Draft Renewal Assessment Report
under Regulation (EC) 1107/2009

CLOPYRALID

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Co-RMS: Poland

May 2017

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Version History

When	What
2017/May	DRAR- First version submitted to EFSA

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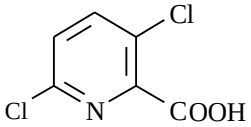
Section 1 Identity, Physical and Chemical Properties, Details of Uses, Further Information, Methods of Analysis

Identity, Physical and Chemical Properties, Details of Uses, Further Information (Regulation (EU) N° 283/2013, Annex Part A, points 1.3 and 3.2)

Active substance (ISO Common Name)	Clopyralid
Function (*e.g.* fungicide)	Herbicide

Rapporteur Member State	Finland
Co-rapporteur Member State	Poland

Identity (Regulation (EU) N° 283/2013, Annex Part A, point 1)

Chemical name (IUPAC)	3,6-dichloropyridine-2-carboxylic acid
Chemical name (CA)	3,6-dichloro-2-pyridinecarboxylic acid
CIPAC No	455
CAS No	1702-17-6
EC No (EINECS or ELINCS)	216-935-4
FAO Specification (including year of publication)	Not Applicable
Minimum purity of the active substance as manufactured	950 g/kg
Identity of relevant impurities (of toxicological, ecotoxicological and/or environmental concern) in the active substance as manufactured	Not applicable
Molecular formula	$C_6H_3Cl_2NO_2$
Molar mass	191.96 g/mol
Structural formula	

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Physical and chemical properties (Regulation (EU) N° 283/2013, Annex Part A, point 2)

Melting point (state purity)	149.6 ± 0.2 °C (99.8%)
Boiling point (state purity)	Decomposes at 164 ± 2 °C (99.8%) A thermal effect due to boiling was not observed.
Temperature of decomposition (state purity)	Decomposes at 164 ± 2 °C (99.8%)
Appearance (state purity)	(95.3%): Color - Cream Physical State - Powdery Solid (99.8%): Color - white Physical State - Crystalline Solid
Vapour pressure (state temperature, state purity)	1.36×10^{-6} kPa at 25°C (99.6%)
Henry's law constant	pH / Henry's Law Constant (Pa m^3/mol) at 20°C Unbuffered: 3.28×10^{-10} 5: 2.18×10^{-11} 7: 1.80×10^{-11} 9: 1.64×10^{-11}
Solubility in water (state temperature, state purity and pH)	(20°C, 99.2%): Unbuffered water (pH 1.7): 0.785 g/100 mL pH 5.0: 11.8 g/100 mL pH 7.0: 14.3 g/100 mL pH 9.0: 15.7 g/100 mL
Solubility in organic solvents (state temperature, state purity)	(95.9%): Xylene: 4.61 g/L 1,2-dichloroethane: 20.7 g/L Acetone: >250 g/L Ethyl acetate: 102 g/L (96.4%): n-hexane: 0.6% (wt/wt) Methanol: 10.4% (wt/wt)
Surface tension (state concentration and temperature, state purity)	71.5 mN/m at 20°C (1 g/L aqueous solution) (99.9%)

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Partition coefficient
(state temperature, pH and purity)

(20°C, 99.2%):
pH 5 buffer: log P_{OW} = -1.81
pH 7 buffer: log P_{OW} = -2.63
pH 9 buffer: log P_{OW} = -2.55

Dissociation constant (state purity)

pKa = 2.01 +/- 0.11 at 25°C (99.6%)

UV/VIS absorption (max.) incl. ε
(state purity, pH)

(99.9%):

pH	Concentration (µg/mL)	ε (L mol^{-1} cm^{-1})	λ (nm)
<2	19.4	19468	201
		8771	226
		3609	282
		2777	**290**
<2	58.3	11247	206
		8263	223
		3614	282
		2820	**290**
7	19.4	16355	198
		8951	221
		4640	280
		2832	**290**
7	58.3	9581	202
		8533	220
		4592	280
		2875	**290**
>10	19.4	15262	199
		9395	221
		4904	280
		3072	**290**
>10	58.3	9695	203
		8884	219
		4788	280
		3019	**290**

Flammability (state purity)

Not flammable (95.9%)

Explosive properties (state purity)

No sign of ignition or explosion (95.4%)

Oxidising properties (state purity)

Non-oxidising (95.9%)

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Rapporteur Member State	Month and year	Active Substance
Finland	**May 2017**	**Clopyralid**

Section 1 Identity, Physical and Chemical Properties, Details of Uses, Further Information, Methods of Analysis

Details of Uses:

Summary of representative uses evaluated, for which all risk assessments needed to be completed (*name of active substance or the respective variant*)
(Regulation (EU) N° 284/2013, Annex Part A, points 3, 4)

Crop and/or situation (a)	Member State or Country	Product name	F G or I (b)	Pests or Group of pests controlled (c)	Preparation		Application				Application rate per treatment			PHI (days) (m)	Remarks
					Type (d-f)	Conc. a.s. (i)	method kind (f-h)	range of growth stages & season (j)	number min-max (k)	Interval between application (min)	kg a.s /hL min-max (l)	Water L/ha min-max	kg a.s./ha min-max (l)		
Winter cereal (wheat, barley oat, rye, triticale, spelt)	CZ/SZ	GF-1374	F	Broad-leaf weeds	EC	80 g/L Clopyralid + 2.5 g/L florasulam + 144 g/L fluroxypyr-metyl (equivalent to 100 g ae/ha fluroxypyr)	Over all broad cast 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)	80-400	Clopyralid 0.08 kg as/ha + Florasulam 0.0025 kg as/ha + Fluroxypyr-meptyl 0.144 kg as/ha (0.100 kg ae/ha)	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).
Established permanent pasture	CZ/SZ	GF-1374	F	Broadleaf weeds	EC	80 g/L Clopyralid + 2.5 g/L florasulam + 144 g/L fluroxypyr-metyl	Over all broad cast 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	100-400	Clopyralid 0.12 kg as/ha + Florasulam 0.00375 kg as/ha + Fluroxypy	7 to 14 days (see note 1)	Dose: 1.5L GF-1374/ha. Note 1: PHI: 7 days for CZ and 14 days for SZ is the interval before any crop cutting or

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Crop and/or situation (a)	Member State or Country	Product name	F G or I (b)	Pests or Group of pests controlled (c)	Preparation		Application				Application rate per treatment			PHI (days) (m)	Remarks
					Type (d-f)	Conc. a.s. (i)	method kind (f-h)	range of growth stages & season (j)	number min-max (k)	Interval between application (min)	kg a.s /hL min-max (l)	Water L/ha min-max	kg a.s./ha min-max (l)		
						(equivalent to 100 g ae/ha fluroxypyr)					kg as/hL + Fluroxypyr meptyl: 0.054 to 0.27 kg as/hL (0.0375 to 0.1875 kg ae/hL)		r-meptyl 0.216 kg as/ha (0.15kg ae/ha)		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.

(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
(m) PHI - minimum pre-harvest interval

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Section 1 Identity, Physical and Chemical Properties, Details of Uses, Further Information, Methods of Analysis

Summary of additional intended uses for which MRL applications have been made, that in addition to the uses above, have also been considered in the consumer risk assessment (*name of active substance or the respective variant*)
Regulation (EC) N° 1107/2009 Article 8.1(g))

Important note: efficacy, environmental risk and risk to humans by exposure other than via their diet have not been assessed for these uses

Crop and/or situation (a)	Member State or Country	Product name	F G or I (b)	Pests or Group of pests controlled (c)	Preparation		Application				Application rate per treatment			PHI (days) (m)	Remarks
					Type (d-f)	Conc. a.s. (i)	method kind (f-h)	range of growth stages & season (j)	Number min-max (k)	Interval between application (min)	kg a.s /hL min-max (l)	Water L/ha min-max	kg a.s./ha min-max (l)		
MRL Application (according to Article 8.1(g) of Regulation (EC) No 1107/2009)															

(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).**
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(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
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Section 1 Identity, Physical/ Chemical Properties, Details of Uses, Further Information, Methods of Analysis

Further information, Efficacy

Effectiveness (Regulation (EU) N° 284/2013, Annex Part A, point 6.2)

All types of winter cereals and Established permanent pasture can be treated in the spring to control important dicotyledonous species including the range listed in the table below. The GAP of the representative formulation is fully supported.

Adverse effects on field crops (Regulation (EU) N° 284/2013, Annex Part A, point 6.4)

When used according to the dose rates and application timings detailed in the directions for use and the GAP no adverse effects on treated crops are expected.

Observations on other undesirable or unintended side-effects (Regulation (EU) N° 284/2013, Annex Part A, point 6.5)

When used according to the dose rates and application timings detailed in the directions for use and the GAP no undesirable or unintended side effects are expected adverse effects on treated crops are expected.

Groundwater metabolites: Screening for biological activity (SANCO/221/2000-rev.10-final Step 3 a Stage 1)

Potential leaching of metabolites into groundwater due to the representative GAP have been evaluated. The trigger value of 0.1 µg/L is not exceeded. Therefore no assessment of biological activity is required.

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Methods of Analysis

Analytical methods for the active substance (Regulation (EU) N° 283/2013, Annex Part A, point 4.1 and Regulation (EU) N° 284/2013, Annex Part A, point 5.2)

Technical a.s. (analytical technique)	Gas Chromatography (GC/FID)
Impurities in technical a.s. (analytical technique)	Gas Chromatography (GC/FID)
Plant protection product (analytical technique)	Liquid Chromatography (LC)

Analytical methods for residues (Regulation (EU) N° 283/2013, Annex Part A, point 4.2 & point 7.4.2)

Residue definitions for monitoring purposes

Food of plant origin		Clopyralid, its salts and conjugates, expressed as clopyralid
Food of animal origin		Clopyralid, its salts and conjugates, expressed as clopyralid
Soil		Clopyralid
Sediment		Clopyralid
Water	surface	Clopyralid
	drinking/ground	Clopyralid
Air		Clopyralid
Body fluids and tissues		Clopyralid

Monitoring/Enforcement methods

Food/feed of plant origin (analytical technique and LOQ for methods for monitoring purposes)	LC-MS/MS, LOQ = 0.01 mg/kg (dry, wet, acidic and oily crops)
Food/feed of animal origin (analytical technique and LOQ for methods for monitoring purposes)	LC-MS/MS, LOQ = 0.01 mg/kg (muscle, fat, kidney, milk, liver, and egg)
Soil (analytical technique and LOQ)	LC-MS/MS, LOQ = 0.50 µg/kg
Water (analytical technique and LOQ)	LC-MS/MS, LOQ = 0.05 µg/L
Air (analytical technique and LOQ)	LC-MS/MS, LOQ = 4.5 µg/m^3
Body fluids and tissues (analytical technique and LOQ)	body fluids: LC-MS/MS. However, the method is not acceptably validated. body tissues: no method has been given. According to the new data requirements, methods for body fluids and tissues are always required.

Classification and labelling with regard to physical and chemical data (Regulation (EU) N° 283/2013, Annex Part A, point 10)

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Section 1 Identity, Physical/ Chemical Properties, Details of Uses, Further Information, Methods of Analysis

Substance	name
Harmonised classification according to Regulation (EC) No 1272/2008 and its Adaptations to Technical Process [Table 3.1 of Annex VI of Regulation (EC) No 1272/2008 as amended][1]:	
Peer review proposal [2] for harmonised classification according to Regulation (EC) No 1272/2008:	

[1] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. OJ L 353, 31.12.2008, 1-1355.

[2] It should be noted that harmonised classification and labelling is formally proposed and decided in accordance with Regulation (EC) No 1272/2008. Proposals for classification made in the context of the evaluation procedure under Regulation (EC) No 1107/2009 are not formal proposals.

Section 2 Mammalian Toxicology

Impact on Human and Animal Health

Absorption, distribution, metabolism and excretion (toxicokinetics) (Regulation (EU) N° 283/2013, Annex Part A, point 5.1)

Rate and extent of oral absorption/systemic bioavailability	app. 80% (based on urinary excretion within 48 h, single dose administration high and low dose level, repeated dose, intravenous dose)
Toxicokinetics	
Distribution	Three days after administration tissue levels were negligible (< 0.01% of the administered dose).
Potential for bioaccumulation	No evidence for accumulation.
Rate and extent of excretion	Rapid and extensive (at minimum app. 77 % within 48 h), mainly via urine (≥71 % within 24 h, app. 1-4 % via faeces)
Metabolism in animals	Not metabolised in rats.
In vitro metabolism	No unique human metabolites formed, no observed metabolism.
Toxicologically relevant compounds (animals and plants)	Parent compound (clopyralid)
Toxicologically relevant compounds (environment)	No environmental degradation products or ecotoxicologically relevant metabolites.

Acute toxicity (Regulation (EU) N° 283/2013, Annex Part A, point 5.2)

Rat LD_{50} oral	> 5000 mg/kg bw	
Rat LD_{50} dermal	> 2000 mg/kg bw	
Rat LC_{50} inhalation	> 1.0 mg/L/4h (nose only, highest attainable concentration)	
Skin irritation	Non-irritant	
Eye irritation	Severe irritant	**H318**
Skin sensitisation	No acceptable study available.	
Phototoxicity	Could not be determined from the available data	

Short-term toxicity (Regulation (EU) N° 283/2013, Annex Part A, point 5.3)

Target organ / critical effect	Rat: stomach (histopathological changes/ acanthosis and folding of non-glandular epithelium of the limiting ridge), liver and	

	kidney (weight ↑) Mouse: liver (relative weight ↑, microscopical changes) Dog: haematological effects, liver (weight ↑)	
Relevant oral NOAEL	4- week rat: < 150 mg/kg bw/day 3- month rat: < 300 mg/kg bw/day 13-week mouse: 750 mg/kg bw per day 12-month, dog: 100 mg/kg bw per day	
Relevant dermal NOAEL	21-day, rabbit: >1000 mg/kg bw per day	
Relevant inhalation NOAEL	No data - not required	

Genotoxicity (Regulation (EU) N° 283/2013, Annex Part A, point 5.4)

In vitro studies	Ames test: negative *In vitro* mammalian cell forward mutation: negative *In vitro* chromosome aberration test: equivocal	
In vivo studies	No acceptable studies available.	
Photomutagenicity	No data	
Potential for genotoxicity	Clastogenic and aneugenic potential of clopyralid not excluded.	

Long-term toxicity and carcinogenicity (Regulation (EU) N°283/2013, Annex Part A, point 5.5)

Long-term effects (target organ/critical effect)	Rat: Stomach (lesions of the gastric limiting ridge) Mouse: body weight ↓	
Relevant long-term NOAEL	2-year, rat: 15 mg/kg bw per day 2-year, mouse: 500 mg/kg bw per day	
Carcinogenicity (target organ, tumour type)	Rat: no evidence that clopyralid caused increased incidence of malignant or non-malignant tumours Mouse: no evidence that clopyralid caused increased incidence of malignant or non-malignant tumours Clopyralid is unlikely to pose a hazard to humans	
Relevant NOAEL for carcinogenicity	2-year, rat: >1500 mg/kg bw per day 2-year, mouse: > 2000 mg/kg bw per day	

Reproductive toxicity (Regulation (EU) N° 283/2013, Annex Part A, point 5.6)
Reproduction toxicity

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Section 2 Mammalian Toxicology

Reproduction target / critical effect	Parental toxicity: body weight ↓, food consumption ↓, stomach lesions Reproductive toxicity: a potential of reproductive toxicity is unlikely Offspring's toxicity: F1 pup weights↓, liver weight↑	
Relevant parental NOAEL	150 mg/kg bw per day	
Relevant reproductive NOAEL	>1500 mg/kg bw per day	
Relevant offspring NOAEL	500 mg/kg bw per day	

Developmental toxicity

Developmental target / critical effect	Rat: Maternal toxicity: liver weight↓, food consumption↓ Developmental toxicity: no treatment related malformations Rabbit: Maternal toxicity: body weight↓, body weight gain↓, gastric lesions, clinical signs, morbidity Developmental toxicity: mean foetal weight↓, slightly increased spontaneous malformations	
Relevant maternal NOAEL	Rat: 15 mg/kg bw per day Rabbit: 110 mg/kg bw per day	
Relevant developmental NOAEL	Rat: >250 mg/kg bw per day Rabbit: 110 mg/kg bw per day	

Neurotoxicity (Regulation (EU) N° 283/2013, Annex Part A, point 5.7)

Acute neurotoxicity	Study not required	
Repeated neurotoxicity	Study not required	
Additional studies (e.g. delayed neurotoxicity, developmental neurotoxicity)	No studies submitted	

Other toxicological studies (Regulation (EU) N° 283/2013, Annex Part A, point 5.8)

Supplementary studies on the active substance	A comparison of technical material produced by two different manufacturing processes showed similar toxicity profiles. Assessment of immunotoxic potential of clopyralid, after 28- day dietary exposure to rats: NOAEL 150 mg/kg bw/day (increased thymus weight).
Endocrine disrupting properties	No studies submitted. Clopyralid does not fulfill the interim criteria for endocrine disruptive properties

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Section 2 Mammalian Toxicology

Studies performed on metabolites or impurities	No studies submitted.

Medical data (Regulation (EU) N° 283/2013, Annex Part A, point 5.9)

No detrimental effects on health in manufacturing personnel.

Summary[3] (Regulation (EU) N°1107/2009, Annex II, point 3.1 and 3.6)	Value (mg/kg bw (per day))	Study	Uncertainty factor
Acceptable Daily Intake (ADI)	0.15	rat, 2-year chronic toxicity and oncogenicity study	100
Acute Reference Dose (ARfD)			
Acceptable Operator Exposure Level (AOEL)	0.15	rat, developmental study	100
Acute Acceptable Operator Exposure Level (AAOEL)			

* Including correction for limited oral absorption/bioavailability (xx %).

Dermal absorption (Regulation (EU) N° 284/2013, Annex Part A, point 7.3)

Representative formulation (GF-1374, EC, 80 g clopyralid/L)	Concentrate: 25 % Spray dilution: 75 % Default dermal absorption values according to Guidance on Dermal Absorption, EFSA 2012.

Exposure scenarios (Regulation (EU) N° 284/2013, Annex Part A, point 7.2)

Operators	Use: winter cereal and established permanent pasture, tractor mounted sprayer, application rate 0.12 kg clopyralid/ha
	Exposure estimates (model): % of AOEL
	UK POEM
	Without PPE: 583
	PPE (gloves): 82
	German model
	Without PPE: 244
	PPE (gloves, coverall, sturdy footwear): 16

[3] If available include also reference values for metabolites

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Section 2 Mammalian Toxicology

	EFSA model	
	Without PPE:	101
	PPE (gloves and work wear):	3
Workers	Crop inspection	% of AOEL
	Europoem II	
	Without PPE:	15
	EFSA model	
	Without PPE:	8
Bystanders and residents	**Bystander**	% of AOEL
	Europoem II:	2
	Martin et al., adult:	6
	child:	7
	Exposure to vapours	
	adult:	0.15
	child:	0.7
	Resident	
	Martin et al., adult:	0.39
	child:	0.64
	EFSA model, adult:	3
	child:	12

Classification with regard to toxicological data (Regulation (EU) N° 283/2013, Annex Part A, Section 10)

Substance :	Clopyralid
Harmonised classification according to Regulation (EC) No 1272/2008 and its Adaptations to Technical Process [Table 3.1 of Annex VI of Regulation (EC) No 1272/2008 as amended][4] :	Eye Dam. 1 - H318"Causes serious eye damage"
Peer review proposal [5] for harmonised classification according to Regulation (EC) No 1272/2008:	Eye Dam. 1 - H318 "Causes serious eye damage"

[4] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. OJ L 353, 31.12.2008, 1-1355.

[5] It should be noted that harmonised classification and labelling is formally proposed and decided in accordance with Regulation (EC) No 1272/2008. Proposals for classification made in the context of the evaluation procedure under Regulation (EC) No 1107/2009 are not formal proposals.

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Section 3 Residues

Section 3 Residues in or on treated products food and feed

Metabolism in plants (Regulation (EU) N° 283/2013, Annex Part A, points 6.2.1, 6.5.1, 6.6.1 and 6.7.1)

Primary crops (Plant groups covered)
OECD Guideline 501

Crop groups	Crop(s)	Application(s)	DAT (days)
Fruit crops			
Root crops	sugarbeet	300 g as/ha, BBCH 36, foliar	0, 28 and maturity
Leafy crops	cabbage	0.42 kg as/ha, foliar at at the 8 – 10 leaf stage	up to 38
Cereals/grass crops			
Pulses/Oilseeds	oilseed rape	300 g as/ha, foliar	0, 28 and maturity
Miscellaneous	pasture	1.121 kg as/ha Spring/summer	7, 14, 28, 56, and 126

Of cereals only uptake of clopyralid into wheat in a hydroponic setting has been studied. Pasture cannot fully be used to cover cereals. Furthermore the pasture study does not meet GLP requirements.

Rotational crops (metabolic pattern)
OECD Guideline 502

Crop groups	Crop(s)	PBI (days)	Comments
Root/tuber crops	Turnip Radish	319 30	The 30 DAT cabbage was not fully grown to maturity. The heads were collected before fully grown. The residues indicate similar results.
Leafy crops	Lettuce, Cabbage	125, 319 30	
Cereal (small grain)	Wheat	30, 125, 319	
Other			

Rotational crop and primary crop metabolism similar?: Yes

Processed commodities (standard hydrolysis study)
OECD Guideline 507

Conditions	Parent % of initial dose			
20 min, 90°C, pH 4	99.3			
60 min, 100°C, pH 5	96.9			
20 min, 120°C, pH 6	97.1			

Residue pattern in processed commodities similar to residue pattern in raw commodities?:

No changes proposed in residue definition on basis of hydrolysis test.

Only parent has been tested. Clopyralid conjugates are major residue species and included in the proposed residue definitions and, consequently, should be tested for hydrolytic stability.

As far as olives are concerned, stability tests involving basic conditions (pH>7) are recommended due to the pH of the process employed in olive production.

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Finland	**May 2017**	**Clopyralid**

Section 3 Residues

Plant residue definition for monitoring (RD-Mo) **OECD Guidance, series on pesticides No 31**	Clopyralid, its salts and conjugates, expressed as clopyralid
Plant residue definition for risk assessment (RD-RA)	Clopyralid, its salts and conjugates, expressed as clopyralid
Conversion factor (monitoring to risk assessment)	Residue definitions are the same, i.e. conversion factor is not needed.

Metabolism in livestock (Regulation (EU) N° 283/2013, Annex Part A, points 6.2.2, 6.2.3, 6.2.4, 6.2.5 6.7.1)

OECD Guideline 503 and SANCO/11187/2013 rev. 3 (fish)	**Animal**	**Dose** (mg/kg bw/d)	**Duration** (days)	**N rate/comment**
Animals covered	Laying hen	11.4 mg a.i./kg bw/d	7	13N (both for max and median)
	Goat/Cow	1.852 kg a.i./day	7	2.5N -4.8N (max.) 4.5N – 8.3N (med.)
	Pig			Not considered necessary.
	Fish	mg/kg DM		No studies available
	In milk over 21% of TRR was found as conjugate X36538. Clopyralid comprised from 54% to over 70% of the TRR in milk, urine and feces. In the tissues unchanged clopyralid was the major residue species along with minor amounts of conjugate X36538.			

Time needed to reach a plateau concentration in milk and eggs (days)	For clopyralid residues in milk, steady state is reached within 2 days. For conjugates steady state is reached already on day 1. For eggs parent compound is stable from day 1 on.
Animal residue definition for monitoring (RD-Mo) **OECD Guidance, series on pesticides No 31**	Clopyralid, its salts and conjugates, expressed as clopyralid
Animal residue definition for risk assessment (RD-RA)	Clopyralid, its salts and conjugates, expressed as clopyralid
Conversion factor (monitoring to risk assessment)	Residue definitions are the same, i.e. conversion factor is not needed
Metabolism in rat and ruminant similar (Yes/No)	Yes
Fat soluble residues (Yes/No) **(FAO, 2009)**	No

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Section 3 Residues

Residues in succeeding crops (Regulation (EU) N° 283/2013, Annex Part A, point 6.6.2)

Confined rotational crop study (Quantitative aspect) **OECD Guideline 502**	In rotational crop intervals majority of the residue identified was clopyralid. Free and conjugated clopyralid was the most abundant residue at all PBIs. Clopyralid taken up by the plants as glucose conjugate of clopyralid.
Field rotational crop study **OECD Guideline 504**	Field rotational crop study currently on-going. Results from confined rotational residue study, when taking into account the less critical GAP supported for clopyralid AIR, indicate that residues in rotational crops planted after normal maturity / harvest of treated cereal crops is unlikely and that a further waiting period would not be needed.

Stability of residues (Regulation (EU) N° 283/2013, Annex Part A, point 6.1) Stability of residues (Regulation (EU) N° 283/2013, Annex Part A, point 6.1)

OECD Guideline 506

Plant products (Category)	**Commodity**	**T** (°C)	**Stability** (Month ~~Year~~)			
			0.5 mg/kg			
High water content	Pasture	-20	18			
High oil content	Oilseed rape	-20	24			
High oil content	Olive (processed)	-20	10			
High protein content						
High starch content	Corn	-20	12			
High acid content	Orange	-20	10			
Stability of conjugates have not been tested, though clopyralid conjugates are major metabolites comprising up to 50 % of TRR depending on crop studied.						
Animal	**Animal commodity**	**T** (°C)	**Stability** (Month/~~Year~~)			
Bovine	Muscle	-20	18			
Bovine	Liver	-20	18			
Bovine	Kidney	-20	18			
Bovine	Milk	-20	18			
Hen	Egg	-20	18			
Bovine	Fat	-20	24			
Stability of conjugates have not been tested, though clopyralid conjugates are major metabolites as well.						

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Section 3 Residues

Summary of residues data from the supervised residue trials (Regulation (EU) N° 283/2013, Annex Part A, point 6.3)

OECD Guideline 509, OECD Guidance, series on pesticides No 66 and OECD MRL calculator

Crop	**Region/ Indoor** (a)	**Residue levels** (mg/kg) **observed in the supervised residue trials relevant to the supported GAPs** (b)	**Recommendations/comments** (OECD calculations)	**MRL** proposals (mg/kg)	**HR** (mg/kg) (c)	**STMR** (mg/kg) (d)
Representative uses (row to be deleted if not relevant)						
Grass forage / pasture	N-EU	2.49,2.6, 2.8, 3.0, 3.48, 3.73, 4.4, 5.0, 5.4, 6.95	Livestock dietary burden is calculated based on the N EU STMR and HR since these values are greater than corresponding values from the S-EU trials.	---	6.95	3.61
Grass forage / pasture	S-EU	1.66, 2.49, 2.91, 3.06, 3.21, 3.31, 3.93, 4.09	See above	---	4.09	3.14
Cereal grain (combined barley and wheat)	N-EU	0.07, 0.14, 0.23, 0.24, 0.34, 0.37, 0.38, 0.47, 0.61, 0.73, 0.79, 0.82, 0.93, 0.95, 1.06, 1.11, 1.26	Combined results from barley and wheat trials for Active Approval. No change in MRL proposed since same data relied upon.	2	1.26	0.61
Cereal grain (combined barley and wheat)	S-EU	0.13, 0.26, 0.68, 0.68, 1.16, 1.16, 1.34, 1.42	Combined results from barley and wheat trials for Active Approval. STMR of 0.92 mg/kg based on S-EU data. Extrapolate to oat and rye. No change in MRL proposed since same data relied upon.	2	1.42	0.92
Cereal straw (combined barley and wheat)	N-EU	0.17, 0.26, 0.28, 0.31, 0.40, 0.50, 0.59, 0.79, 0.87, 0.93, 1.05, 1.06, 1.08, 1.11, 1.26	Combined results from barley and wheat trials for Active Approval. HR for straw based on N-EU	---	1.26	0.79
Cereal straw (combined barley and wheat)	S-EU	0.39, 0.59, 0.63, 0.84, 0.99, 1.16, 1.18, 1.20	Combined results from barley and wheat trials for Active Approval.	---	1.20	0.93
MRL application (row to be deleted if not relevant)						

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Section 3 Residues

Summary of the data on formulation equivalence OECD Guideline 509						
Crop	**Region**	**Residue data** (mg/kg)	**Recommendations/comments**			
Summary of data on residues in pollen and bee products (Regulation (EU) No 283/2013, Annex Part A, point 6.10.1)						
Product(s)	**Region**	**Residue data** (mg/kg)	**Recommendations/comments**			

(a): **NEU** or **SEU** for northern or southern **outdoor** trials in EU member states (**N+SEU** if both zones), **Indoor** for glasshouse/protected crops, **Country** if non-EU location.

(b): Residue levels in trials conducted according to GAP reported in ascending order (*e.g.* 3x <0.01, 0.01, 6x 0.02, 0.04, 0.08, 3x 0.10, 2x 0.15, 0.17). When residue definition for monitoring and risk assessment differs, use **Mo/RA** to differentiate data expressed according to the residue definition for **Mo**nitoring and **R**isk **A**ssessment.

(c): **HR**: Highest residue. When residue definition for monitoring and risk assessment differs, HR according to residue definition for monitoring reported in brackets (HR_{Mo}).

(d): **STMR:** Supervised Trials Median Residue. When residue definition for monitoring and risk assessment differs, STMR according to definition for monitoring reported in brackets ($STMR_{Mo}$).

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Section 3 Residues

Residues from livestock feeding studies (Regulation (EU) N° 283/2013, Annex Part A, points 6.4.1, 6.4.2, 6.4.3 and 6.4.4)

Inputs for animal burden calculations

Feed commodity	Median dietary burden		Maximum dietary burden	
	(mg/kg)	Comment	(mg/kg)	Comment
Representative uses (row to be deleted if not relevant)				
MRL application (row to be deleted if not relevant)				
Grass forage (pasture)	3.61	STMR, N-EU	6.95	HR, N-EU
Wheat / barley grain	0.92	STMR, N-EU, data from Active Approval	0.92	STMR, N-EU, data from Active Approval
Wheat bran (milled by products) / barley bran	5.61	Grain STMR of 0.92 mg/kg x mean processing factor of 6.1	5.61	Grain STMR of 0.92 mg/kg x mean processing factor of 6.1
Wheat / barley straw	0.93	STMR – SEU, data from Active Approval	1.26	HR – NEU, data from Active Approval

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Section 3 Residues

OECD Guideline 505 and OECD Guidance, series on pesticides No 73

MRL calculations	**Ruminant**				**Pig/Swine**		**Poultry**		**Fish**	
Highest expected intake (mg/kg bw/d) (mg/kg DM for fish)	Beef cattle	0.385	Ram/Ewe	0.891	Breeding	0.209	Broiler	0.142	Carp	0.385
	Dairy cattle	0.719	Lamb	0.726	Finishing	0.111	Layer	0.147	Trout	
							Turkey	0.140	Fish intake >0.1 mg/kg DM N/A	
Intake >0.004 mg/kg bw	Yes/No		Yes/No		Yes/No		Yes/No		Yes/No	
Feeding study submitted	Yes		Yes		Yes		Yes		No study submitted	
Representative feeding level (mg/kg bw/d, mg/kg DM for fish) and **N rates**	Level	Beef: N Dairy: N	Level	Lamb: N Ewe: N	Level	N rate Breed/Finish	Level	B or T: N Layer: N	Level	N rate Carp/Trout
	Estimated HR[a] at 1N	**MRL** proposals	Estimated HR[a] at 1N	**MRL** proposals	Estimated HR[a] at 1N	**MRL** proposals	Estimated HR[a] at 1N	**MRL** proposals	Estimated HR[a] at 1N	**MRL** proposals
Muscle	0.012	0.08	0.015	0.08	0.004	0.05	0.006	0.05		
Fat	0.065	0.07	0.081	0.09	0.019	0.05	0.002	0.05		
Meat[b]	0.023		0.028		0.006		0.005			
Liver	0.057	0.06	0.071	0.08	0.017	0.05	0.017	0.05		
Kidney	0.966	1	1.197	1.5	0.281	0.3	---	0.05		
Milk[a]	0.033	0.05	0.004	0.05						
Eggs							0.003	0.05		
Method of calculation[c]	Tf	Tf	Tf	Tf	Tf	Tf	Tf	Tf		

[a]: Estimated HR calculated at 1N level (**estimated mean level for milk**).
[b]: HR in meat calculated for mammalian on the basis of 20% fat + 80% muscle and 10% fat + 90% muscle for poultry
[c]: The OECD guidance document on residues in livestock (series on pesticides 73) recommends three different approaches to derive MRLs for animal products; by applying a transfer factor (Tf), by intrapolation (It) or by linear regression (Ln). Fill in method(s) considered to derive the MRL proposals.

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Section 3 Residues

STMR calculations	**Ruminant**				**Pig/Swine**		**Poultry**		**Fish**	
Median expected intake (mg/kg bw/d) (mg/kg DM for fish)	Beef cattle	0.224	Ram/Ewe	0.468	Breeding	0.147	Broiler	0.142	Carp	
	Dairy cattle	0.411	Lamb	0.442	Finishing	0.111	Layer	0.145	Trout	
							Turkey	0.140		
Representative feeding level (mg/kg bw/d, mg/kg DM for fish) and **N rates**	Level 0.451*	Beef: 2.01N Dairy: 1.1N	Level 0.451*	Lamb: 1N Ewe: 0.96N	Level 0.451*	3.1/4.1N Breed/Finish	Level 0.280	B or T: 2N Layer:1.93 N	Level N/A	N rate Carp/Trout
	Mean level in feeding level	Estimated **STMR**[(b)] at 1N	Mean level in feeding level	Estimated **STMR**[(b)] at 1N	Mean level in feeding level	Estimated **STMR**[(b)] at 1N	Mean level in feeding level	Estimated **STMR**[(b)] at 1N	Mean level in feeding level	Estimated **STMR**[(b)] at 1N
Muscle	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	---
Fat	0.023	0.021	0.023	0.024	0.023	<0.01	<0.01	<0.01	---	---
Meat[(a)]	0.013	0.012	0.013	0.013	0.013	<0.01	<0.01	<0.01		
Liver	0.032	0.029	0.032	0.033	0.032	0.010	0.019	<0.01		
Kidney	0.429	0.391	0.429	0.445	0.429	0.140	---	---		
Milk	<0.01	<0.01	<0.01	<0.01						
Eggs							<0.01	<0.01		
Method of calculation[(c)]	Tf	Tf	Tf	Tf	Tf	Tf	Tf	Tf		

[(a)]: STMR in meat calculated for mammalian on the basis of 20% fat + 80% muscle and 10% fat + 90% muscle for poultry

[(b)]: When the mean level is set at the LOQ, the STMR is set at the LOQ.

[(c)]: The OECD guidance document on residues in livestock (series on pesticide 73) recommends three different approaches to derive MRLs for animal products; by applying a transfer factor (Tf), by intrapolation (It) or by linear regression (Ln). Fill in method(s) considered to derive the MRL proposals.

* *Milk and muscle residues estimated based on feeding level of 1.67 mg/kg bw/day since residues were <0.01 at the 0.451 mg/kg bw/day feeding level. The 1.67 mg/kg bw/day feeding level is 7.46N for beef cattle, 4.06 N for dairy cattle, 3.57 N for Ram/ewe, 3.78 N for lamb, 11.4 N for breeding swine, and 15.04N for finishing swine

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Section 3 Residues

Conversion Factors (CF) for monitoring to risk assessment

Animal products Table to be deleted if not relevant (RD-Mo = RD-RA)

Conversion factors derived from the livestock feeding studies at the different feeding levels								
Study	**Ruminant/Pig**				**Poultry**			
Feeding levels	Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4
Muscle								
Fat								
Liver								
Kidney								
Milk								
Egg								
Comments (up to 250 characters)	CF=1 in all cases							

Plant products Table to be deleted if not relevant (RD-Mo = RD-RA)

Mean Conversion Factors (CF) calculated at the different PHIs in the supervised residues trials[(a)] **OECD Guidance, series on Pesticides No 66**								
PHI[(b)] (days)								**Comments**
Representative uses (row to be deleted if not relevant)								
MRL application (row to be deleted if not relevant)								
Current MRLs in force (Reg. (EU) No 322/2012, 17.4.2012) are based on residue definitions comprising of parent only. As the residue definition has been proposed to include conjugates as well, new MRL applications are consequently necessary.								

[(a)]: CF calculated at the supported PHI are underlined.
[(b)]: 0-/0+ for samples collected just before/after the last application

Processing factors (Regulation (EU) N° 283/2013, Annex Part A, points 6.5.2 and 6.5.3)

OECD Guideline 508 and OECD Guidance, series on testing and assessment No 96

Crop (RAC)/Edible part or Crop (RAC)/Processed product	**Number of studies**[(a)]	**Processing Factor** (PF)		**Conversion Factor** (CF_P) **for RA**[(b)]
		Individual values	Median PF	
Representative uses (row to be deleted if not relevant)				
Wheat / bran	4	3.5, 4.3, 6.1, 10.4	6.1 / 5.2	N/A
Wheat / white flour	4	0.1, 0.2, 0.3, 0.6	0.3 / 0.3	N/A
Wheat / wholemeal flour	2	0.8, 1.2	1 / 1	N/A
Wheat / germ	2	2.3, 4.3	3.3	N/A

Wheat / white bread	2	0.1, 0.1	0.1 / 0.1	N/A
Wheat / wholemeal bread	2	0.5, 0.6	0.6 / 0.6	N/A
Barley / malt sprouts	2	0.2, 0.2	0.2 / 0.2	N/A
Barley / brewing malt	2	0.6, 0.7	0.7 /0.7	N/A
Barley / spent grains and flocs	2	0.1, 0.2	0.2 / 0.2	N/A
Barley / brewer's yeast	2	0.1, 0.1	0.1 / 0.1	N/A
Barley / beer	2	0.1, 0.1	0.1 / 0.1	N/A
MRL application (row to be deleted if not relevant)				

[a]: Studies with residues in the RAC at or close to the LOQ should be disregarded (unless concentration)
[b]: When the residue definition for risk assessment differs from the residue definition for monitoring

Consumer risk assessment (Regulation (EU) N° 283/2013, Annex Part A, point 6.9)

Including all uses (representative uses and uses related to an MRL application).

ADI	0.15 mg/kg bw per day		
TMDI according to EFSA PRIMo	Highest TMDI:	27 % ADI	(UK, toddler, sugar beet root)
NTMDI, according to (to be specified)	Highest NTMDI:	XX % ADI	(MS, diet)
IEDI (% ADI), according to EFSA PRIMo	Highest IEDI:	XX % ADI	(MS, diet)
NEDI (% ADI), according to (to be specified)	Highest NEDI:	XX % ADI	(MS, diet)
Factors included in the calculations			
ARfD	aRfD for clopyralid has been considered unnecessary		
IESTI (% ARfD), according to EFSA PRIMo	Highest IESTI:	XX % ARfD	(Commodity)
NESTI (% ARfD), according to (to be specified)	Highest NESTI:	XX % ARfD	(commodity)
Factors included in IESTI and NESTI			

Consumer risk assessment limited to the representative uses **To be deleted if not relevant**

TMDI (% ADI), according to EFSA PRIMo	Highest TMDI:	XX % ADI	(MS, diet)
NTMDI (% ADI), according to (to be specified)	Highest NTMDI:	XX % ADI	(MS, diet)
IEDI (% ADI), according to EFSA PRIMo	Highest IEDI:	XX % ADI	(MS, diet)
NEDI (% ADI), according to (to be specified)	Highest NEDI:	XX % ADI	(MS, diet)
Factors included in the calculations			
IESTI (% ARfD, according to EFSA PRIMo)	Highest IESTI:	XX % ARfD	(Commodity)
NESTI (% ARfD, according to (to be specified)	Highest NESTI:	XX % ARfD	(commodity)
Factors included in IESTI and NESTI			

Additional contribution to the consumer intakes through drinking water resulting from groundwater

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Section 3 Residues

metabolite(s) expected to be present above 0.75 µg/L **To be deleted if not relevant**

Metabolite(s)	
ADI (mg/kg bw per day)	
Intake of groundwater metabolites (% ADI)	Adult (60 kg bw, 2 L): XX % ADI
WHO Guideline (WHO, 2009)	Child (10 kg bw, 1 L): XX % ADI
	Infant (5 kg bw, 0.75 L): XX % ADI

Proposed MRLs (Regulation (EU) No 283/2013, Annex Part A, points 6.7.2 and 6.7.3)

Code[a]	Commodity/Group	MRL/Import tolerance[b] (mg/kg) and Comments	
Plant commodities			
Representative uses (row to be deleted if not relevant)			
MRL application (row to be deleted if not relevant)			
Animal commodities			

(a): Commodity code number, as listed in Annex I of Regulation (EC) No 396/2005
(b): MRLs proposed at the LOQ, should be annotated by an asterisk (*) after the figure.

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Section 4 Environmental fate and behaviour

Route of degradation (aerobic) in soil (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.1.1)

Mineralisation after 100 days	CO_2: 47.5 – 65.5 % AR after 92 days, 72.9 – 83.3 % of AR after 374 days at 20 ºC, [2,6-pyridinyl-^{14}C]-label (n=5) (Baloch & Grant 1991) 64.9 - 70.3 % of AR after 90 days (n=4) (Wardrope 2009)
Non-extractable residues after 100 days	11.2 – 35.1 % of AR after 92 days at 20 ºC, [2,6-pyridinyl-^{14}C]-label (n=5) (Baloch & Grant 1991) 24.4 - 32.9 % after 90 days (n=4) (Wardrope 2009)
Metabolites requiring further consideration - name and/or code, % of applied (range and maximum)	No major metabolites in addition to CO_2 Unidentified minor metabolites: Max. 7.7% of AR at 20 ºC (Skinner & al. 1995) One unidentified polar metabolite < 3 % of AR at 20 ºC (Wardrope 2009)

Route of degradation (anaerobic) in soil (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.1.2)

Mineralisation after 100 days	No mineralisation
Non-extractable residues after 100 days	NER max 13.4 % of AR after 30 days
Metabolites that may require further consideration for risk assessment - name and/or code, % of applied (range and maximum)	no metabolites at 20 ºC, [2,6-pyridinyl-14C]-label (n=1)

Route of degradation (photolysis) on soil (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.1.3)

Metabolites that may require further consideration for risk assessment - name and/or code, % of applied (range and maximum)	No photoproducts were identified, DT_{50} >12 years, [2,6-pyridinyl-^{14}C]-label (n=1) (Batzer & al. 1994) DT_{50} 553 d (n=1) (Ponte 2014)
Mineralisation at study end	3 % CO_2 after 30 days (Batzer & al. 1994) 2.1 % CO_2 after 16 days (Ponte 2014)
Non-extractable residues at study end	NER max 5 % of AR after 30 days (Batzer & al. 1994) 4.3 % of AR after 16 days (Ponte 2014)

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Section 4 Environmental fate and behaviour

Rate of degradation in soil (aerobic) laboratory studies active substance (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.1.1 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.1)

Parent	**Dark aerobic conditions**						
Soil type	Biomass mgC/100g	pH[a)]	t. °C / % MWHC	DT_{50} /DT_{90} (d)	DT_{50} (d) 20 °C pF2/10kPa[b)]	St. (χ^2)	Method of calculation
Parabraunerde (silt loam)	47	7.7	20 / 18.63 [c]	44.4 / 147.3	34.2	6.796	SFO
Marcham (sandy clay loam)	170	8.3	20 / 20.19 [c]	34.5 / 114.7	32.4	5.478	SFO
Castle Rising (sandy loam)	313	8	20 / 65.13 [c]	26.3 / 87.3	26.3	8.284	SFO
Speyer 2.1 (sand)	NA	6.5	20 / 12.58 [c]	64.6 / 214.6	64.6	5.466	SFO
Speyer 2.2 (sand)	110	6.3	20 / 18.56 [c]	16.2 / 53.8	16.2	7.78	SFO
Mississippi (silty clay loam)	11.92	6	25 / 23.42 [d]	8.6 / 28.5	11.6	6.49	SFO
A (sandy loam)	33.2	5.8	20 / 24.28 [e]	16.5 / 54.8	16.5	4.856	SFO
B (clay)	78.2	7.1	20 / 28.05 [e]	23 / 76.4	15.9	6.767	SFO
C (clay loam)	48.5	5.1	20 / 48.17 [e]	4.9 / 16.2	4.9	12.73	SFO
D (clay loam)	70.9	7	20 / 35.30 [e]	9.8 / 32.4	9.8	10.17	SFO
Geometric mean (if not pH dependent)					18.4		
pH dependence					No		

[a)] Measured in water
[b)] Normalised using a Q10 of 2.58 and Walker equation coefficient of 0.7
[c)] Reported soil moisture: 40% of maximum WHC
[d)] Reported soil moisture: 75% of 1/3 bar WHC
[e)] Reported soil moisture: 45% WHC

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Rate of degradation field soil dissipation studies (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.2.1 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.2.1)

Parent	**Aerobic conditions**								
Soil type (indicate if bare or cropped soil was used).	Location (country or USA state).	*X*[6]	pH[a)]	Depth (cm)	DT_{50} (d) actual	DT_{90}(d) actual	St. (χ^2)	DT_{50} (d) Norm[b)]	Method of calculation
Loamy sand (bare)	Bargstedt, Germany		4.3	0-100	21	69.6	23.9	13	SFO / SFO
Loam (bare)	Wilson, UK		6.2	0-100	16.7	55.6	22.6	13.5	SFO / SFO
Silty clay loam (bare)	Sermaises, France		7	0-100	16.3	54	19.3	7.5	SFO / SFO
Silty clay loam (bare)	Ansonville, France		8.2	0-20	0.16	12.1	5.36	2.07	DFOP / SFO
Clay loam (bare)	Spalding, UK		7.8	0-20	0.61	47.4	16.8	-[c]	DFOP / -
Clay loam (bare)	Mainbervilliers, France		7.1	0-20	6.04	28.3	7.22	2.7	DFOP / SFO
Silty clay loam (bare)	Oederquart, Germany		7.5	0-20	16.2	53.9	12	5.69	SFO / SFO
Sandy clay loam (bare)	Middlefart, Denmark		7.5	0-20	23.7	78.7	13.1	8.46	SFO / SFO
Clay loam (bare)	Canals, Spain		8.0	0-100	13.7	45.5	19.2	12.3	SFO / SFO
Silt loam (bare)	Elne, Southern France		6.3	0-100	*(49.3)*[d]	*(164)*[d]	*(49.3)*[d]	-[c]	*(SFO)*[d] / -
Geometric mean (if not pH dependent), n = 8								6.76	
pH dependence					No				

[a)] Measured in water
[b)] Normalised using a Q10 of 2.58 and Walker equation coefficient of 0.7, values are DegT50matrix
[c)] No statically reliable fit could be obtained
[d)] Model fit not statistically or visually acceptable (according to FOCUS, 2006, 2014)

[6] X This column is reserved for any other property that is considered to have a particular impact on the degradation rate. Column and this footnote may be removed if not used.

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Combined laboratory and field kinetic endpoints for modelling (when not from different populations)*

Rate of degradation in soil active substance, normalised geometric mean (if not pH dependent)	Laboratory and field kinetic endpoints for modelling are from different populations according to EFSA calculator tool.	
Rate of degradation in soil transformation products, normalised geometric mean (if not pH dependent)	Not relevant	Not relevant
Kinetic formation fraction (f. f. k_f / k_{dp}) of transformation products, arithmetic mean	Not relevant	Not relevant

* Only relevant after implementation of the published EFSA guidance describing how to amalgamate laboratory and field endpoints.

Soil accumulation (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.2.2 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.2.2)

Soil accumulation and plateau concentration	Not relevant since trigger is not exceeded.

Rate of degradation in soil (anaerobic) laboratory studies active substance (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.1.3 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.1)

Parent	**Dark anaerobic conditions**						
Soil type	Biomass mgC/100g	pH[a)]	t. °C / % MWHC	DT_{50} / DT_{90} (d)	DT_{50} (d) 20 °C[b)]	St. (χ^2)	Method of calculation
Sandy loam	8.9	7.4	20 / 59.6	>1 year	> 1year	n/a	First-order
Geometric mean (if not pH dependent)							

[a)] Measured in 0.01M CaCl2
[b)] Normalised using a Q10 of 2.58

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Rate of degradation on soil (photolysis) laboratory active substance (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.1.3

Parent	**Soil photolysis**					
Soil type	Biomass mgC/100g	pH[a)]	t. °C / % MWHC	DT_{50} / DT_{90} (d) calculated at ??°N	St. (χ^2)	Method of calculation
Sandy loam	167	5.4	20 / 75% FMC at 1/3 bar	> 1 year	[b]	SFO

[a)] Measured in water
[b)] Not reported

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Soil adsorption active substance (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.3.1.1 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.2.1)

Parent							
Soil Type	OC %	Soil pH[a)]	K_d (mL/g)	K_{doc} (mL/g)	K_F (mL/g)	K_{Foc} (mL/g)	1/n
Merzenhausen	1.00	7.19	0.051	Not Calculated	0.0057	0.57[b]	0.5577
Kaldenkirchen	0.98	5.34	0.048		0.0267	2.72[b]	0.8602
Lanna	2.06	6.62	0.151		0.0054	0.26[b]	0.3881
Overhetfeld	0.93	6.49	0.032		0.0125	1.34[b]	0.7830
Calke sandy loam	3.15	5.7	0.139[b]	Not Calculated	0.01	0.5	0.489
Longwoods sandy loam	3.13	7.4	0.069[b]		0.08	2.5	1.047
LUFA 2.1 loamy sand	0.68	4.9	0.040[b]		0.03	4.1	0.889
Quilen loam	4.02	6.9	0.356[b]		0.16	3.9	0.804
DU-L-PF clay loam	6.47	6.3	0.282[b]		0.14	2.1	0.829
Geometric mean (if not pH dependent)*					0.026	1.41	
Arithmetic mean (if not pH dependent)							0.739
pH dependence			No				

[a)] Measured calcium chloride solution

[b)] Calculated and reported in M-CA, not in the study report

[c)] For modelling each soil was checked against OECD 106 reliability criterion (Kd > 0.1 for direct method and Kd > 0.3 for indirect method). Freundlich coefficient of soils not meeting the criterios was set to 0.9. The resulting arithmetic mean of 1/n for modelling is 0.836.

* Only relevant after implementation of the published EFSA guidance.

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Mobility in soil column leaching active substance (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.4.1.1 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.2.1)

Column leaching	Not relevant
	Not relevant

Mobility in soil column leaching transformation products (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.4.1.2 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.2.1)

Column leaching	Not relevant
	Not relevant

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Lysimeter / field leaching studies (Regulation (EU) N° 283/2013, Annex Part A, points 7.1.4.2 / 7.1.4.3 and Regulation (EU) N° 284/2013, Annex Part A, points 9.1.2.2 / 9.1.2.3)

Lysimeter/ field leaching studies 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. The data have however been attached as additional information, as evaluated during the first approval of clopyralid.	1) Germany, spring application of 150 or 200 g clopyralid/ha on oilseed rape + partly a second application of 125 g a.s./ha on winter wheat 1 year later: A total of 935 mm of precipitation was received in year 1 and 895.5 mm in year 2. 438 – 478 L of leachate was collected in year 1 and 411-437 L in year 2. In the first year of application the annual average concentration in leachate was < 0.050 µg/L ai equivalent, however occasional exceedings of 0.10 µg/L were detected. In the second year the annual average concentration in leachate was < 0.055 µg/L. In the soil cores the majority of radioactivity remained in the top layers of 0 – 40 cm. 11.49 – 12.38 % of AR was found in soil 2 years after the single application. In the third year the annual average concentration in leachate was 0.001 – 0.019 µg/L. Maximum concentration of ai equivalents in leachate of the third year was 0.043 µg/L in the lysimeter which received two applications. In the soil cores 9.82 – 10.11 % of RA was found 2 years after the second application. The total recovery of RA in the three year monitoring period was 12.81 – 17.53 % of the applied RA, considering the both applications. 2) Germany, winter oilseed rape, 120 or 141 g clopyralid/ha, 847 and 1011 mm rain in years 1 and 204 – 417 mm of leachate was collected in two lysimeters in years 1 and 2. In the lysimeter with higher application rate the annual average concentration of unidentified radioactivity was 0.127 µg/L equivalent in year 1, but taken over the whole study period of two years, the average concentration was 0.064 – 0.078 µg/L equivalent. Occasional exceedings of 0.1 µg/L were detected soon after the application in both lysimeters. 3) Germany, sugar beet, spring application of 118 g clopyralid/ha, 754 and 871 mm rainfall in years 1 and 2: 113 and 196 mm of leachate was collected in years 1 and 2. Annual average concentrations of clopyralid were 0.010 and 0.002 µg/L in years 1 and 2. Non-extractable radioactivity was also present in the leachate at annual average concentrations of 0.113 and 0.031 µg/L equivalent in years 1 and 2, respectively. Dissolved CO_2 was the major metabolite observed in the leachate. 24.6 % of AR was measured in soil after 111 days, and after 2 years 13.2 % of AR was recovered.

4) Germany, sugar beet, spring application of 99 or 185 g clopyralid/ha, ca 700 mm rainfall/year: In year 1 the leachate volume was 180 and 248 mm, and in year 2 70 to 79 mm. Annual average concentrations in the leachate were not calculated, but in individual samples the clopyralid concentrations up to 0.135 µg/L were detected occasionally. 26 months after application 20 % of AR was recovered from the soil, majority of it in tillage layer (0 – 30 cm).

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Hydrolytic degradation (Regulation (EU) N° 283/2013, Annex Part A, point 7.2.1.1

Hydrolytic degradation of the active substance and metabolites > 10 %	pH 4, 50 ºC: DT_{50} >1 year (Smith 2000)
	pH 7: 50 ºC: DT_{50} >1 year
	pH 9: 50 ºC: DT_{50} >1 year

Aqueous photochemical degradation (Regulation (EU) N° 283/2013, Annex Part A, points 7.2.1.2 / 7.2.1.3)

Photolytic degradation of active substance and metabolites above 10 %	Xenon lamp for an equivalent of 41.6 days of summer sunlight at 40 ºN, DT_{50} ca 38000 days, no photolytic degradation products in aqueous sterile buffer could be observed. Photolysis is not a significant route of degradation of clopyralid in waters
Quantum yield of direct phototransformation in water at Σ > 290 nm	1.01 x· 10^{-6} mol · Einstein $^{-1}$ (Ponte 2014)

'Ready biodegradability' (Regulation (EU) N° 283/2013, Annex Part A, point 7.2.2.1)

Readily biodegradable (yes/no)	No: in the Modified Sturm Test the cumulative CO_2 production of clopyralid was 5-10% of the theoretical maximum after 27 days. (Jenkins 1991)

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Aerobic mineralisation in surface water (Regulation (EU) N° 283/2013, Annex Part A, point 7.2.2.2 and Regulation (EU) N° 284/2013, Annex Part A, point 9.2.1)

Parent										
System identifier (indicate fresh, estuarine or marine)	pH water phase	pH sed [a]	t. °C[b]	DT_{50} /DT_{90} whole sys. (suspended sediment test)		St. (χ^2)	DT_{50} /DT_{90} Water (pelagic test)		St. (χ^2)	Method of calculation
				At study temp	Normalised to *x* °C[c]		At study temp	Normalised to x °C[c]		
Fresh water (lake), 10.3 µg/L	7.3	NA	20	NA	NA	NA	Stable		NA	No degradation
Fresh water (lake), 83.1 µg/L	7.3	NA	20	NA	NA	NA	Stable[d] 1107 d		0.7547	SFO

[a] Measured in [medium to be stated, usually calcium chloride solution or water]
[b] Temperature of incubation=temperature that the environmental media was collected or std temperature of 20°C
[c] Normalised using a Q10 of 2.58 to the temperature of the environmental media at the point of sampling. (note temp of x should be stated).
[d] No significant difference in the degradation was observed between the high dose, low dose and sterile samples

System identifier (indicate fresh, estuarine or marine)	pH water phase	pH sed	Mineralisation *x* % after *n* d. (end of the study).	Non-extractable residues. max *x* % after *n* d (suspended sediment test)
Fresh water (lake), 10.3 µg/L	7.3	NA	0.1% after 48 d	NA
Fresh water (lake), 83.1 µg/L	7.3	NA	1.0% after 60 d (end of study)	NA

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Water / sediment study (Regulation (EU) N° 283/2013, Annex Part A, point 7.2.2.3 and Regulation (EU) N° 284/2013, Annex Part A, point 9.2.2)

Parent Clopyralid	**Distribution: max in water 100.13 % at 0d, 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 / sediment system	pH water phase	pH sed [a]	t. °C	DT_{50} /DT_{90} whole sys.	St. (χ^2)	DT_{50} /DT_{90} water	St. (χ^2)	DT_{50} /DT_{90} sed	St. (χ^2)	Method of calculation
Loamy sand	6.5	5.5	20	Not determined	n/a	128	n/a	Not determined	n/a	First-order
Sandy silt loam	8.16	7.7	20	Not determined	n/a	167	n/a	Not determined	n/a	First-order
Geometric mean at 20°C[b]						148				

[a] Measured in [medium to be stated, usually calcium chloride solution or water]
[b] Normalised using a Q10 of 2.58

Water / sediment system	pH water phase	pH sed	Mineralisation x % after n d. (end of the study).	Non-extractable residues in sed. max x % after n d
Loamy sand	6.5	5.5	2% after 100 d	5% at 100 d
Sandy silt loam	8.1	7.7	5% after 100 d	5% at 100 d

(Hall & al. 2002)

Fate and behaviour in air (Regulation (EU) N° 283/2013, Annex Part A, point 7.3.1)

Direct photolysis in air	No data submitted nor required
Photochemical oxidative degradation in air	Atkinson calculation using AOPWIN v.1.90 DT_{50} = 19.5 days (Madsen 2002)
Volatilisation	BBA guideline: from plant surfaces: ≤4 % in 24 hours (Day & Rudel 1994)
	BBA guideline: from soil: <2 % in 24 hours (Day & Rudel 1994)

Residues requiring further assessment (Regulation (EU) N° 283/2013, Annex Part A, point 7.4.1)

Environmental occurring residues requiring further assessment by other disciplines (toxicology and ecotoxicology) and or requiring consideration for groundwater exposure	Soil: Clopyralid Surface water: Clopyralid Sediment: Cloypralid Ground water: Clopyralid Air: -

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Definition of the residue for monitoring (Regulation (EU) N° 283/2013, Annex Part A, point 7.4.2)

	See section 5, Ecotoxicology

Monitoring data, if available (Regulation (EU) N° 283/2013, Annex Part A, point 7.5

Soil (indicate location and type of study)	No data provided nor required.
Surface water (indicate location and type of study)	Survey on monitoring data in Europe in 2006-2015 (Aldous & al. 2015): Surface freshwater monitoring data showed that clopyralid was monitored in eleven countries (Austria, Belgium (Wallonia), Czech Republic, Finland, France, Norway, Slovakia, Sweden, Switzerland, the Netherlands and the United Kingdom). It was generally more frequently found and at higher concentrations than in groundwater, though with more variability as is typical of surface freshwater. There were greater than 1,678 sites monitored and 21,159 samples analysed. Clopyralid was detected and exceeded 0.1 µg l^{-1} in ≥4,172 samples which represented ≤19.71% of all samples. However, there were LoDs >0.1 µg l^{-1} and this has exaggerated the number of samples exceeding the limit. Maximum concentrations in excess of the 0.1 µg l^{-1} drinking water limit were reported in the Czech Republic, Finland, France, Norway, Slovakia, Sweden, Switzerland and the United Kingdom (England, and Scotland).
Ground water (indicate location and type of study)	Survey on monitoring data in Europe in 2007-2015 (Aldous & al. 2015): Groundwater monitoring data showed that clopyralid was only monitored in groundwater in eight countries (Austria, Belgium (Wallonia), Czech Republic, Ireland, Norway, Slovakia, Sweden and the United Kingdom). There were greater than 4,459 sites and over 24,538 samples. Clopyralid was detected and exceeded the 0.1 µg l^{-1} drinking water limit in ≤0.35% of groundwater samples (≤85 samples). Maximum concentrations in excess of 0.1 µg l^{-1} were reported in Belgium (Wallonia), Czech Republic, Slovakia, Sweden and the United Kingdom (England and Wales). A maximum clopyralid concentration of 17.1 µg l^{-1} was reported in the Czech Republic.
Air (indicate location and type of study)	No data provided nor required.

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PEC soil (Regulation (EU) N° 284/2013, Annex Part A, points 9.1.3 / 9.3.1)

Parent	DT_{50} (d): 23.7 days
Method of calculation	Kinetics: SFO
	Field or Lab: representative worst case from field studies
Application data	Crop: winter cereals (BBCH 13), established grasslands
	Depth of soil layer: 5 cm
	Soil bulk density: 1.5 g/cm^3
	% plant interception: 0% (winter cereals), 90% (grassland)
	Number of applications: 1
	Interval (d): N/A
	Application rate(s): 80 g a.s./ha (winter cereals), 120 g a.s./ha (grassland)

Winter cereals

$PEC_{(s)}$ (mg/kg)	**Single application Actual**	**Single application Time weighted average**	**Multiple application Actual**	**Multiple application Time weighted average**
Initial	0.107		-	
Short term 24h	0.104	0.105	-	-
2d	0.101	0.104		
4d	0.095	0.101		
Long term 7d	0.087	0.096	-	-
28d	0.047	0.073		
50d	0.025	0.056		
100 d	0.006	0.035		
Plateau concentration	Not required			

Grassland

$PEC_{(s)}$ (mg/kg)	**Single application Actual**	**Single application Time weighted average**	**Multiple application Actual**	**Multiple application Time weighted average**
Initial	0.016		-	
Short term 24h	0.016	0.016	-	-
2d	0.015	0.016		
4d	0.014	0.015		

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Long term 7d	0.013	0.014	-	-
28d	0.007	0.011		
50d	0.004	0.008		
100d	0.001	0.005		
Plateau concentration	Not required			

PEC ground water (Regulation (EU) N° 284/2013, Annex Part A, point 9.2.4.1)

Method of calculation and type of study (*e.g.* modelling, field leaching, lysimeter)	(Robinson 2016) Modelling using FOCUS model(s), with appropriate FOCUSgw scenarios, according to FOCUS guidance. Model(s) used: FOCUS PEARL v4.4.4, FOCUS PELMO v.5.5.3, FOCUS MACRO v.5.5.4 For FOCUS gw modelling, values used: Crop: winter cereals, grassland Plant Uptake Factor: 0 / 0.5 Water solubility (mg/L): 1.43 x 10^5 at pH 7 and 20°C Vapour pressure: set to 0 Pa as worst case Geometric mean parent $DT_{50\ field}$ 6.76 d (n = 8) (normalisation to pF2, 20°C with Q10 of 2.58) K_{FOC}: parent, geometric mean 1.41 mL/g (n = 9), arithmetic mean $^1/_n$= 0.836 (n = 9) Metabolites: -
Application rate	Gross application rate: 80 g a.s./ha (winter cereals), 120 g a.s./ha (grassland) Crop growth stage: BBCH 13 (winter cereals), established (grassland) Canopy interception %: 0% (winter cereals), 90% (grassland) Application rate net of interception: 80 g a.s./ha (winter cereals), 12 g a.s./ha (grassland) No. of applications: 1/ year Time of application (absolute or relative application dates): 1st of each month (Feb – Jun for winter cereals, Feb –Aug for grassland)

* Only relevant after implementation of the published EFSA guidance.

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PEC(gw) - FOCUS modelling results (80th percentile annual average concentration at 1m) following annual application to winter cereals 1 x 80 g clopyralid/ha. PUF = 0.

FOCUS PEARL/ winter cereals	Scenario	Parent (µg/L)				
		1-Feb	1-Mar	1-Apr	1-May	1-Jun
	Chateaudun	0.018	0.005	0.004	0.010	0.009
	Hamburg	0.312	0.176	0.097	0.178	0.426
	Jokioinen	0.513	0.238	0.152	0.162	0.287
	Kremsmunster	0.194	0.089	0.100	0.100	0.120
	Okehampton	0.341	0.179	0.095	0.165	0.191
	Piacenza	0.147	0.070	0.055	0.039	0.007
	Porto	0.351	0.049	0.012	0.005	0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001	<0.001

FOCUS PELMO/ winter cereals	Scenario	Parent (µg/L)				
		1-Feb	1-Mar	1-Apr	1-May	1-Jun
	Chateaudun	0.013	0.007	0.004	0.004	0.003
	Hamburg	0.916	0.459	0.113	0.041	0.063
	Jokioinen	3.00	2.32	0.697	0.191	0.259
	Kremsmunster	0.385	0.166	0.137	0.085	0.104
	Okehampton	0.775	0.520	0.149	0.156	0.196
	Piacenza	0.760	0.208	0.144	0.027	0.003
	Porto	1.77	0.156	0.012	0.005	0.001
	Sevilla	0.004	<0.001	<0.001	<0.001	<0.001
	Thiva	0.011	<0.001	<0.001	<0.001	<0.001

FOCUS MACRO/ winter	Scenario	Parent (µg/L)				
		1-Feb	1-Mar	1-Apr	1-May	1-Jun
	Chateaudun	0.021	0.005	0.002	0.003	0.002

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PEC(gw) - FOCUS modelling results (80th percentile annual average concentration at 1m) following annual application to winter cereals 1 x 80 g clopyralid/ha. PUF = 0.5

	Scenario	Parent (µg/L)				
		1-Feb	1-Mar	1-Apr	1-May	1-Jun
FOCUS PEARL/ winter cereals	Chateaudun	0.015	0.003	0.003	0.007	0.008
	Hamburg	0.199	0.111	0.057	0.114	0.303
	Jokioinen	0.272	0.110	0.074	0.096	0.194
	Kremsmunster	0.153	0.062	0.069	0.069	0.091
	Okehampton	0.312	0.125	0.056	0.099	0.138
	Piacenza	0.119	0.054	0.035	0.030	0.007
	Porto	0.309	0.037	0.009	0.004	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001	<0.001

	Scenario	Parent (µg/L)				
		1-Feb	1-Mar	1-Apr	1-May	1-Jun
FOCUS PELMO/ winter cereals	Chateaudun	0.010	0.005	0.002	0.003	0.002
	Hamburg	0.726	0.242	0.056	0.016	0.032
	Jokioinen	2.08	1.55	0.338	0.074	0.123
	Kremsmunster	0.286	0.104	0.089	0.051	0.068
	Okehampton	0.630	0.367	0.089	0.083	0.124
	Piacenza	0.619	0.165	0.126	0.023	0.003
	Porto	1.64	0.129	0.009	0.004	0.001
	Sevilla	0.004	<0.001	<0.001	<0.001	<0.001
	Thiva	0.010	<0.001	<0.001	<0.001	<0.001

	Scenario	Parent (µg/L)				
		1-Feb	1-Mar	1-Apr	1-May	1-Jun
FOCUS MACRO/ winter	Chateaudun	0.020	0.004	0.001	0.002	0.001

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Section 4 Environmental fate and behaviour

PEC(gw) - FOCUS modelling results (80th percentile annual average concentration at 1m) following annual application to grassland 1 x 120 g clopyralid/ha. PUF = 0.

	Scenario	**Parent (µg/L)**						
FOCUS PEARL/ grassland		1-Feb	1-Mar	1-Apr	1-May	1-Jun	1-Jul	1-Aug
	Chateaudun	0.007	0.004	0.004	0.003	0.002	0.003	0.006
	Hamburg	0.017	0.013	0.008	0.014	0.023	0.046	0.102
	Jokioinen	0.112	0.060	0.039	0.026	0.041	0.045	0.126
	Kremsmunster	0.024	0.008	0.007	0.007	0.005	0.009	0.016
	Okehampton	0.060	0.030	0.008	0.008	0.013	0.013	0.020
	Piacenza	0.039	0.018	0.008	0.003	0.001	0.001	0.008
	Porto	0.063	0.006	0.002	0.001	<0.001	0.001	0.002
	Sevilla	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

	Scenario	**Parent (µg/L)**						
FOCUS PELMO/ grassland		1-Feb	1-Mar	1-Apr	1-May	1-Jun	1-Jul	1-Aug
	Chateaudun	0.004	0.001	0.001	0.002	0.002	0.003	0.005
	Hamburg	0.067	0.030	0.008	0.003	0.006	0.016	0.027
	Jokioinen	0.339	0.244	0.068	0.024	0.034	0.034	0.112
	Kremsmunster	0.030	0.009	0.008	0.007	0.005	0.013	0.019
	Okehampton	0.091	0.055	0.012	0.014	0.017	0.017	0.014
	Piacenza	0.156	0.105	0.063	0.018	0.005	0.003	0.013
	Porto	0.214	0.043	0.015	0.003	0.001	0.001	0.003
	Sevilla	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Thiva	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001

	Scenario	**Parent (µg/L)**						
FOCUS MACRO/ grassland		1-Feb	1-Mar	1-Apr	1-May	1-Jun	1-Jul	1-Aug
	Chateaudun	0.007	0.001	<0.001	<0.001	<0.001	0.001	0.004

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Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 4 Environmental fate and behaviour

PEC(gw) - FOCUS modelling results (80th percentile annual average concentration at 1m) following annual application to winter cereals 1 x 120 g clopyralid/ha. PUF = 0.5

	Scenario	**Parent (µg/L)**				
		1-Feb	1-Mar	1-Apr	1-May	1-Jun
FOCUS PEARL/ grassland	Chateaudun	0.006	0.003	0.003	0.003	0.001
	Hamburg	0.014	0.007	0.004	0.007	0.012
	Jokioinen	0.047	0.030	0.018	0.015	0.021
	Kremsmunster	0.020	0.006	0.005	0.005	0.004
	Okehampton	0.054	0.025	0.007	0.005	0.010
	Piacenza	0.034	0.015	0.006	0.002	<0.001
	Porto	0.061	0.005	0.001	<0.001	<0.001
	Sevilla	0.003	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001	<0.001

	Scenario	**Parent (µg/L)**				
		1-Feb	1-Mar	1-Apr	1-May	1-Jun
FOCUS PELMO/ grassland	Chateaudun	0.004	0.001	0.001	0.001	0.001
	Hamburg	0.058	0.015	0.004	0.001	0.003
	Jokioinen	0.249	0.169	0.032	0.011	0.017
	Kremsmunster	0.024	0.005	0.005	0.005	0.003
	Okehampton	0.081	0.046	0.007	0.008	0.010
	Piacenza	0.126	0.090	0.050	0.014	0.004
	Porto	0.193	0.034	0.012	0.002	<0.001
	Sevilla	0.003	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001	<0.001

	Scenario	**Parent (µg/L)**				
		1-Feb	1-Mar	1-Apr	1-May	1-Jun
FOCUS MACRO/	Chateaudun	0.007	0.001	<0.001	<0.001	<0.001

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Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 4 Environmental fate and behaviour

PEC$_{(gw)}$ From lysimeter studies (4 studies in DE)

Parent (µg/L)	1st year	2nd year	3rd year
1) Annual average	<0.050	<0.055	0.001 – 0.019
2) Annual average	0.127	0.064 – 0.078 (over 2 years)	
3) Annual average	0.010	0.002	
4) Occasionally	up to 0.135		

Metabolite X	1st year	2nd year	3rd year
Annual average (µg/L)	-	-	-

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Rapporteur Member State	Month and year	Active substance
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PEC surface water and PEC sediment (Regulation (EU) N° 284/2013, Annex Part A, points 9.2.5 / 9.3.1)

Parent	(Robinson 2016)
Parameters used in FOCUSsw step 1 and 2	Version control no. of FOCUS calculator: FOCUS STEPS 1-2 v. 3.2 Molecular weight (g/mol): 191.96 K_{FOC} (mL/g): 1.41 (geometric mean, n = 9) DT_{50} soil (d): 18.4 d, lab (geometric mean, n = 10) DT_{50} water/sediment system (d): 1000 d (conservative FOCUS default) DT_{50} water (d): 1000 d DT_{50} sediment (d): 1000 d Crop interception (%): 0 % (minimal crop cover, winter cereals), 75% (full canopy, grassland)
Parameters used in FOCUSsw step 3 (if performed)	Version control no.'s of FOCUS software: FOCUS SWASH v.5.3 (FOCUS MACRO v. 5.5.4, FOCUS PRZM v. 4.3.1, FOCUS TOXSWA v. 4.4.3) Water solubility (mg/L): 1.43×10^5 Vapour pressure: 1.36×10^{-3} Pa at 20°C K_{FOC} (mL/g): 1.41 (geometric mean, n = 9) 1/n: 0.836 (arithmetic mean, n = 9) Q10=2.58 Plant Uptake Factor: 0 / 0.5
Application rate	Crop and growth stage: winter cereals BBCH 13, established grassland Number of applications: 1 Interval (d): - Application rate(s): 80 g a.s./ha (winter cereals), 120 g a.s./ha (grassland) Application window: 30 days; start of application window: 1st of each month (Feb – Jun for winter cereals, Feb –Aug for grassland)

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Finland	**May 2017**	**Clopyralid**

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FOCUS STEP 1 Scenario	**Day after overall maximum**	**PECSW (µg/L)**	**PECSED (µg/kg)**
		Actual	**Actual**
Winter cereals	**0 h**	**27.4**	**0.385**
Grassland	**0 h**	**41.0**	**0.578**

FOCUS STEP 2 Scenario	Day after overall maximum	PEC_{SW} (µg/L)	PEC_{SED} (µg/kg)
		Actual	Actual
Northern EU / Winter cereals			
Oct - Feb	0 h	12.2	0.172
Mar - May	0 h	5.31	0.075
Jun - Sep	0 h	5.31	0.075
Southern EU / Winter cereals			
Oct - Feb	0 h	9.89	0.139
Mar - May	0 h	9.89	0.139
Jun - Sep	0 h	7.60	0.107

FOCUS STEP 2 Scenario	Day after overall maximum	PEC_{SW} (µg/L)	PEC_{SED} (µg/kg)
		Actual	Actual
Northern EU / Grassland			
Oct - Feb	0 h	5.39	0.076
Mar - May	0 h	2.82	0.040
Jun - Sep	0 h	2.82	0.040
Southern EU / Grassland			
Oct - Feb	0 h	4.53	0.064
Mar - May	0 h	4.53	0.064
Jun - Sep	0 h	3.67	0.052

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Finland	**May 2017**	**Clopyralid**

Section 4 Environmental fate and behaviour

FOCUS STEP 3 / Winter cereals - PUF = 0

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Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 4 Environmental fate and behaviour

Appl. period	Scenario	Water body	PEC_{SW} (µg/L)	PEC_{SED} (µg/kg)	Main entry route
February	D1	d	7.78	2.28	Drainage
	D1	s	4.98	1.39	Drainage
	D2	d	10.4	1.70	Drainage
	D2	s	6.96	0.928	Drainage
	D3	d	0.699	0.262	Drift
	D4	p	0.405	0.306	Drainage
	D4	s	0.517	0.122	Drift
	D5	p	0.504	0.324	Drainage
	D5	s	2.74	0.173	Drainage
	D6	d	0.522	0.034	Drift
	R1	p	0.022	0.012	Runoff
	R1	s	0.968	0.048	Runoff
	R3	s	1.17	0.067	Runoff
	R4	s	0.336	0.012	Drift
March	D1	d	10.23	2.83	Drainage
	D1	s	6.45	1.75	Drainage
	D2	d	9.01	1.74	Drainage
	D2	s	5.65	1.06	Drainage
	D3	d	0.707	0.222	Drift
	D4	p	0.394	0.298	Drainage
	D4	s	0.514	0.119	Drift
	D5	p	0.064	0.053	Drift
	D5	s	0.419	0.019	Drift
	D6	d	0.563	0.067	Drift
	R1	p	0.042	0.022	Runoff
	R1	s	1.17	0.073	Runoff
	R3	s	3.30	0.213	Runoff
	R4	s	0.334	0.011	Drift
April	D1	d	12.1	2.94	Drainage
	D1	s	7.60	1.59	Drainage
	D2	d	11.2	1.86	Drainage
	D2	s	7.47	1.07	Drainage
	D3	d	0.699	0.172	Drift
	D4	p	0.338	0.267	Drainage
	D4	s	0.518	0.103	Drift
	D5	p	0.072	0.053	Drift
	D5	s	0.423	0.021	Drift
	D6	d	0.514	0.064	Drift
	R1	p	0.021	0.013	Runoff
	R1	s	0.769	0.044	Runoff
	R3	s	0.932	0.082	Runoff
	R4	s	1.48	0.104	Runoff
May	D1	d	1.11	0.525	Drainage
	D1	s	1.03	0.230	Drainage

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Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 4 Environmental fate and behaviour

Appl. period	Scenario	Water body	PEC_{SW} (µg/L)	PEC_{SED} (µg/kg)	Main entry route
	D2	d	19.5	2.01	Drainage
	D2	s	12.3	1.16	Drainage
	D3	d	0.763	0.226	Drift
	D4	p	0.356	0.277	Drainage
	D4	s	0.508	0.105	Drift
	D5	p	0.070	0.051	Drift
	D5	s	0.473	0.032	Drift
	D6	d	0.512	0.105	Drift
	R1	p	0.025	0.014	Runoff
	R1	s	0.985	0.057	Runoff
	R3	s	3.33	0.198	Runoff
	R4	s	2.37	0.165	Runoff
June	D1	d	0.647	0.327	Drift
	D1	s	0.449	0.149	Drift
	D2	d	7.55	2.79	Drainage
	D2	s	8.23	1.60	Drainage
	D3	d	0.866	0.328	Drift
	D4	p	0.407	0.321	Drainage
	D4	s	0.525	0.122	Drift
	D5	p	0.164	0.123	Drainage
	D5	s	0.473	0.048	Drift
	D6	d	0.512	0.105	Drift
	R1	p	0.089	0.043	Runoff
	R1	s	0.563	0.048	Runoff
	R3	s	1.36	0.122	Runoff
	R4	s	0.336	0.012	Drift

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Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 4 Environmental fate and behaviour

FOCUS STEP 3 / Winter cereals - PUF = 0.5

Appl. period	Scenario	Water body	PEC_{SW} (µg/L)	PEC_{SED} (µg/kg)	Main entry route
February	D1	d	7.69	2.22	Drainage
	D1	s	4.92	1.36	Drainage
	D2	d	9.91	1.60	Drainage
	D2	s	6.65	0.867	Drainage
	D3	d	0.639	0.217	Drift
	D4	p	0.239	0.181	Drainage
	D4	s	0.456	0.073	Drift
	D5	p	0.483	0.310	Drainage
	D5	s	2.71	0.167	Drainage
	D6	d	0.520	0.034	Drift
	R1	p	0.022	0.012	Runoff
	R1	s	0.932	0.047	Runoff
	R3	s	1.12	0.065	Runoff
	R4	s	0.336	0.012	Drift
March	D1	d	10.2	2.77	Drainage
	D1	s	6.40	1.71	Drainage
	D2	d	8.82	1.69	Drainage
	D2	s	5.53	1.03	Drainage
	D3	d	0.629	0.162	Drift
	D4	p	0.225	0.170	Drainage
	D4	s	0.454	0.068	Drift
	D5	p	0.044	0.034	Drift
	D5	s	0.411	0.014	Drift
	D6	d	0.562	0.066	Drift
	R1	p	0.040	0.021	Runoff
	R1	s	1.10	0.068	Runoff
	R3	s	3.28	0.212	Runoff
	R4	s	0.334	0.011	Drift

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Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

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April	D1	d	11.7	2.78	Drainage
	D1	s	7.34	1.51	Drainage
	D2	d	11.0	1.80	Drainage
	D2	s	7.30	1.03	Drainage
	D3	d	0.618	0.115	Drift
	D4	p	0.164	0.133	Drainage
	D4	s	0.448	0.053	Drift
	D5	p	0.049	0.034	Drift
	D5	s	0.415	0.015	Drift
	D6	d	0.514	0.063	Drift
	R1	p	0.021	0.013	Runoff
	R1	s	0.736	0.043	Runoff
	R3	s	0.877	0.078	Runoff
	R4	s	1.37	0.097	Runoff
May	D1	d	1.05	0.483	Drainage
	D1	s	0.977	0.208	Drainage
	D2	d	19.0	1.94	Drainage
	D2	s	11.9	1.12	Drainage
	D3	d	0.657	0.149	Drift
	D4	p	0.204	0.159	Drainage
	D4	s	0.467	0.060	Drift
	D5	p	0.051	0.037	Drift
	D5	s	0.473	0.029	Drift
	D6	d	0.512	0.105	Drift
	R1	p	0.025	0.014	Runoff
	R1	s	0.959	0.055	Runoff
	R3	s	3.31	0.198	Runoff
	R4	s	2.33	0.162	Runoff
June	D1	d	0.626	0.305	Drift
	D1	s	0.449	0.121	Drift
	D2	d	7.33	2.71	Drainage
	D2	s	7.99	1.55	Drainage
	D3	d	0.717	0.209	Drift
	D4	p	0.262	0.211	Drainage
	D4	s	0.490	0.083	Drift
	D5	p	0.142	0.107	Drainage
	D5	s	0.473	0.042	Drift
	D6	d	0.512	0.105	Drift
	R1	p	0.086	0.042	Runoff
	R1	s	0.541	0.046	Runoff
	R3	s	1.36	0.122	Runoff
	R4	s	0.336	0.012	Drift

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Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 4 Environmental fate and behaviour

FOCUS STEP 3 / Grassland - PUF = 0

Appl. period	Scenario	Water body	PEC_{SW} (µg/L)	PEC_{SED} (µg/kg)	Main entry route
February	D1	d	25.9	7.92	Drainage
	D1	s	18.5	4.67	Drainage
	D2	d	30.5	8.24	Drainage
	D2	s	24.8	3.70	Drainage
	D3	d	0.899	0.134	Drift
	D4	p	0.149	0.118	Drainage
	D4	s	0.667	0.089	Drift
	D5	p	1.17	0.717	Drainage
	D5	s	6.76	0.441	Drainage
	R2	s	0.640	0.026	Drift
	R3	s	0.709	0.033	Drift
March	D1	d	31.0	6.79	Drainage
	D1	s	19.4	4.20	Drainage
	D2	d	35.2	5.02	Drainage
	D2	s	25.7	2.68	Drainage
	D3	d	0.948	0.169	Drift
	D4	p	0.141	0.108	Drainage
	D4	s	0.659	0.088	Drift
	D5	p	0.093	0.064	Drift
	D5	s	0.650	0.031	Drift
	R2	s	0.662	0.014	Drift
	R3	s	0.705	0.029	Drift
April	D1	d	26.7	6.20	Drainage
	D1	s	16.8	3.35	Drainage
	D2	d	30.5	6.67	Drainage
	D2	s	26.1	3.53	Drainage
	D3	d	0.959	0.196	Drift
	D4	p	0.117	0.091	Drift
	D4	s	0.658	0.063	Drift
	D5	p	0.128	0.088	Drift
	D5	s	0.665	0.040	Drift
	R2	s	0.663	0.014	Drift
	R3	s	1.36	0.122	Runoff

May	D1	d	0.916	0.401	Drift
	D1	s	0.673	0.137	Drift
	D2	d	50.3	6.18	Drainage
	D2	s	33.6	3.68	Drainage
	D3	d	1.16	0.347	Drift
	D4	p	0.121	0.099	Drift
	D4	s	0.669	0.070	Drift
	D5	p	0.140	0.105	Drift
	D5	s	0.710	0.049	Drift
	R2	s	0.674	0.017	Drift
	R3	s	0.709	0.032	Drift
June	D1	d	0.830	0.430	Drift
	D1	s	0.673	0.201	Drift
	D2	d	0.867	0.452	Drift
	D2	s	0.778	0.336	Drift
	D3	d	1.49	0.645	Drift
	D4	p	0.287	0.220	Drift
	D4	s	0.682	0.158	Drift
	D5	p	0.416	0.286	Drainage
	D5	s	0.710	0.122	Drift
	R2	s	0.674	0.050	Drift
	R3	s	2.25	0.202	Runoff
July	D1	d	0.803	0.363	Drift
	D1	s	0.673	0.162	Drift
	D2	d	0.925	0.530	Drift
	D2	s	0.773	0.372	Drift
	D3	d	2.16	1.13	Drift
	D4	p	0.381	0.307	Drainage
	D4	s	0.658	0.215	Drift
	D5	p	0.308	0.245	Drainage
	D5	s	0.710	0.066	Drift
	R2	s	0.674	0.017	Drift
	R3	s	0.709	0.053	Drift
August	D1	d	0.784	0.401	Drift
	D1	s	0.673	0.214	Drift
	D2	d	2.95	1.34	Drainage
	D2	s	4.80	1.64	Drainage
	D3	d	2.57	1.66	Drift
	D4	p	0.712	0.550	Drainage
	D4	s	0.888	0.393	Drift
	D5	p	0.924	0.603	Drainage
	D5	s	0.710	0.243	Drift
	R2	s	0.674	0.017	Drift
	R3	s	0.709	0.057	Drift

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Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 4 Environmental fate and behaviour

FOCUS STEP 3 / Grassland - PUF = 0.5

Appl. period	Scenario	Water body	PEC_{SW} (µg/L)	PEC_{SED} (µg/kg)	Main entry route
February	D1	d	25.9	7.90	Drainage
	D1	s	18.4	4.66	Drainage
	D2	d	30.4	8.22	Drainage
	D2	s	24.7	3.69	Drainage
	D3	d	0.796	0.067	Drift
	D4	p	0.058	0.048	Drainage
	D4	s	0.623	0.036	Drift
	D5	p	1.16	0.711	Drainage
	D5	s	6.75	0.438	Drainage
	R2	s	0.640	0.026	Drift
	R3	s	0.709	0.033	Drift
March	D1	d	30.9	6.73	Drainage
	D1	s	19.3	4.16	Drainage
	D2	d	35.1	4.99	Drainage
	D2	s	25.7	2.65	Drainage
	D3	d	0.808	0.083	Drift
	D4	p	0.056	0.044	Drainage
	D4	s	0.625	0.036	Drift
	D5	p	0.053	0.035	Drift
	D5	s	0.633	0.019	Drift
	R2	s	0.662	0.014	Drift
	R3	s	0.705	0.029	Drift
April	D1	d	26.5	6.12	Drainage
	D1	s	16.7	3.30	Drainage
	D2	d	30.2	6.64	Drainage
	D2	s	26.0	3.51	Drainage
	D3	d	0.809	0.094	Drift
	D4	p	0.046	0.030	Drift
	D4	s	0.602	0.023	Drift
	D5	p	0.069	0.047	Drift
	D5	s	0.644	0.024	Drift
	R2	s	0.663	0.014	Drift
	R3	s	1.27	0.113	Runoff

May	D1	d	0.881	0.376	Drift
	D1	s	0.673	0.104	Drift
	D2	d	50.2	6.10	Drainage
	D2	s	33.5	3.64	Drainage
	D3	d	0.885	0.156	Drift
	D4	p	0.048	0.035	Drift
	D4	s	0.657	0.034	Drift
	D5	p	0.079	0.056	Drift
	D5	s	0.710	0.041	Drift
	R2	s	0.674	0.017	Drift
	R3	s	0.709	0.032	Drift
June	D1	d	0.814	0.362	Drift
	D1	s	0.673	0.150	Drift
	D2	d	0.854	0.442	Drift
	D2	s	0.767	0.328	Drift
	D3	d	1.12	0.348	Drift
	D4	p	0.104	0.073	Drift
	D4	s	0.662	0.053	Drift
	D5	p	0.299	0.212	Drainage
	D5	s	0.710	0.089	Drift
	R2	s	0.674	0.047	Drift
	R3	s	2.23	0.201	Runoff
July	D1	d	0.795	0.346	Drift
	D1	s	0.673	0.121	Drift
	D2	d	0.843	0.460	Drift
	D2	s	0.736	0.317	Drift
	D3	d	1.69	0.786	Drift
	D4	p	0.154	0.130	Drainage
	D4	s	0.658	0.088	Drift
	D5	p	0.195	0.160	Drainage
	D5	s	0.710	0.044	Drift
	R2	s	0.674	0.017	Drift
	R3	s	0.709	0.051	Drift
August	D1	d	0.781	0.344	Drift
	D1	s	0.673	0.167	Drift
	D2	d	2.76	1.25	Drainage
	D2	s	4.42	1.52	Drainage
	D3	d	2.11	1.27	Drift
	D4	p	0.392	0.313	Drainage
	D4	s	0.658	0.219	Drift
	D5	p	0.818	0.535	Drainage
	D5	s	0.710	0.217	Drift
	R2	s	0.674	0.017	Drift
	R3	s	0.709	0.055	Drift

List of Endpoints

Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 4 Environmental fate and behaviour

Metabolite: Not relevant, as no metabolites identified Parameters used in FOCUSsw step 1 and 2	Molecular weight: Soil or water metabolite: Koc/Kom (mL/g): DT_{50} soil (d): *x days (If necessary, Lab or field. In accordance with FOCUS SFO)* DT_{50} water/sediment system (d): *x d (representative worst case from sediment water studies)* DT_{50} water (d): DT_{50} sediment (d): Crop interception (%):*e.g. X % (no, minimal, average or full canopy)* Maximum occurrence observed (% molar basis with respect to the parent) Total Water and Sediment: Soil: *(if necessary)*
Parameters used in FOCUSsw step 3 (if performed)	Water solubility (mg/L): Vapour pressure: *X* Pa at 20°C Kom/Koc (mL/g): 1/n: (Freundlich exponent general or for soil, susp. solids or sediment respectively) Q10=2.58, Walker equation coefficient 0.7 Crop uptake factor: Metabolite kinetically generated in simulation (yes/no): Formation fraction in soil (k_f/k_{dp}): *(If formation / degradation of metabolite is kinetically simulated by PRZM and MACRO) the identity of the precursor should also be included (e.g. from parent).* Formation fraction in sediment water (k_f/k_{dp}): *(If formation / degradation of metabolite is kinetically simulated by TOXSWA) the identity of the precursor should also be included (e.g. from parent).*
Application rate	Crop and growth stage: *wheat BBCH X-X* Number of applications: *x* Interval (d): *x* Application rate(s): *x* g a.s./ha Application window: *early or late spray drift selected (for vines and top fruit)*
Main routes of entry	

List of Endpoints

Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 4 Environmental fate and behaviour

Estimation of concentrations from other routes of exposure (Regulation (EU) N° 284/2013, Annex Part A, point 9.4)

Method of calculation	Not required

PEC

Maximum concentration	Not required

Section 5 Ecotoxicology

Effects on birds and other terrestrial vertebrates (Regulation (EU) N° 283/2013, Annex Part A, point 8.1 and Regulation (EU) N° 284/2013, Annex Part A, point 10.1)

Species	Test substance	Time scale	End point	Toxicity (mg/kg bw per day)
Birds				
Mallard duck *(Anas platyrhynchos)* ([redacted] 1989)	Clopyralid	Acute	LD_{50}	1465
Mallard duck *(Anas platyrhynchos)* ([redacted] 1985)	Clopyralid	Long-term	NOEC	118
Bobwhite quail (*Colinus virginianus*) [redacted] 2005	GF-1374	Acute	LD_{50}	> 2250
Mammals				
Rat ([redacted] & al. 1987)	Clopyralid	Acute	LD_{50}	> 5000
Rat ([redacted] 2005)	GF-1374	Acute	LD_{50}	3378
Rat ([redacted] & al. 1977-78)	Clopyralid	Long-term	NOAEL	50

List of Endpoints

Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 5 Ecotoxicology

Endocrine disrupting properties (Annex Part A, points 8.1.5)

Clopyralid has undergone a comprehensive battery of in vivo toxicology cover a broad spectrum of endocrine endpoints. This testing covered a tiered battery of acute, sub-chronic, chronic and reproductive tests. Furthermore, these studies have robust experimental designs, follow internationally accepted protocols and have a high level of replication and a long history of use in hazard identification and risk assessment. The results from these studies indicate no evidence of endocrine-mediated effects by clopyralid.

In addition to in vivo studies, clopyralid is included in the U.S. Endocrine Disruption Screening program. In vitro study results for endocrine endpoints are summarized in the EDSP21 Dashboard (http://actor.epa.gov/edsp21/). Specifically, various in vitro assays were conducted for its estrogenic, androgenic, and thyroid activities. Clopyralid does not show any bioactivity in estrogen receptor (ER)-, androgen receptor (AR)-, or thyroid receptor (ThR)-related assays. Clopyralid (cytotoxic limit = 161.9274 µM) was negative in 14/15 ER assays (not tested in 3 assays). Although it was positive in one ER assay Tox21_ERa_LUC_BG1_Agonist with an AC50 of 46.3512 µM, this is likely a non-specific outcome, because only one ER assay was positive. Clopyralid also was negative in 8/8 AR assays (not tested in 3 assays), and negative in 3/3 TR assays (not tested in 1 assay). ToxCast Model Predictions for bioactivity for clopyralid were 0 for all measures including ER agonist and antagonist AUCs and AR agonist and antagonist AUCs (all equaled 0).
Studies specific to evaluating endocrine disruption in terrestrial vertebrate species were not conducted. However, chronic reproductive studies with the avian species, northern bobwhite quail, demonstrated no effects on the reproductive performance at any test concentrations. Since no reproductive effects were observed, it is unlikely that clopyralid is inducing an endocrine effect in the bobwhite quail. This finding is consistent with what was documented in mammalian species where clopyralid did not directly impact the endocrine system (estrogen receptor, androgen receptor, etc.) of vertebrate species.

Overall, robust and consistent in vivo and in vitro data provides no evidence of endocrine disrupting properties of clopyralid so further ecotoxicological studies with reptiles and amphibians were not conducted.

Additional higher tier studies (Annex Part A, points 10.1.1.2):

Higher tier studies were not required

Terrestrial vertebrate wildlife (birds, mammals, reptile and amphibians) (Annex Part A, points 8.1.4, 10.1.3):

No further study with vertebrate wildlife necessary since low risk to birds and mammals was demonstrated. Additional data was not submitted

List of Endpoints

Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 5 Ecotoxicology

Toxicity/exposure ratios for terrestrial vertebrates (Regulation (EU) N° 284/2013, Part A, Annex point 10.1)

GF-1374 at 1.5 L formulated product/ha x 1 applications to grassland and 1.0 L product to cereals

Compound	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
Clopyralid	Large herbivorous	Acute	3.66	400	10
GF-1374	Large herbivourous	Acute	47.6	36.9	10
Clopyralid	Small omnivorous	Acute	12.7	115	10
GF-1374	Small omnivorous	Acute	165	10.6	10
Clopyralid	Large herbivorous	Long-term	1.03	115	5
Clopyralid	Small granivorous	Long-term	2.75	42.9	5
Tier 1 (Birds) *Tier 1 assessment not necessary due to all relevant scenarios passing the screening step*					
Screening Step (Mammals)					
Clopyralid	Small herbivorous	Acute	9.47	528	10
GF-1374	Small herbivorous	Acute	123	20.8	10
Clopyralid	Small herbivorous	Acute	16.4	305	10
GF-1374	Small herbivorous	Acute	213	12.0	10
Clopyralid	Small herbivorous	Long-term	2.05	24.4	5
Clopyralid	Small herbivorous	Long-term	4.60	10.9	5

Risk from bioaccumulation and food chain behaviour:
Not relevant, as clopyralid is not expected to bioaccumulate in animal tissues as indicated by a log P_{ow} of -2.63 and a fish BCF < 1.

Risk from consumption of contaminated water:
The K_{oc} for clopyralid is 1.41, so the approach above for less sorptive substances can be applied to this active substance. The maximum application rate for clopyralid is 120 g/ha and the relevant endpoint for the avian risk assessment is the reproduction NOEL of 118 mg/kg bw/d. The ratio of these figures is 1.02, which is lower than 50, so a formal assessment of the risk to birds from exposure to clopyralid through drinking water is not necessary

List of Endpoints

Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 5 Ecotoxicology

Toxicity data for all aquatic tested species (Regulation (EU) N° 283/2013, Annex Part A, points 8.2 and Regulation (EU) N° 284/2013 Annex Part A, point 10.2)*

* This section does not yet reflect the new EFSA Guidance Document on aquatic organisms which has been noted in the meeting of the Standing Committee on Plants, Animals, Food and Feed on 11 July 2014.

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
Laboratory tests				
Fish				
Oncorhynchus mykiss ([redacted] & al. 2000a)	Clopyralid	96 hr	Mortality, LC_{50}	> 99.9 mg a.s./L (mm)
Oncorhynchus mykiss ([redacted] 2005a)	GF-1374	96 hr	Mortality, LC_{50}	7.1 mg a.s./L (nom.)
Pimephales promelas ([redacted] & al. 2000b)	Clopyralid	ELS	NOEC	10.8 mg a.s./L (mm)
Aquatic invertebrates				
Daphnia magna (Marino & al. 2000c)	Clopyralid	48 h	Mortality, EC_{50}	> 99.0 mg a.s./L (mm)
Daphnia magna (Sayers 2005b)	GF-1374	48 h	Mortality, EC_{50}	6.9 mg a.s./L (nom.)
Daphnia magna (Douglas & al. 1992)	Clopyralid	21 d	NOEC	17 mg a.s./L (mm)
Sediment-dwelling organisms				
Chironomus riparius (Barrett 2001)	Clopyralid	28 d (static)	NOEC	50 mg a.s./L (mm)
Algae				
Selenastrum capricornutum (Kirk & al. 2000)	Clopyralid	72 h	Growth rate: E_rC_{50}	30 mg a.s./L (mm)
Navicula pelliculosa (Aufderheide 2014)	Clopyralid	72 h	Growth rate: E_rC_{50}	31.3 mg a.s./L (mm)
Pseudokirchneriella subcapitata (Hoberg 2005a)	GF-1374	72 h	Yield: E_yC_{50}	1.1 mg product/L (nom.)
Navicula pelliculosa (Hoberg 2005b)	GF-1374	72 h	Biomass: E_bC_{50}	1.4 mg product/L (nom.)

List of Endpoints

Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 5 Ecotoxicology

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]
Higher plant				
Lemna gibba (Cowgill & al. 1990)	Clopyralid	14 day	EC_{50}	89 mg a.s./L (mm)
Myriophyllum spicatum (Banman & Moore 2015)	Clopyralid	14 day	E_rC_{50}	> 3.0 mg a.s./L (mm)
Lemna gibba (Hoberg 2005c)	GF-1374	14 day	E_rC_{50}	0.42 mg product/L (nom.)
Myriophyllum spicatum (Gonsior 2013)	GF-1374	14 day	E_rC_{50}	0.44 mg product/L (nom.)
Further testing on aquatic organisms *Due to low acute and chronic risk to aquatic organisms demonstrated during the risk assessments, further data on aquatic organisms was deemed unnecessary and no further data has been presented.*				
Potential endocrine disrupting properties (Annex Part A, point 8.2.3) *Mammalian and other terrestrial studies indicate the clopyralid or its metabolites do not demonstrate any potential for endocrine disruption so further study was not required.*				

[1] ($_{nom}$) nominal concentration; ($_{mm}$) mean measured concentration; prep.: preparation; a.s.: active substance

Bioconcentration in fish (Annex Part A, point 8.2.2.3)

	Clopyralid
$logP_{OW}$	-2.63
Steady-state bioconcentration factor (BCF) (total wet weight/normalised to 5% lipid content)	Bluegill sunfish: BCF < 1.0 in 28 days (Bidlack 1982)
Annex VI Trigger for the bioconcentration factor	< 100
Clearance time (days) (CT_{50})	Not calculated
(CT_{90})	
Level and nature of residues (%) in organisms after the 14 day depuration phase	negligible
Higher tier study: Not required	

List of Endpoints

Rapporteur Member State	Month and year	Active substance
Finland	May 2017	Clopyralid

Section 5 Ecotoxicology

Minimum TERs for the most sensitive aquatic species after applications of GF-1374 to pasture and cereals at rates of 1.5 L GF-1374/ha and 1.0 L GF-1374/ha, respectively

Substance	Time frame	Critical Endpoint (µg/L)	Distance from treated area	PECsw (µg/L)	RAC	TER[a]	TER trigger
Fish							
Clopyralid	Acute	99900	Step 1 broadcast application Grassland	41.0	999	24.4	1
Clopyralid	Acute	99900	Step 1 broadcast application Cereals	27.4	999	36.5	1
GF-1374	Acute	7100 (measured)	Spray drift 1 m buffer 0% drift reduce nozzle	14.4	71	4.93	1
GF-1374	Acute	2900 (predicted by mixture toxicity)	Spray drift 1 m buffer 0% drift reduce nozzle	14.4	29	2.01	1
Clopyralid	Chronic	10800	Step 1 broadcast application Grassland	41.0	1080	26.3	1
Clopyralid	Chronic	10800	Step 1 broadcast application Cereals	27.4	1080	39.4	1
Invertebrates							
Clopyralid	Acute	> 99000	Step 1 broadcast application Grassland	41.0	990	24.1	1
	Acute		Step 1 broadcast application Cereal	27.4		36.1	1
GF-1374	Acute	6900 (measured)	Spray drift 1 m buffer 0% drift reduce nozzle	14.4	69	4.79	1
GF-1374	Acute	3500 (predicted by mixture toxicity)	Spray drift 1 m buffer 0% drift reduce nozzle	14.4	35	2.43	1
Clopyralid	Chronic	17000	Step 1 broadcast application Grassland	41.0	170	41.5	1
Clopyralid	Chronic	17000	Step 1 broadcast application Cereal	27.4	170	62.0	1

Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 5 Ecotoxicology

Invertebrates (Chironomus riparius)							
Clopyralid	Chronic	50000	Step 1 broadcast application Grassland	41.0	5000	122	1
	Chronic		Step 1 broadcast application Cereal	27.4		182	1
Green Algae							
Clopyralid *(S. capricornutum)*		30000	Step 1 broadcast application grassland	41.0	3000	73.2	1
			Step 1 broadcast application cereals	27.4		109	1
GF-1374 *(P. subcapitata)*		1100	Spray drift 1 m buffer zone 0% drift reduce nozzle	14.4	110	7.64	1
Diatoms							
Clopyralid *(Navicula pelliculosa)*		31300	Step 1 broadcast application grassland	41.0	3130	76.3	1
			Step 1 broadcast application cereals	27.4		114	1
GF-1374 *(Navicula pelliculosa)*		1400	Spray drift 1 m buffer zone 0% drift reduce nozzle	14.4	140	9.72	1
Macrophytes (Lemna gibba)							
Clopyralid		89000	Step 1 broadcast application grassland	41.0	8900	217	1
			Step 1 broadcast application cereals	27.4		325	1
GF-1374		420	Spray drift 1 m buffer zone 0% drift reduce nozzle	14.4	42	2.92	1
Macrophytes (Myriophyllum spicatum)							
Clopyralid		3000	Step 1 broadcast application grassland	41.0	300	7.32	1
			Step 1 broadcast application cereals	27.4		10.9	1
GF-1374		440	Spray drift 1 m	14.4	44	3.05	1

		buffer zone 0% drift reduce nozzle				
[a]Relevant acute or long term TER value compared to the trigger value of 1						

List of Endpoints

Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 5 Ecotoxicology

Effects on bees (Regulation (EU) N° 283/2013, Annex Part A, point 8.3.1 and Regulation (EU) N° 284/2013 Annex Part A, point 10.3.1)*

* This section does reflect the new EFSA Guidance Document on bees which has not yet been noted by the Standing Committee on Plants, Animals, Food and Feed.

Species	Test substance	Time scale/type of endpoint	End point	toxicity
Apis mellifera (Wainwright 2001a)	Clopyralid	Acute	Oral toxicity (LD_{50})	> 100 µg/bee
Apis mellifera (Hughes 2004a)	GF-1374	Acute	Oral toxicity (LD_{50})	> 86.7 µg/bee
Apis mellifera (Wainwright 2001b)	Clopyralid	Acute	Contact toxicity (LD_{50})	> 98.1 µg/bee
Apis mellifera (Hughes 2004b)	GF-1374	Acute	Contact toxicity (LD_{50})	> 200 µg/bee

Potential for accumulative toxicity: *no*
Semi-field test (Cage and tunnel test) The acute toxicity of GF-1374 to honey bees is considered low based on the Q_{HO} and Q_{HC} values are below the Annex VI trigger of 50 (see above risk assessments). Consequently, the acute oral and contact risk to honeybees is low following applications of GF-1374 at rates of up to 1.5 L formulated product/ha to pasture and 1.0 product/ha for cereals. Based on predicted exposure and acute contact endpoints for both actives as well as the formulated product and from predicted exposure from visiting off field plants following applications of GF-1374 to grassland and cereals, low risk was demonstrated. Also, dietary risk from consumption of nectar and pollen for both adult and larvae is considered low based on predicted exposure and acute oral endpoints. Finally, no sublethal effects were reported in acute contact and oral studies for clopyralid suggesting sublethal effects should not be anticipated. Overall, semi field tests are not considered necessary and have not been performed.
Field tests The acute toxicity of GF-1374 to honey bees is considered low based on the Q_{HO} and Q_{HC} values are below the Annex VI trigger of 50 (see above risk assessments). Consequently, the acute oral and contact risk to honeybees is low following applications of GF-1374 at rates of up to 1.5 L formulated product/ha to pasture and 1.0 product/ha for cereals. Based on predicted exposure and acute contact endpoints for both actives as well as the formulated product and from predicted exposure from visiting off field plants following applications of GF-1374 to grassland and cereals, low risk was demonstrated. Also, dietary risk from consumption of nectar and pollen for both adult and larvae is considered low based on predicted exposure and acute oral endpoints. Finally, no sublethal effects were reported in acute contact and oral studies for clopyralid suggesting sublethal effects should not be anticipated. Overall, field tests are not considered necessary and have not been performed.

List of Endpoints

Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 5 Ecotoxicology

Risk assessment for GF-1374 applied once to grassland and cereals at 1.5 and 1.0 L product/ha, respectively

Species	Test substance	Risk quotient	HQ/TER	Trigger
Apis mellifera	Clopyralid (grassland) GF-1374 Clopyralid (cereals) GF-1374	HQ_{oral}	< 1.2 < 18 < 0.8 < 12	50
Apis mellifera	Clopyralid (grassland) GF-1374 Clopyralid (cereals) GF-1374	$HQ_{contact}$	< 1.2 < 7.8 < 0.82 < 5.2	50

List of Endpoints

Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 5 Ecotoxicology

Effects on other arthropod species (Regulation (EU) N° 283/2013, Annex Part A, point 8.3.2 and Regulation (EU) N° 284/2013 Annex Part A, point 10.3.2)

Laboratory tests with standard sensitive species

Species	Test Substance	End point	Toxicity
Typhlodromus pyri (Loose 2005)	GF-1374	Mortality, LR_{50}	2000 mL/ha
Aphidius rhopalosiphi (Loose 2004a)	GF-1374	Mortality, LR_{50}	2000 mL/ha
Additional species			
Chrysoperla carnea (Loose 2004b)	GF-1374	Mortality, LR_{50}	2000 mL/ha

First tier risk assessment for one application of GF-1374 at 1.5 L product/ha to grassland and 1.0 L product/ha cereals.

Test substance	Species	Effect (LR_{50} mL/ha)	HQ in-field	HQ off-field[1]	Trigger
GF-1374 (grassland)	*Typhlodromus pyri*	2000	< 0.78	< 0.01	2
	Aphidius rhopalosiphi	2000	< 0.78	< 0.01	
	Chrysoperla carnea	2000	< 0.78	< 0.01	
GF-1374 (cereals)	*Typhlodromus pyri*	2000	< 0.52	< 0.007	
	Aphidius rhopalosiphi	2000	< 0.52	< 0.007	
	Chrysoperla carnea	2000	< 0.52	< 0.007	

[1]calculated on the drift rate of 2.77%

Semi-field tests
No effects were observed following laboratory testing in accordance with the requirements put forth in point 8.3.2 of Part A of the Annex to Regulation (EU) no 283/2013 point 10.3.2 Annex Regulation (EU) 284/2013. Since Annex trigger values were not breached under these scenarios, semi field testing is not required.
Field studies
Part A of the Annex Regulation (EU) No 283/2013 or in accordance with points 10.3.2.2 or 10.3.2.3 of Annex Regulation (EU) 284/2013. Calculated Risk Quotients (RQs) did not indicate risk to non-target arthropods so field testing was not required.
Additional specific test
Not needed

List of Endpoints

Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 5 Ecotoxicology

Effects on non-target soil meso- and macro fauna; effects on soil nitrogen transformation (Regulation (EU) N° 283/2013, Annex Part A, points 8.4, 8.5, and Regulation (EU) N° 284/2013 Annex Part A, points 10.4, 10.5)

Test organism	Test substance	Application method of test a.s./ OM	Time scale	End point	Toxicity (mg a.s./kg sdw)
Earthworms					
Eisenia fetida (Hayward 2001)	Clopyralid	Overspray / 10% OM	Chronic	28 d NOEC	1.97
Eisenia fetida (Davies 2005)	GF-1374		Chronic	56 d NOEC	> 59.3
Other soil macroorganisms					
Folsomia candida (Ganssmann 2012a)	GF-1374	Overspray / 5% OM	Chronic	NOEC	> 50
Hypoaspis aculeifer (Ganssmann 2012a)	GF-1374		Chronic	NOEC	100

Higher tier testing (e.g. modelling or field studies)
Not available, not required

Toxicity/exposure ratios for soil organisms

GF-1374 at 2 L product/ha x 1 application

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
Earthworms					
E. fetida	Clopyralid (grassland)	Chronic	0.016	123	5
E. fetida	GF-1374 (grassland)	Chronic	2.08	14.3[2]	5
E. fetida	Clopyralid (cereals)	Chronic	0.107	18.4	5
E. fetida	GF-1374 (cereals)	Chronic	2.08	14.3[2]	5
Other soil macroorganisms					
F. candida	GF-1374	Chronic	2.08	12.0	5
H. aculeifer	GF-1374	Chronic	2.08	24.0	5

[1]Maximum PEC soil was used in the risk assessment

[2]Endpoint adjusted by a factor of 0.5 to allow for a high organic C content of soil

List of Endpoints

Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 5 Ecotoxicology

Test type	Test substance	Max PEC_{soil}[1]	Effects <25 % (mg/kg sdw)	TER
N transformation	Clopyralid (Schöbinger 2013)	0.107	209	1953
	GF-1374 (Rix 2005)	2.08	13.9	6.68
C transformation	Clopyralid (Schöbinger 2013)	0.107	209	1953
	GF-1374 (Rix 2005)	2.08	13.9	6.68

[1]Maximum PEC soil was used in the risk assessment

Effects on terrestrial non target higher plants (Regulation (EU) N° 283/2013, Annex Part A, point 8.6 and Regulation (EU) N° 284/2013 Annex Part A, point 10.6)

Screening data

Not required for herbicides or plant growth regulators as ER_{50} tests should be provided

Laboratory dose response tests

Species	Test substance	ER_{50} (mL product/ha) vegetative vigour	ER_{50} (mL product/ha) emergence	Exposure[1] (mL product/ha)	TER	Trigger
Lactuca sativa (Eley 2005a)	GF-1374	21	--	4.16 at 1 m 90% DRN	5.04	5
				2.14 5 m buffer with 75% DRN	9.81	
				10 m	**4.82**	
		11.5[2]		5 m 0% DRN	1.35	1
Lactuca sativa (Eley 2005b)	GF-1374	--	460	41.6 at 1 m with 0% DRN	11.1	5
Extended laboratory studies : Not necessary since low risk was demonstrated Semi-field and field test: Not necessary since low risk was demonstrated						

[1] exposure estimates have been estimated using application rate at the following % drift values (2.77% for 1m; 0.57% for 5 m; 0.29% for 10 m) assuming drift reducing nozzles (DRN)

[2]based on probabilistic assessment and 5th percentile

Effects on biological methods for sewage treatment (Regulation (EU) N° 283/2013, Annex Part A, point 8.8)

Test type/organism	Test substance	End point
Activated sludge	Clopyralid	3 h EC_{50} > 100 mg/L (Mallett 2000)
Pseudomonas sp		No data available, not required

List of Endpoints

Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 5 Ecotoxicology

Monitoring data (Regulation (EU) N° 283/2013, Annex Part A, point 8.9 and Regulation (EU) N° 284/2013, Annex Part A, point 10.8)

Available monitoring data concerning adverse effect of the a.s. Ecotoxicological monitoring data for the active substance clopyralid has not been submitted for review and not required.
Available monitoring data concerning effect of the PPP. Ecotoxicological monitoring data for the plant protection product GF-1374 has not been submitted for review and not required.

Definition of the residue for monitoring (Regulation (EU) N° 283/2013, Annex Part A, point 7.4.2)
Ecotoxicologically relevant compounds[1]

Compartment	
soil	Clopyralid
water	Clopyralid
sediment	Clopyralid
groundwater	Clopyralid

[1] metabolites are considered relevant when, based on the risk assessment, they pose a risk comparable or higher than the parent

Rapporteur Member State	Month and year	Active substance
Finland	**May 2017**	**Clopyralid**

Section 5 Ecotoxicology

Classification and labelling with regard to ecotoxicological data (Regulation (EU) N° 283/2013, Annex Part A, Section 10)

Substance	Clopyralid
Harmonised classification according to Regulation (EC) No 1272/2008 and its Adaptations to Technical Process [Table 3.1 of Annex VI of Regulation (EC) No 1272/2008 as amended][7]:	Hazard pictograms GHS09 (environmental hazard) Signal word: Danger (health hazard) ; environmental classification would trigger signal word "Warning", but only one signal word per classification is used and Danger takes precedence. Hazard statements: H410 (environmental hazard) Precautionary statements: P273 (environmental), P501 (environmental) Supplemental labelling: EUH401 (applies to all PPP products)
Peer review proposal[8] for harmonised classification according to Regulation (EC) No 1272/2008:	

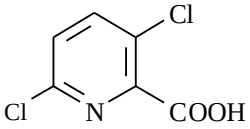
[7] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. OJ L 353, 31.12.2008, 1-1355.

[8] It should be noted that harmonised classification and labelling is formally proposed and decided in accordance with Regulation (EC) No 1272/2008. Proposals for classification made in the context of the evaluation procedure under Regulation (EC) No 1107/2009 are not formal proposals.

Rapporteur Member State	Month and year	Active substance
Finland	**May 2016**	**Clopyralid**

Appendix - Used compounds code(s)

Used compounds code(s)

Code/Trivial name*	IUPAC name/SMILES notation	Structural formula
Clopyralid	3,6-dichloropyridine-2-carboxylic acid	
GF-1374 Lot No. 187/76 A	The representative formulation of clopyralid: Emulsifiable concentrate (EC) containing clopyralid 80 g/L fluroxypyr 144 g/L florasulam 2.5 g/L.	

* The compound code / trivial name in bold is the name used in the list of endpoints.