		Max PEC_{sw} (µg/L)	21 d - $PEC_{sw,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
Step 1				
-	-	68.4	67.9	0.964
Step 2				
Northern Europe	Mar-May	7.22	7.17	0.102
Northern Europe	Jun-Sep	7.22	7.17	0.102
Southern Europe	Mar-May	12.6	12.5	0.178
Southern Europe	Jun-Sep	9.91	9.84	0.140

[a] minimal crop cover used as worst case

Table 8.9-9: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for clopyralid following application to vegetables, bulb, BBCH 11 – 16, 1 × 120 g a.e. /ha

Scenario FOCUS	Period / Waterbody	Single Application		
		Max PEC_{sw} (µg/L)	21 d - $PEC_{sw,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
Step 1				
-	-	41.0	40.7	0.578
Step 2				
Northern Europe	Mar-May	5.95	5.91	0.084
Northern Europe	Jun-Sep	5.95	5.91	0.084
Southern Europe	Mar-May	10.8	10.7	0.152
Southern Europe	Jun-Sep	8.37	8.31	0.118

Table 8.9-10: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for clopyralid following application to cereals, winter, BBCH 30 – 39, 1 × 120 g a.e. /ha

Scenario FOCUS	Period / Waterbody	Single Application		
		Max PEC_{sw} (µg/L)	21 d - $PEC_{sw,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
Step 1				
-	-	41.0	40.7	0.578
Step 2				
Northern Europe	Mar-May	5.41	5.37	0.076
Northern Europe	Oct-Feb	11.9	11.8	0.167
Southern Europe	Mar-May	9.72	9.65	0.137
Southern Europe	Oct-Feb	9.72	9.65	0.137

Table 8.9-11: FOCUS Step 1 and 2 PEC_{sw} and PEC_{sed} for clopyralid following application to cereals, spring, BBCH 30 – 39, 1 × 120 g a.e. /ha

Scenario FOCUS	Period/ Waterbody	Single Application		
		Max PEC_{sw} (µg/L)	21 d - $PEC_{sw,twa}$ (µg/L)	Max PEC_{sed} (µg/kg)
Step 1				
-	-	41.0	40.7	0.578
Step 2				
Northern Europe	Mar-May	5.41	5.37	0.076
Southern Europe	Mar-May	9.72	9.65	0.137

~~**Step 3**~~

~~**Table 8.9-12: FOCUS Step 3 PEC_{sw} and PEC_{sed} of clopyralid following application to sugar beets**~~

~~Use~~	~~Scenario~~	~~Water body~~	~~Max. PEC_{sw} (µg/L)~~	~~Dominant entry route~~	~~21d – $PEC_{sw,twa}$ (µg/L)~~	~~Max. PEC_{sed} (µg/kg)~~
~~Sugar beets 1 × 120 g a.e./ha BBCH 12 – 39~~	~~D3~~	~~Ditch~~	~~0.643~~	~~drift~~	~~0.050~~	~~0.060~~
	~~D4~~	~~Pond~~	~~0.045~~	~~drift~~	~~0.043~~	~~0.033~~
	~~D4~~	~~Stream~~	~~0.525~~	~~drift~~	~~0.020~~	~~0.019~~
	~~R1~~	~~Pond~~	~~0.025~~	~~drift~~	~~0.024~~	~~0.014~~
	~~R1~~	~~Stream~~	~~0.435~~	~~drift~~	~~0.011~~	~~0.024~~
	~~R3~~	~~Stream~~	~~0.614~~	~~drift~~	~~0.036~~	~~0.051~~
~~Sugar beets 1 × 60 g a.e./ha BBCH 12 – 15[a]~~	~~D3~~	~~Ditch~~	~~0.321~~	~~drift~~	~~0.024~~	~~0.030~~
	~~D4~~	~~Pond~~	~~0.022~~	~~drift~~	~~0.021~~	~~0.017~~
	~~D4~~	~~Stream~~	~~0.262~~	~~drift~~	~~0.009~~	~~0.009~~
	~~R1~~	~~Pond~~	~~0.013~~	~~drift~~	~~0.012~~	~~0.007~~
	~~R1~~	~~Stream~~	~~0.218~~	~~drift~~	~~0.006~~	~~0.012~~
	~~R3~~	~~Stream~~	~~0.307~~	~~drift~~	~~0.018~~	~~0.026~~

Use	Scenario	Water body	Max. PEC_{sw} (µg/L)	Dominant entry route	21d – $PEC_{sw,twa}$ (µg/L)	Max. PEC_{sed} (µg/kg)
Sugar beets 2 × 60 g a.e./ha BBCH 12 – 15[a] 7d interval	D3	Ditch	0.284	drift	0.042	0.036
	D4	Pond	0.041	drift	0.040	0.033
	D4	Stream	0.239	drift	0.022	0.017
	R1	Pond	0.021	runoff	0.020	0.012
	R1	Stream	0.466	runoff	0.012	0.027
	R3	Stream	1.98	runoff	0.101	0.170

[a] also covers 2 × 60 g.a.e./ha, BBCH 15 + 31

Table 8.9-13: FOCUS Step 3 PEC_{sw} and PEC_{sed} of clopyralid following application to oil seed rape, winter

Use	Scenario	Water body	Max. PEC_{sw} (µg/L)	Dominant entry route	21d – $PEC_{sw,twa}$ (µg/L)	Max. PEC_{sed} (µg/kg)
Oil seed rape, winter 1 × 120 g a.e./ha BBCH 30 – 50	D3	Ditch	0.76	drift	0.032	0.049
	D4	Pond	0.028	drift	0.026	0.015
	D4	Stream	0.604	drift	0.004	0.012
	D5	Pond	0.026	drift	0.025	0.015
	D5	Stream	0.606	drift	0.001	0.008
	R1	Pond	0.037	runoff	0.034	0.021
	R1	Stream	1.76	runoff	0.047	0.103
	R3	Stream	1.13	runoff	0.039	0.071

Table 8.9-14: FOCUS Step 3 PEC_{sw} and PEC_{sed} of clopyralid following application to maize

Use	Scenario	Water body	Max. PEC_{sw} (µg/L)	Dominant entry route	21d – $PEC_{sw,twa}$ (µg/L)	Max. PEC_{sed} (µg/kg)
Maize 1 × 120 g a.e./ha BBCH 10 – 32[a]	D3	Ditch	0.640	Drift	0.046	0.056
	D4	Pond	0.029	Drift	0.028	0.017
	D4	Stream	0.541	Drift	0.004	0.014
	D5	Pond	0.027	Drift	0.025	0.016
	D5	Stream	0.538	Drift	0.002	0.009
	R1	Pond	0.033	Runoff	0.030	0.018
	R1	Stream	1.07	Runoff	0.022	0.049
	R3	Stream	3.93	Runoff	0.129	0.241
	R4	Stream	4.94	Runoff	0.194	0.377

[a] also covers linseed, BBCH 15 – 32. Start of application window set to BBCH 10. AppDate v3.06 recommended application dates for BBCH 10 and BBCH 32 are close. Therefore, additional simulation for BBCH 32 was not required

Table 8.9-15: FOCUS Step 3 PEC_{sw} and PEC_{sed} of clopyralid following application to grass/alfalfa (>1 year)

Use	Scenario	Water body	Max. PEC_{sw} (µg/L)	Dominant entry route	21d – $PEC_{sw,twa}$ µg/L)	Max. PEC_{sed} (µg/kg)
Grass/alfalfa (>1 year) 1 × 200 g a.e./h 1 Mar	D3	Ditch	1.27	drift	0.059	0.086
	D4	Pond	0.044	drift	0.041	0.023
	D4	Stream	1.02	drift	0.009	0.020
	D5	Pond	0.044	drift	0.042	0.025
	D5	Stream	1.04	drift	0.002	0.016
	R3	Stream	1.18	drift	0.017	0.048
	D3	Ditch	1.27	drift	0.079	0.099
	D4	Pond	0.044	drift	0.041	0.025

Use	Scenario	Water body	Max. PEC_{sw} (µg/L)	Dominant entry route	21d - $PEC_{sw,twa}$ µg/L)	Max. PEC_{sed} (µg/kg)
Grass/alfalfa (>1 year) 1 × 200 g a.e./ha 1 Apr	D4	Stream	0.976	drift	0.003	0.017
	D5	Pond	0.045	drift	0.043	0.027
	D5	Stream	1.05	drift	0.003	0.017
	R3	Stream	2.02	runoff	0.120	0.179
Grass/alfalfa (> 1 year) 1 × 200 g a.e./ha 1 May	D3	Ditch	1.28	drift	0.102	0.114
	D4	Pond	0.045	drift	0.042	0.026
	D4	Stream	1.09	drift	0.012	0.039
	D5	Pond	0.046	drift	0.044	0.028
	D5	Stream	1.18	drift	0.022	0.055
	R3	Stream	1.18	drift	0.021	0.053
Grass/alfalfa (>1 year) 1 × 200 g a.e./ha 1 Jun	D3	Ditch	1.31	drift	0.173	0.159
	D4	Pond	0.054	drift	0.051	0.032
	D4	Stream	1.09	drift	0.015	0.044
	D5	Pond	0.063	drift	0.061	0.042
	D5	Stream	1.18	drift	0.022	0.057
	R3	Stream	3.42	runoff	0.199	0.305
Grass/alfalfa (>1 year) 1 × 200 g a.e./ha 1 Jul	D3	Ditch	1.40	drift	0.279	0.240
	D4	Pond	0.064	drift	0.061	0.041
	D4	Stream	1.10	drift	0.025	0.049
	D5	Pond	0.050	drift	0.048	0.032
	D5	Stream	1.18	drift	0.022	0.055
	R3	Stream	1.18	drift	0.044	0.071
Grass/alfalfa (>1 year) 1 × 200 g a.e./ha 1 Aug	D3	Ditch	1.61	drift	0.569	0.442
	D4	Pond	0.133	drainage	0.132	0.114
	D4	Stream	1.10	drift	0.130	0.077

Use	Scenario	Water body	Max. PEC_{sw} (µg/L)	Dominant entry route	21d – $PEC_{sw,twa}$ µg/L)	Max. PEC_{sed} (µg/kg)
	D5	Pond	0.136	drainage	0.136	0.105
	D5	Stream	1.18	drift	0.071	0.061
	R3	Stream	1.18	drift	0.047	0.076

Table 8.9-16: FOCUS Step 3 PEC_{sw} and PEC_{sed} of clopyralid following application to grass/alfalfa (<1 year)

Use	Scenario	Water body	Max. PEC_{sw} (µg/L)	Dominant entry route	21d – $PEC_{sw,twa}$ (µg/L)	Max. PEC_{sed} (µg/kg)
Grass/alfalfa (<1 year) 1 × 120 g a.e./ha 1 Mar	D3	Ditch	0.761	Drift	0.036	0.052
	D4	Pond	0.027	Drift	0.025	0.014
	D4	Stream	0.614	Drift	0.005	0.012
	D5	Pond	0.027	Drift	0.025	0.016
	D5	Stream	0.623	Drift	0.001	0.010
	R3	Stream	0.705	Drift	0.010	0.029
Grass/alfalfa (<1 year) 1 × 120 g a.e./ha 1 Apr	D3	Ditch	0.763	Drift	0.047	0.060
	D4	Pond	0.027	Drift	0.025	0.015
	D4	Stream	0.586	Drift	0.002	0.011
	D5	Pond	0.027	Drift	0.025	0.017
	D5	Stream	0.628	Drift	0.002	0.011
	R3	Stream	0.709	Drift	0.025	0.032
Grass/alfalfa (<1 year) 1 × 120 g a.e./ha 1 May	D3	Ditch	0.766	Drift	0.060	0.068
	D4	Pond	0.028	Drift	0.026	0.016
	D4	Stream	0.652	Drift	0.007	0.024
	D5	Pond	0.027	Drift	0.026	0.017

Use	Scenario	Water body	Max. PEC_{sw} (µg/L)	Dominant entry route	21d $PEC_{sw,twa}$ (µg/L)	Max. PEC_{sed} (µg/kg)
	D5	Stream	0.710	Drift	0.013	0.033
	R3	Stream	0.709	Drift	0.013	0.032
Grass/alfalfa (<1 year) 1 × 120 g a.e./ha 1 Jun	D3	Ditch	0.780	Drift	0.097	0.091
	D4	Pond	0.031	Drift	0.030	0.019
	D4	Stream	0.655	Drift	0.009	0.027
	D5	Pond	0.032	Drift	0.030	0.021
	D5	Stream	0.710	Drift	0.013	0.034
	R3	Stream	1.17	Runoff	0.073	0.108
Grass/alfalfa (<1 year) 1 × 120 g a.e./ha 1 Jul	D3	Ditch	0.815	Drift	0.141	0.124
	D4	Pond	0.035	Drift	0.034	0.023
	D4	Stream	0.658	Drift	0.011	0.029
	D5	Pond	0.029	Drift	0.028	0.019
	D5	Stream	0.710	Drift	0.013	0.033
	R3	Stream	0.710	Drift	0.016	0.033

Table 8.9-17: FOCUS Step 3 PEC_{sw} and PEC_{sed} of clopyralid following application to vegetables, bulb

Use	Scenario	Water body	Max. PEC_{sw} (µg/L)	Dominant entry route	21d - $PEC_{sw,twa}$ (µg/L)	Max. PEC_{sed} (µg/kg)
Vegetables, bulb 1 × 120 g a.e./ha BBCH 11 – 16	D3	Ditch	0.776	drift	0.057	0.069
	D4	Pond	0.106	drainage	0.104	0.072
	D4	Stream	0.591	drift	0.064	0.038
	R1	Pond	0.03	runoff	0.028	0.016
	R1	Stream	1.22	runoff	0.03	0.072
	R3	Stream	0.704	drift	0.015	0.028
	R4	Stream	5.61	runoff	0.199	0.427

Table 8.9-18: FOCUS Step 3 PEC_{sw} and PEC_{sed} of clopyralid following application to Cereals, winter

Use	Scenario	Water body	Max. PEC_{sw} (µg/L)	Dominant entry route	21d - $PEC_{sw,twa}$ (µg/L)	Max. PEC_{sed} (µg/kg)
Cereals, winter 1 × 120 g a.e./ha BBCH 30 – 39	D3	Ditch	0.765	drift	0.042	0.057
	D4	Pond	0.028	drift	0.026	0.015
	D4	Stream	0.564	drift	0.003	0.009
	D5	Pond	0.026	drift	0.025	0.016
	D5	Stream	0.607	drift	0.001	0.009
	R1	Pond	0.029	runoff	0.027	0.016
	R1	Stream	1.60	runoff	0.038	0.091
	R3	Stream	0.704	drift	0.009	0.028
	R4	Stream	0.503	drift	0.005	0.018

~~**Table 8.9-19: FOCUS Step 3 PEC_{sw} and PEC_{sed} of clopyralid following application to Cereals, spring**~~

~~Use~~	~~Scenario~~	~~Water body~~	~~Max. PEC_{sw} (µg/L)~~	~~Dominant entry route~~	~~21d $PEC_{sw,twa}$ (µg/L)~~	~~Max. PEC_{sed} (µg/kg)~~
~~Spring cereals 1 × 120 g a.e./ha BBCH 30 – 39~~	~~D3~~	~~Ditch~~	~~0.767~~	~~drift~~	~~0.049~~	~~0.062~~
	~~D4~~	~~Pond~~	~~0.037~~	~~drift~~	~~0.035~~	~~0.023~~
	~~D4~~	~~Stream~~	~~0.627~~	~~drift~~	~~0.008~~	~~0.019~~
	~~D5~~	~~Pond~~	~~0.026~~	~~drift~~	~~0.025~~	~~0.016~~
	~~D5~~	~~Stream~~	~~0.639~~	~~drift~~	~~0.002~~	~~0.011~~
	~~R4~~	~~Stream~~	~~3.49~~	~~runoff~~	~~0.154~~	~~0.241~~

8.9.2.1 $PEC_{sw/sed}$ of EF-243

For foliar-applied crop protection products, spray drift is the most important route of contamination of surface waters. As formulations consist of a mixture of components, the spray drift PEC cannot be estimated by the FOCUS models, therefore it is considered using the FOCUS SWASH Drift calculator. The water body stream was corrected for additional input with a factor of 1.2.

Table 8.9-20: PEC_{sw} of GF 243 following the single application to various crops

Formulation	**No. of applications**	**Maximum use rate (g EF-243 /ha)[a]**	**Crop**	**PEC_{SW}[b] (µg EF-243 /L)**				
				Spray drift buffer (m)	**Drift-reducing nozzles (%)**			
					0	**50**	**75**	**90**
EF-243	1	~~760.5~~ 760,9	Grass/alfalfa	FOCUS default	~~4.04~~ 4.89	~~2.02~~ 2.93	~~1.01~~ 1.47	~~0.404~~ 0.59
				5	1.59	0.795	0.397	0.159
				10	0.843	0.421	0.211	0.084
				15	0.576	0.288	0.144	0.058
				20	0.438	0.219	0.110	0.044

[a] the formulation components are considered to dissipate rapidly after application, therefore only one application is taken into consideration. The PEC for the formulation was based on a specific density of 1.1408 g/mL with an application of 0.667 L EF-

243/ha representing the maximum application rate in the GAP.
[b] PEC_{sw} values represent the maximum over ditch, pond and stream

Evaluation by zRMS	PECsw (KCP 9.2.5)
Inputs for Modelling	The PEC_{SW} and PEC_{sed} were calculated in compliance with relevant FOCUS scenarios in stepwise procedure (Steps 1, 2 and 3). Only the PEC values obtained at Steps 1 and 2 have been evaluated as these values are sufficient for ecotoxicological risk assessment (see dossier section 9). The PECsw and PECsed calculations for the active substance clopyralid at Step 1 and 2 are accepted. All input parameters for clopyralid are considered acceptable as they followed the LoEP (2018). **LONTREL 300 SL (EF-243)** Calculations of PEC_{SW} values for formulation has been provided by Applicant. The PECsw were recalculated by zRMS for FOCUS default. The other PECsw values for the formulation are correct. The results are presented in Table 8.9-20 Presented calculations may be used for risk assessment.
Agreed endpoints	Please refer to Tables 8.9-4 and 8.9-11.
Implication for risk assessment	Please refer to Part B, Section 9 of this dRR.

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

Studies on the fate and behaviour in air with the formulation were not performed, since it is possible to extrapolate from data obtained with the active substance.

The fate and behaviour in air of clopyralid was evaluated during Annex I renewal (EFSA, 2018[1]). No additional studies have been performed.

Table 8.10-1 Summary of atmospheric degradation and behaviour of clopyralid

Compound	Clopyralid
Direct photolysis in air	Not studied - no data requested
Quantum yield of direct phototransformation	-
Photochemical oxidative degradation in air	DT_{50} (d): 19.5 derived by the Atkinson model using AOPWIN (v1.90)
Volatilisation	Vapour pressure (Pa): 1.36×10^{-3} at 25 °C Henry's Law Constant (Pa m^3/mol): 3.28×10^{-10} From plant surfaces: ≤4 % after 24 hours From soil: <2 % after 24 hours

The vapour pressure at 20 °C of the active substance clopyralid is estimated to be > 10^{-4} Pa (7.07×10^{-4};

calculated with EVA 3). Hence the active substance clopyralid is regarded as semi-volatile (volatilisation from soil and plant surfaces). Therefore exposure of adjacent surface waters and terrestrial ecosystems by the clopyralid due to volatilisation with subsequent deposition should be considered. The low Henry's Law Constant indicates that partitioning into air is negligible. Therefore the risk of long range transport of clopyralid is acceptable.

Evaluation by zRMS	**Fate and behaviour in air (KCP 9.3)**
Comments	The data on the atmospheric degradation and behaviour for the active substance follows the EU assessment and is therefore agreed by the zRMS.
Conclusion for exposure assessment	The vapour pressure at 20 °C of the active substance clopyralid is > 10^{-4} Pa (1.36 × 10^{-3} at 25 °C). Due to the low potential of volatilisation as derived from physico-chemical properties, the environmental concentrations in air and the transport through air are considered negligible.

Appendix 1 Lists of data considered in support of the evaluation

List of data submitted by the applicant and relied on

Data point	**Author(s)**	**Year**	**Title** **Company Report No.** **Source (where different from company)** **GLP or GEP status** **Published or not**	**Verte-brate study** **Y/N**	**Owner**
KCP 9.1.3 KCP 9.2.4 KCP 9.2.5	Anagu, I. & González Camarero, P	2021	Predicted environmental concentrations of clopyralid in soil, groundwater, surface water and sediment following application to various crops – a modelling assessment for Europe Dr Knoell consult Report No. 109738-1 non GLP Unpublished	N	CAS

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**	**Verte-brate study** **Y/N**	**Owner**
KCP XX	Author	YYYY	Title Company Report N Source GLP/non GLP/GEP/non GEP Published/Unpublished	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**	**Verte-brate study Y/N**	**Owner**
KCP XX	Author	YYYY	Title Company Report N Source GLP/non GLP/GEP/non GEP Published/Unpublished	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**	**Verte-brate study Y/N**	**Owner**
KCP XX	Author	YYYY	Title Company Report N Source GLP/non GLP/GEP/non GEP Published/Unpublished	Y/N	Owner

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Verte-brate study Y/N	Owner

Appendix 2 Detailed evaluation of the new Annex II studies

No studies provided

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

A 3.1 Predicted Environmental Concentrations in soil (PEC_{soil}) (KCP 9.1.3)

Initial PEC_{soil} values

The initial PEC_{soil} of the active substance is calculated according to Equation 1:

Equation 1
$$PEC_{soil,ini,1} = \frac{(A_1 - (A_1 \times p_1)) \times 10}{d \times bd}$$

where
$PEC_{soil,ini,1}$ = initial concentration in soil after single application (mg/kg)
A = application rate of the active substance (g/ha)
p_1 = fraction intercepted by the crop canopy (-)
d = mixing depth, i.e. 5 (cm)
bd = soil bulk density, i.e. 1.5 (g/cm³)

The initial PEC_{soil} of the active substance after n applications is calculated according to Equation 2 considering degradation between the applications:

Equation 2
$$PEC_{soil,ini,n} = PEC_{soil,ini,n-1} \times e^{-k \times (t_n - t_{n-1})} + \frac{(A_n - (A_n \times p_n)) \times 10}{d \times bd}$$

The maximum PEC_{soil} of the metabolite is calculated with the same equation but considering a pseudo-application rate, taking into account the molar mass difference between parent and metabolite and the maximum occurrence of the metabolite in soil.

The actual and time-weighted average concentrations of the compounds are calculated according to Equation 3 and Equation 4, respectively:

Equation 3
$$PEC_{soil,act,t} = PEC_{soil,ini,n} \times e^{-k \times t}$$

where
$PEC_{soil,act,t}$ = actual PECsoil at time t after initial/maximum PEC_{soil} (mg/kg)
$PEC_{soil,ini,n}$ = initial/maximum PEC_{soil} after n applications (mg/kg)
k = first order degradation/dissipation rate constant in soil ($ln(2)/DT_{50}$) (1/d)
t = time after initial/maximum PEC_{soil} (d)

Equation 4
$$PEC_{soil,twa,t} = \frac{PEC_{soil,ini,n} \times (1 - e^{-k \times t})}{k \times t}$$

where
$PEC_{soil,twa,t}$ = time-weighted average PEC_{soil} over t days (mg/kg)
$PEC_{soil,ini,n}$ = initial/maximum PEC_{soil} after n applications (mg/kg)
k = first order degradation/dissipation rate constant in soil (ln(2)/DT50) (1/d)

t = time after initial/maximum PEC_{soil} (d)

Plateau Concentration

In addition to the seasonal PEC_{soil} calculations, the potential accumulation in soil following repeated annual applications of the formulation was calculated. The accumulation potential can be described with the $PEC_{accumulation}$, which is the sum of the $PECs_{oil,ini,n}$ and the plateau concentration directly before the application in the next season ($PEC_{soil\ plateau}$). The calculation of PEC_{soil} plateau and $PEC_{accumulation}$ is described in Equation 5 and Equation 6.

Equation 5 $$PEC_{soilplateau} = \frac{PEC_{soil,ini,d}}{(1-e^{-k\times 365})} \times e^{-k\times(365-(n_a-1)\times i_a)}$$

where
$PEC_{soil\ plateau}$ = plateau concentration directly before the application in the next season (mg/kg)
$PEC_{soil,ini,d}$ = $PEC_{soil,ini}$ on last application day with soil parameters for accumulation (i.e. 20 cm/5 cm soil depth; ploughing considered/not considered between seasons) (mg/kg)
k = degradation rate (1/d)
na = number of applications (-)
ia = interval between applications (d)

Equation 6 $$PEC_{accumulation} = PEC_{soilplateau} + PEC_{soil,ini,n}$$

where
$PEC_{accumulation}$ = accumulation PEC_{soil} (mg/kg)
$PEC^{soil,ini,n}$ = initial PEC_{soil} in one season considering a soil depth of 5 cm (mg/kg)
$PEC_{soil\ plateau}$ = plateau PEC_{soil} (concentration directly before the first application in the next season) considering a soil depth of 20 cm/5 cm (ploughing considered/not considered between seasons) (mg/kg)

Appendix 4 Justification for Plant Uptake Factor (PUF) refinement

Translocation in plants was demonstrated in a dedicated PUF study (Gourlay, 2015[3]), and underpinned by comparing the PUF study to the 30 days plant-back interval confined rotational study by Hall (2015[4])

The dedicated PUF study by Gourlay (2015) is fully in agreement with the study test design that has been developed by German UBA and the German industry association IVA since October 2018. The study design has been shared for commenting with other Member States by UBA.

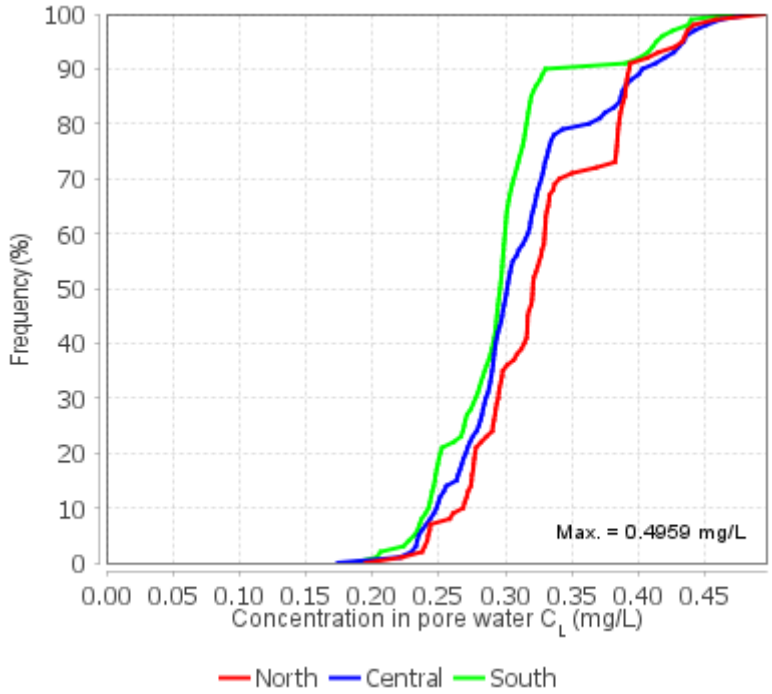
The applicant proposes that Tier 2 calculations with a PUF = 0.5 should be considered as a refinement. The dedicated PUF study Gourlay (2015) is compared to the 30 days plant-back interval confined rotational crop study by Hall (2015) which was run with soil. The applicant also wants to draw the attention to previous EFSA conclusion on Succeeding and Rotational Crops (**EFSA Scientific Report, 2005 (50), Conclusion on the peer review of clopyralid**):

"Furthermore, metabolism studies indicated that clopyralid is systemically taken into plants and readily translocated in plants. Soil –plant transition factors to estimate the residue situation in rotational crops have been calculated by RMS and presented in the evaluation meeting. The values indicate that there might be good uptake from soil or even accumulation in the plants, and soil residues above 0.001 mg/kg might be present at the time of harvesting rotational crops."

The primary intention for conducting the study Gourlay (2015) was not to derive a measured PUF value for use in modelling but to demonstrate under controlled conditions that clopyralid will be taken up by roots and transported to the shoots. The observed PUF values were higher than the default PUF = 0.5 for root systemic substances. The experimentally derived PUF value should represent the potential of a crop to take up a substance. Actual uptake is downregulated in the simulation models. In the groundwater simulation models plant uptake is regulated by a) availability of substance in the pore water, and b) transpiration. This is similar to $DegT_{50}$, which enters the models determined at (or normalized to) 20°C. Actual degradation rates are adjusted for actual temperature conditions (ignoring soil moisture for the sake of simplicity).

With regards to a potential overestimation of substance availability in hydroponic systems the applicant would like to add that clopyralid test solution concentration had been selected to mirror what could be expected in soil pore water in the field. The magnitude of concentration had been estimated with EFSA model PERSAM whose mathematical equations are described in the EFSA Scientific Opinion on the assessment of exposure of organisms to substances in soil (**EFSA Journal 2012;10(2):2562**). Considering the common wheat scenario, a $DegT_{50}$ = 7.05 days (geometric mean field), K_{OC} = 1.41 L/kg (geometric mean), and an application of 80 g clopyralid/ha (20% crop interception) the Tier 2 CDF of soil pore water concentrations across Europe can be predicted.

Below, the $PEC_{pore,\ water}$ shown is the 7-day TWA which is considered as more relevant to a study with an exposure duration of similar length. Furthermore, a 20 cm soil depth is considered because the root system will be found predominantly in this layer.



Predicted 7-day pore water concentrations of clopyralid over 20 cm following an application of 80 g clopyralid/ha at BBCH 20-29 to cereals yields a range from 150 to 500 µg/L. The average clopyralid test solution concentration was 70 µg/L in Gourlay (2015). The reason for selecting a lower concentration than predicted was that pre-tests on plant tolerance had shown that higher concentrations would impair plant health in the test system.

Additionally, the applicant would like to point to study Hall (2015), a 30-day plant-back interval confined rotational study. One of the primary objectives was to provide an estimate of the total radioactive residues in three rotational crops (wheat, cabbage and radish) following an application of 300 g clopyralid/ha to bare soil 30 days prior to planting. Crops were grown in test plots containing a Missouri sandy loam. Wheat samples were harvested 62 days after treatment (DAT) at BBCH 43, as well as later. The first sampling is closest to the growth stage considered in Gourlay (2015), e.g. BBCH 21-31 at application of test item.

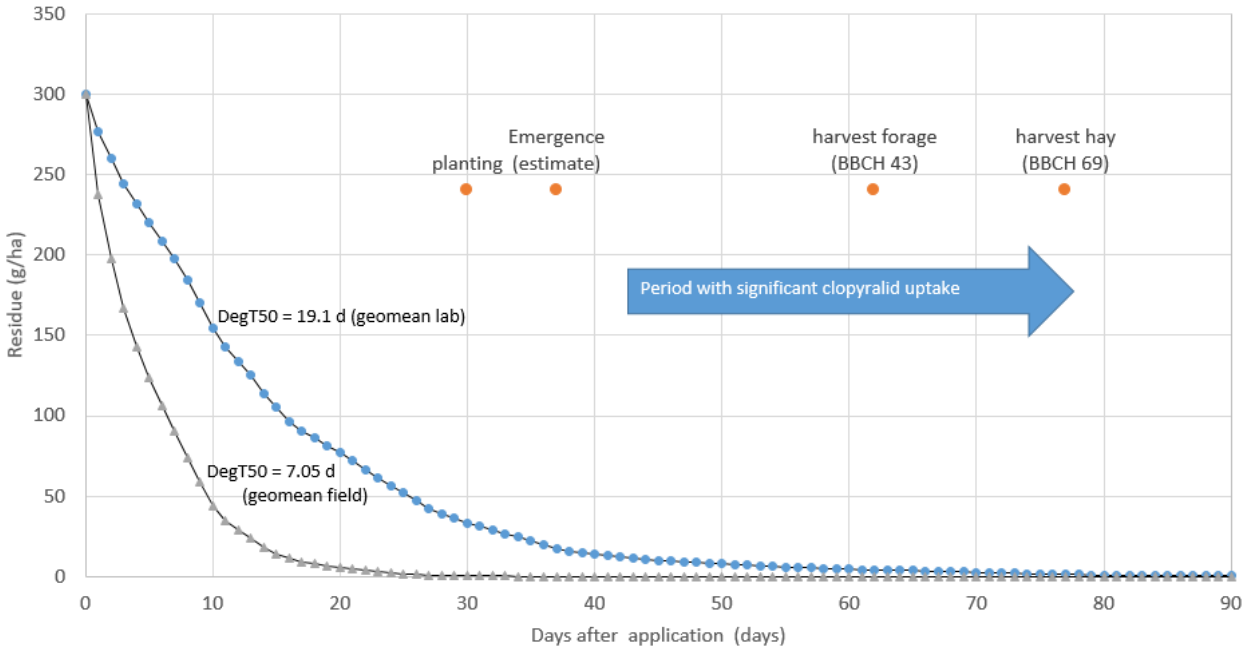
At 62 DAT clopyralid residue in wheat shoots amounted to 0.367 mg/kg. At 78 DAT to 0.729 mg/kg. These values are about one magnitude of order lower than observed by Gourlay (2015):

Replicate	**Clopyralid in stem & leaves observed by Gourlay (2015) (mg/kg)**
a	8.19
b	7.84
c	6.75
d	6.96
Average	7.43

Dry matter content of clopyralid had not been reported in the study report but is recorded in the raw data.

The lower contents found by Hall (2015) may be explained by a lower exposure to clopyralid in soil. While soil concentrations had not been measured directly, an estimate can be provided. Below clopyralid residue decline is modelled with the geometric mean laboratory $DegT_{50}$ (19.1 d) and the geometric mean field $DegT_{50}$ (7.05 d). Considering both $DegT_{50}$ values should show the range of soil residue that could be expected. The decline has been adjusted for observed daily soil temperature, which was always well above

20°C. Furthermore, the plots had been irrigated often. Soil moisture should not have affected degradation greatly.



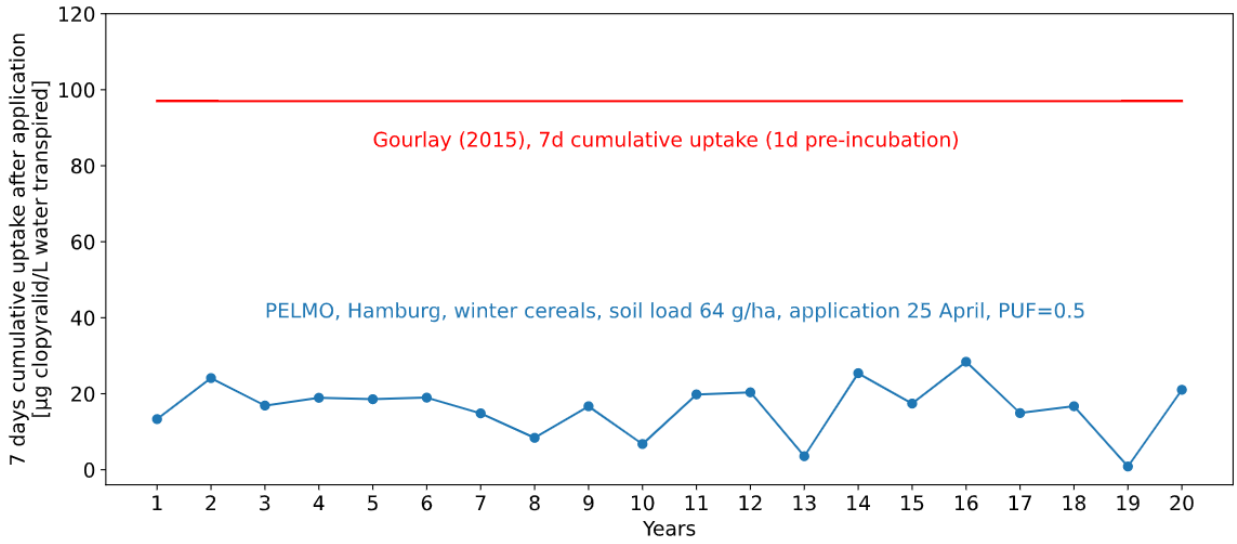
No date is given for emergence of wheat in the trial. However, given the fairly high temperatures one week after planting can be assumed. With regards to clopyralid uptake it can be assumed that seedlings will not take up significant amounts since their canopy is still too small for higher transpiration rates.
Taking this crop development into account it can be excluded that plants took up significant amounts of clopyralid before 44 DAT. Looking at the modelled residue decline curves 44 DAT corresponds to 0 to 10 g/ha clopyralid residue, depending on the $DegT_{50}$. This is a very low level and may explain why wheat dry matter residue contents of clopyralid were lower than in Gourlay (2015). Especially when considering that real uptake would not have taken place before BBCH 20, which would correspond to even lower soil residue contents.

Finally, the uptake observed by Gourlay (2015) is put into context with FOCUS PELMO modelling. A comparison is made between the uptake observed and the uptake modelled by FOCUS PELMO for a soil load of 64 g/ha in the Hamburg winter cereals scenario with an application date of 25 April and a refined PUF of 0.5.

FOCUS models do not simulate crop biomass. Therefore, a comparison is made by normalizing substance uptake by water transpired, e.g. for the 7-day period after application the uptake of clopyralid is divided by water transpired in the same period.

FOCUS PELMO output file PLOT.PLM reports variables TETD (water transpired; cm/d) and TUPF (substance taken up by crop; kg/ha.d). For each application year these two variables had been extracted for the 7-day period after application.

Below substance taken up in the 7 days after application is shown for each application year. For comparison the red line shows the uptake in winter wheat observed by Gourlay (2015).



Gourlay (2015) observed a normalized uptake of 97 µg/L[6] which is well above the amounts simulated by FOCUS PELMO (range 1 to 28 µg/L). As alluded to above the hydroponic laboratory study can be considered as a best case similar to $DegT_{50}$ soil degradation studies. Actual uptake is scaled down by environmental conditions in the modelling scenarios. Therefore, even with a consideration of a PUF = 0.5 the risk assessment is still conservative.

[6] Calculated from data presented in Table A 11 in Gourlay (2015): cumulative uptake with 1 d pre-incubation (mass uptake 26.33 µg, water uptake 271.8 mL)