Appendix to:

EFSA (European Food Safety Authority), 2017. Conclusion on the peer review of the pesticide risk assessment of the active substance chlorothalonil. EFSA Journal 2018;16(1):5126, 47 pp. doi:10.2903/j.efsa.2018.5126

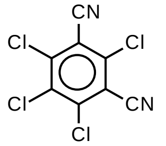
Appendix A – List of end points for the active substance and the representative formulation

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)	Chlorothalonil
Function (*e.g.* fungicide)	Fungicide

Rapporteur Member State	The Netherlands
Co-rapporteur Member State	Belgium

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

Chemical name (IUPAC)	tetrachloroisophthalonitrile
Chemical name (CA)	2,4,5,6-tetrachloro-1,3-benzenedicarbonitrile
CIPAC No	288
CAS No	1897-45-6
EC No (EINECS or ELINCS)	217-588-1 (EINECS)
FAO Specification (including year of publication)	2015 (288/TC, October 2015) Chlorothalonil 985 g/kg Hexachlorobenzene (HCB) 0.04 g/kg Decachlorobiphenyl (DCB) 0.03 g/kg
Minimum purity of the active substance as manufactured	985 g/kg
Identity of relevant impurities (of toxicological, ecotoxicological and/or environmental concern) in the active substance as manufactured	Hexachlorobenzene (HCB) 0.04 g/kg Decachlorobiphenyl (DCB) 0.03 g/kg Open
Molecular formula	$C_8Cl_4N_2$
Molar mass	265.9
Structural formula	

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

Melting point (state purity)	252 °C (99.6%)
Boiling point (state purity)	347 °C (99.5%)
Temperature of decomposition (state purity)	>347°C (boiling point, 99.5%).
Appearance (state purity)	Pure: white crystalline solid (99.6%) Techn.: white or tan powder (98.9%)
Vapour pressure (state temperature, state purity)	7.62 x 10^{-5} Pa at 25 °C
Henry's law constant (state temperature)	2.5 x 10^{-2} Pa m^3 mol^{-1} at 25 °C
Solubility in water (state temperature, state purity and pH)	pH (neutral): 0.81 mg/l at 25 °C (99.6%) No pH dependency is expected.
Solubility in organic solvents (state temperature, state purity)	In g/L at 25 °C (99.3%) acetone 18 dichloroethane 31 ethyl acetate 11 hexane 0.18 methanol 1.7 octanol 0.61 toluene 56
Surface tension (state concentration and temperature, state purity)	90% satured solution: 71.5 mN/m at 21.5 °C (99.8% pure)
Partition coefficient (state temperature, pH and purity)	Chlorothalonil at 25 °C and 99% pure Log Po/w = 2.94 No pH dependency expected Metabolite SDS-3701 (R182281) at 25 °C and 98.7% pure: Log P_{OW} = 0.97 at pH 3.4 (in pure water) Log P_{OW} = 0.84 at pH 5.0 (in buffer solution) Log P_{OW} = 0.61 at pH 6.8 (in buffer solution) Log P_{OW} = 0.58 at pH 9.0 (in buffer solution)
Dissociation constant (state purity)	Chlorothalonil does not dissociate within an environmentally relevant pH range
UV/VIS absorption (max.) incl. ε (state purity, pH)	UV maxima at 232, 312, 324 nm (ε 62390, 1116 resp. 1507 L.mol^{-1}.cm^{-1} in neutral solutions). Same maxima observed in acidified media. In alkaline media different maxima were observed due to degradation of the substance. Chlorothalonil shows significant absorpbtion at wavelengths > 290nm (99.84% pure)
Flammability (state purity)	Not flammable, self-heating or auto-flammable (99.15%)
Explosive properties (state purity)	Not explosive (99.15%)
Oxidising properties (state purity)	Not oxidising (98.9%)

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)	Product L/ha **a) max. rate per appl. b) max. total rate per crop/season** (l)	Water L/ha min-max	g a.s./ha **a) max. rate per appl. b) max. total rate per crop/season** (l)		
Wheat	EU	A14111 B	F	*Pyrenophora teres, Puccinia hordei, Rhynchosporium secalis,Gaeumanomyces graminis var tritici*	SC	Chlorothalonil 400 g/L + Azoxystrobin 80 g/L SC	Foliar	BBCH 30-69 Winter wheat: March-June Spring wheat: May-July	2	14 (2nd application not before BBCH 40)	a) 1.875 b) 3.75	100-400	a) CHLT: 750 ; AZT: 150 b) CHLT: 1500; AZT: 300	n.a.	No need to set PHI. See growth stage at last application
Barley	EU	A14111 B	F	*Pyrenophora teres, Puccinia hordei, Rhynchosporium secalis,Gaeumanomyces graminis var tritici*	SC	Chlorothalonil 400 g/L + Azoxystrobin 80 g/L SC	Foliar	BBCH 30-59 Winter barley: March-June Spring barley: May-July	2	14 (2nd application not before BBCH 40)	a) 1.875 b) 3.75	100-400	a) CHLT: 750 ; AZT: 150 b) CHLT: 1500; AZT: 300	n.a.	No need to set PHI. See growth stage at last application
Tomatoes	EU	A14111 B	F	*Phytophthora infestans, Alternaria sp.*	SC	Chlorothalonil 400 g/L + Azoxystrobin 80 g/L	Foliar	BBCH 51-89 From June up to PHI of 3 days	1	n.a.	a) 2.5	500-1500	a)=b) CHLT: 1000 AZT: 200	3	

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)	Product L/ha **a) max. rate per appl. b) max. total rate per crop/season** (l)	Water L/ha min-max	g a.s./ha **a) max. rate per appl. b) max. total rate per crop/season** (l)		
						SC									
Wheat	CEU SEU	ARY-0474-001	F	*Septoria sp.*	SC	Chloro thaloni l 500 g/L	Foliar	BBCH 30-69 Winter Wheat: March-June Spring Wheat: May-July	2	14 (2nd applicatio n not before BBCH 40)	a) 1.5 b) 3.0	100-400	a) 750 b) 1500	n.a.	No need to set PHI. See growth stage at last application
Barley	CEU SEU	ARY-0474-001	F	*Pyrenophora teres, Rhynchosporium secalis,*	SC	Chloro thaloni l 500 g/L	Foliar	BBCH 30-59 Winter barley: March-June Spring barley: May-July	2	14 (2nd applicatio n not before BBCH 40)	a) 1.5 b) 3.0	100-400	a) 750 b) 1500	n.a.	No need to set PHI. See growth stage at last application
Tomatoes	CEU SEU	ARY-0474-001	F	*Phytophthora infestans, Alternaria solani, Botrytis cinerea*	SC	Chloro thaloni l 500 g/L	Foliar	BBCH 51-89 June up to PHI 3	1	-	2	500-1500	1000	3	
Wheat	EU	Chlorot halonil 500 g/L SC	F	*Pyrenophora teres, Puccinia hordei, Rhynchosporium secalis,Gaeumanomyces graminis var tritici*	SC	Chloro thaloni l 500 g/L	Foliar	BBCH 30-69 Winter wheat: March-June Spring wheat: May-July	2	14 (2nd applicatio n not before BBCH 40)	a) 1.5 b) 3.0	200-400	a) 750 b) 1500	n.a.	No need to set PHI. See growth stage at last application
Barley	EU	Chlorot halonil 500 g/L	F	*Pyrenophora teres, Puccinia*	SC	Chloro thaloni l 500	Foliar	BBCH 30-59 Winterbarley:	2	14 (2nd applicatio n not	a) 1.5 b) 3.0	200-400	a) 750 b) 1500	n.a.	No need to set PHI. See growth stage at last application

Crop and/or situation (a)	Member State or Country	Product name	F G or I (b)	Pests or Group of pests controlled (c)	Preparation Type (d-f)	Preparation Conc. a.s. (i)	Application method kind (f-h)	Application range of growth stages & season (j)	Application number min-max (k)	Application Interval between application (min)	Application rate per treatment Product L/ha **a) max. rate per appl. b) max. total rate per crop/season** (l)	Application rate per treatment Water L/ha min-max	Application rate per treatment g a.s./ha **a) max. rate per appl. b) max. total rate per crop/season** (l)	PHI (days) (m)	Remarks
		SC		*hordei, Rhynchosporium secalis,Gaeumanomyces graminis var tritici*		g/L		March-June Spring barley: May-July		before BBCH 40)					
Tomatoes	EU	Chlorothalonil 500 g/L SC	F	*Phytophthora infestans, Alternaria sp.*	SC	Chlorothalonil 500 g/L	Foliar	BBCH 51-89 From June up to PHI of 3 days	1	-	2	500-1000	1000	3	
Potato	EU	Chlorothalonil 500 g/L SC	F	*Phytophthora infestans Alternaria solani*	SC	Chlorothalonil 500 g/L	Foliar	BBCH 40-85 May-September	1	-	1.5	200-800	750	28	

(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

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))

None

Further information, Efficacy

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

	According to the latest guidance on the preparation of dossiers for the renewal of active substances, information on efficacy is not required (SANCO/10181/2013 – rev. 2.1, 13 May 2013). More detailed consideration of effectiveness will be fully assessed in the context of subsequent applications for product authorisations.

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

	The representative products have all been authorised at Member State level for > 10 years and have therefore been assessed in line with Uniform Principles. No unacceptable adverse effects are known.

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

	The representative products have all been authorised at Member State level for > 10 years and have therefore been assessed in line with Uniform Principles. No unacceptable adverse effects are known.

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

	R182281	R417888	R418503	R419492	R471811	SYN507900
Activity against target organism	no data	no	no	no	no	no

R611965	R611966	R611967	R613636	R611968	SYN548008 (M3)
no	no data	no data	no	no	no

SYN548581 (M11)	SYN548580 (M2)	M7	M10		
no	no	Not identified	Not identified		

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)	GC-FID CIPAC 288/TC/(M)/- (handbook K)
Impurities in technical a.s. (analytical technique)	Relevant impurities : GC-MS CIPAC 288/TC/(M)/- (handbook K) available for HCB Significant impurities : GC-FID or GC-MS Non-specific methods : gravimetry
Plant protection product (analytical technique)	Chlorothalonil : GC-FID CIPAC method available for formulations (handbook K, 288/WG/(M)/-, also for WP, SC formulations) Relevant impurities : GC-MS

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		Chlorothalonil, SDS-3701 (R182281), SDS-46851(R611965) provisional
Food of animal origin		SDS-3701 (R182281) provisional
Soil		Chlorothalonil
Sediment		Chlorothalonil
Water	surface	Chlorothalonil and R613841 provisional
	drinking/ground	Chlorothalonil and R613841 provisional
Air		Chlorothalonil
Body fluids and tissues		Chlorothalonil and SDS-3701 (R182281) provisional

Monitoring/Enforcement methods

Food/feed of plant origin (analytical technique and LOQ for methods for monitoring purposes)	GC-MS (RAM 365/02), LOQ 0.01 mg/kg (all crop groups) for both chlorothalonil and SDS-3701 (R182281) Or LC-MS/MS (GRM 005.01A), LOQ 0.01 mg/kg (all crop groups) for SDS-3701 (R182281) Extraction efficiency for dry and high oil content commodities is not addressed (both methods) – data gap

Food/feed of animal origin (analytical technique and LOQ for methods for monitoring purposes)	LC-MS/MS (GRM 005.05A), LOQ 0.01 mg/kg (muscle, fat, liver, kidney, blood and eggs) for SDS-3701 or DFG-S19, LC-MS/MS, LOQ 0.01 mg/kg (muscle, fat, liver, kidney, milk and eggs) for SDS-3701 ILV for fat is missing (both methods) – data gap Extraction efficiency is not addressed (both methods) – data gap
Soil (analytical technique and LOQ)	GC-MS (GRM 005.012A), LOQ 0.01 mg/kg for chlorothalonil
Water (analytical technique and LOQ)	GC-MS (GRM 005.10A), LOQ 0.05 µg/L in surface, ground and drinking water for chlorothalonil
Air (analytical technique and LOQ)	GC-MS (GRM 005.014A), LOQ 0.21µg/m^3 for chlorothalonil
Body fluids and tissues (analytical technique and LOQ)	GC-ECD, LOQ 0.05 mg/L for chlorothalonil in body fluids LC-MS/MS, LOQ 0.01 mg/kg for SDS-3701 (R182281) in urine and plasma. GC-ECD, LOQ 0.01 mg/kg for chlorothalonil in body tissues SDS-3701 in tissues: see method for food/feed of animal origin.

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

Substance	Chlorothalonil
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]:	None
Peer review proposal [2] for harmonised classification according to Regulation (EC) No 1272/2008:	None

[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.

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	Rat: 20% based on the radioactivity excreted in urine and bile, excluding bile excretion during the first 4 hours that may be considered as not systemically available since the kidneys and not the liver are the target organs of chlorothalonil. This value is supported by the comparison of urine excretion after oral vs. iv administrations Dog: 8% (within 48 h, bile and urine) Mouse: minimal 10% (within 168 h, urine)
Toxicokinetics	Rat, low dose [^{14}C]-chlorothalonil (1.5 or 5 mg/kg bw p.o): C_{max} of radioactivity in blood: 0.18-0.23 and 0.11-0.31 µg equiv/g, male and female rats, respectively observed at (t_{max}) 2-8 hours in males and 1.5-4 hours in females, with a $T_{1/2}$ of 45-58 hours and 53-60 hours and an AUC_{0-t} of 3.2-5.0 and 2.9-7.6 µg equiv.h/ml in males and females, respectively. Rat, high dose [^{14}C]-chlorothalonil (43 or 200 mg/kg bw p.o.): C_{max} of radioactivity in blood: 2.8-3.2 and 6.0-9.3 µg equiv/g, male and female rats, respectively, observed at (t_{max}) 12 hours and with an AUC_{0-t} of 66.5 and 168.3 µg equiv.h/ml in males and females, respectively. Dog, males, high dose [^{14}C]-chlorothalonil (50 mg/kg bw p.o.) C_{max} of radioactivity in plasma: 0.25 mg equiv/kg tissue observed at (t_{max}) 6 hours and with an AUC_{0-t} of 4.7 mg eq/kg tissue.
Distribution	Widely distributed, highest tissue residues in kidneys. In addition, thyroid, adrenals, blood, bone and spleen showed residue. Affinity for red blood cell binding.
Potential for bioaccumulation	No evidence for accumulation
Rate and extent of excretion	Mainly via faeces (65-90% in mice, > 80% in rats, 89-99% in dogs,generally not completed 168 h post administration. Elimination from plasma is quicker than from blood due to retention observed in blood cells.
Metabolism in animals	Extensive metabolism via hydroxylation to SDS-3701 and glutathione conjugation and subsequently β-lyase pathways
In vitro metabolism	No data – data required
Toxicologically relevant compounds (animals and plants)	Chlorothalonil, R182281 (SDS-3701), R613636 (SDS-47525) and R417888
Toxicologically relevant compounds (environment)	Chlorothalonil, R417888, R418503, R419492, R471811, SYN507900, R611965, R611968, SYN548008 (M3), SYN548581 (M11), M2, M7, M10

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

Rat LD_{50} oral	> 5000 mg/kg bw (rat and mouse)	
Rat LD_{50} dermal	> 5000 mg/kg bw (rat and rabbit)	
Rat LC_{50} inhalation	0.1 mg/L air /4h (nose only)	**H330, STOT SE 3 H335**
Skin irritation	Non-irritant	
Eye irritation	Irritant	**H318**
Skin sensitisation	Sensitising (Maximisation test)	**H317** **Cat 1A**
Phototoxicity	Not phototoxic	

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

Target organ / critical effect	Rat: kidney (histopathological changes, increased weight), forestomach lesions (considered rodent-specific) Mouse: forestomach lesions (considered rodent-specific), kidney (tubular epithelial hyperplasia, increased weight) Dog: body weight, liver and kidney weight, histopathological changes in kidney and adrenals	
Relevant oral NOAEL	90-day, dog: 5.1 mg/kg bw per day 90-day rat: 1.5 mg/kg bw per day (systemic and local NOAEL) 90-day mouse: 47.7 mg/kg bw per day (systemic) and 2.5 mg/kg bw per day (local; considered rodent-specific)	
Relevant dermal NOAEL	21-day, rat: < 60 mg/kg bw per day	
Relevant inhalation NOAEL	2-week (5 days/week, 6 hours/day), rat: $NOAEC_{(systemic)}$ 0.0011 mg/L air based on reduced body weight gain $NOAEC_{(local)}$ < 0.0011 mg/L air based on local irritation of the respiratory tract	

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

In vitro studies	Bacteria reverse mutation assay (3 studies): negative Bacteria DNA-repair assay (differential killing; 1 study): positive Chromosome aberration assay (2 studies); positive -S9, 1 negative +S9 (CHO cells) and 1 equivocal +S9 (human lymphocytes). Forward-mutation assay (2 studies): negative	

	Cell transformation test (1 study): negative	
In vivo studies	Erythrocyte micronucleus test Rat (2 studies): negative Mouse (2 studies): negative Chinese hamster (1 study): negative Bone-marrow chromosome aberration test Rat (2 studies): negative Mouse (2 studies): negative Chinese hamster (3 studies): 2 negative, 1 equivocal at single dosing and negative at repeated dosing. No convincing evidence of genotoxicity *in vivo*	
Photomutagenicity	No data – not required	
Potential for genotoxicity	Chlorothalonil is unlikely to be genotoxic *in vivo*	

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

Long-term effects (target organ/critical effect)	Rat ‘systemic’: kidney (increased weight, focal tubular epithelial hyperplasia); ‘local’: fore-stomach depressions, epithelial hyperplasia and hyperkeratosis Mouse ‘systemic’: kidney (mineralisation foci cortex, cystic atrophic glomeruli with hypertrophic epithelium; ‘local’: fore-stomach (epithelial hyperplasia) Local effects are of low relevance to humans	
Relevant long-term NOAEL	26-months, rat (systemic): 1.8 mg/kg bw per day; (local): 0.7 mg/kg bw per day 18-month, mouse (systemic): 1.9 mg/kg bw per day; (local): < 1.9 mg/kg bw per day	
Carcinogenicity (target organ, tumour type)	Rat: kidney (adenomas and carcinomas) and fore-stomach tumours Mouse: kidney and fore-stomach tumours The forestomach tumours, as local effects, are of low relevance to humans	**H350 Cat 1B**
Relevant NOAEL for carcinogenicity	2-year, rat (systemic): 3.8 mg/kg bw per day (LOAEL: 15 mg/kg bw per day); Local: 1.8 mg/kg bw per day (LOAEL 3.8 mg/kg bw per day) 18-month, mouse (systemic): 30.4 mg/kg bw per day (LOAEL: 119 mg/kg bw per day) Local: 7.8 mg/kg bw per day (LOAEL 30.4 mg/kg bw per day)	

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

Reproduction toxicity

Reproduction target / critical effect	Parental toxicity: histopathological changes in stomach and kidney Reproductive toxicity: sexual maturation delay in females Offspring's toxicity: decreased pup weight	
Relevant parental NOAEL	< 22.6 mg/kg bw per day	
Relevant reproductive NOAEL	100 mg/kg bw per day	
Relevant offspring NOAEL	22.6 mg/kg bw per day	

Developmental toxicity

Developmental target / critical effect	Rat: Maternal toxicity: decreased body weight gain and increased water consumption. Developmental toxicity: decreased number of live fetuses, increased rudimentary ribs Rabbit: Maternal toxicity: decreased body weight gain. Developmental toxicity: skeletal findings (extra ribs, variant sternebrae) Mouse: Maternal toxicity: clinical signs, decreased body weight/bw gain Developmental toxicity: Resorptions, reduced foetal survival and weight; increased incidence of malformations (polydactyly)	
Relevant maternal NOAEL	Rat: < 25 mg/kg bw per day Rabbit: < 5 mg/kg bw per day Mouse: 100 mg/kg bw per day	
Relevant developmental NOAEL	Rat: < 80 mg/kg bw per day Rabbit: 10 mg/kg bw per day Mouse: 100 mg/kg bw per day	

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

Acute neurotoxicity	No evidence of neurotoxicity. NOAEL = 500 mg/kg bw per day (based on body weight losses over the first day following dose administration in a dose range-finding study)	
Repeated neurotoxicity	Reduction in food consumption, body weight and slight decrease in motor activity. NOAEL systemic: 22 mg/kg bw per day	

	NOAEL neurotoxicity: 232 mg/kg bw per day (highest dose tested)	
Additional studies (e.g. delayed neurotoxicity, developmental neurotoxicity)	Not required as not necessary in the absence of neurotoxic signs	

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

Supplementary studies on the active substance	Oral acute reference dose study in rats: NOAEL 250 mg/kg bw. Minimal evidence of renal toxicity at single dosing at 180 mg/kg bw and 1000 mg/kg bw in preliminary dose study. 28-day immunotoxicity test in mice: NOAEL for suppression of the immune system was 345 mg/kg bw per day (the highest dose tested).	
Endocrine disrupting properties	Following evaluation of the relevant available data individually and a subsequent weight of evidence evaluation, it can be concluded that chlorothalonil is unlikely to present endocrine disrupting properties with regards to EATS modalities.	
OECD Framework Level	Study	Results
Level 1	QSAR	negative
	In silico human estrogen receptor α ligand binding	some weak potential to dock into hERα
Level 2	Estrogen receptor binding (rat uterine cytosol) OPPTS 890.1250	no evidence of estrogen receptor binding
	Estrogen receptor transactivation (OECD TG 455) Human Cell Line (HeLa-9903)	no evidence of estrogen receptor agonism
	Androgen receptor binding (rat prostate cytosol) OPPTS 890.1150	no evidence of androgen receptor binding
	Steroidogenesis *in vitro* (OECD TG 456) (Human Cell Line – H295R)	no consistent evidence of effect on androgen or estrogen synthesis
	in vitro aromatase (Human Recombinant) OPPTS 890.1200	not an inhibitor of human recombinant aromatase
	Open literature: In vitro estrogenic activity test (Böehmler & Borowski, 2004)	negative for estrogenic activity
	Open literature, no guideline (Greenlee et al, 2004)	small increase in percentage apoptotic cells for murine embryos, no effect on developing blastocysts or mean number of cells per embryo

	Open literature, no guideline (Kojima et al, 2004)	not an agonist or antagonist of any of the receptors tested
	Open literature, no guideline (TOXCast, Rotroff et al, 2013)	negative
	Open literature, no guideline (TOXCast, Rotroff et al, 2014)	negative
Level 3	Uterotrophic assay (OECD TG 440)	no evidence of estrogenic potential
	Hershberger assay (OECD TG 441)	no evidence of androgenic or anti-androgenic potential
Level 4	• Repeated dose studies studies (OECD TG 407, 408) • 1-generation reproduction toxicity study (OECD TG 415) • Prenatal developmental toxicity study (OECD TG 414) • Chronic toxicity and carcinogenicity studies (OECD TG 451-3)	no evidence for endocrine disrupting properties from the GLP, OECD studies
	Pubertal development and thyroid function in intact juvenile/peripubertal female rats (US EPA OCSPP 890.1450)	no evidence of direct estrogenic or anti-estrogenic effects, no direct effect on pubertal development or thyroid function
	Pubertal development and thyroid function in intact juvenile/peripubertal male rats (US EPA OCSPP 890.1500)	no evidence of direct androgenic or anti-androgenic effects, no direct effect on pubertal development or thyroid function
Level 5	• 2-Generation reproduction toxicity study (OECD TG 416 most recent update)	no evidence for endocrine disrupting properties (delay in sexual maturation in females vaginal opening not reproduced in level 4 studies)
Studies performed on metabolites or impurities	**SDS-3701 (R182281):** - Oral absorption 26-30% (urine and tissue residues (rat)) - Highest levels were found in blood, muscle, fat, and kidney - Mainly excreted via faeces (74-69 % of the low-high dose respectively within 96h after administration and	

	7.1-9.3 % via urine) - Acute oral toxicity: LD_{50}: 50-300 mg/kg bw - 90-day, rat: NOAEL 1 mg/kg bw per day based on reduced in bw gain in female - 1-year dog: NOAEL: 0.83 mg/kg bw per day, based on reduced red blood cells in both sex and reduced body weight gain in female only Genotoxicity: - Bacteria reverse mutation assay: negative - Cell mutation assay (mouse lymphoma L5178Y cells): positive+/-S9 (at cytotoxic concentrations) - Gene mutation assay (Chinese hamster V79 cells): equivocal –S9, negative +S9 - Chromosome aberration assay (CHO cells): positive +/- S9. - *In vivo* mouse micronucleus study: negative - *In vivo* chromosome aberration test: negative - Dominant lethal test: negative - *In vivo* rat liver UDS study: negative Genotoxic potential inconclusive in the absence of *in vivo* follow-up of positive and equivocal results in *in vitro* gene mutation tests. - Chronic toxicity in rats: NOAEL 3.0 mg/kg bw per day based on bone marrow toxicity, no indications for carcinogenicity - Reproductive toxicity (rat): decreased body weight pups (without parental toxicity) NOAEL dev: 1.5 mg/kg bw per day - Developmental toxicity (rabbit): one death and one abortion NOAEL mat and dev: 1 mg/kg bw per day. - Developmental toxicity (rat): increased post implantation loss decreased foetal weight, increased incidence 14^{th} rib at maternal toxic doses NOAEL : 5 mg/kg bw per day **R611965 (SDS-46851):** - Oral absorption: 17-26% (urinary excretion, rat) - T_{max} <1.5 and 2h; $T_{1/2}$ 2.5 h - Mainly excreted via faeces (68-80 % of the low-high dose respectively within 96h after administration and 17-26 % via urine) - after 7 days the highest tissue concentrations were found in the liver, kidneys and adrenal glands - Acute oral toxicity: LD_{50} > 5000 mg/kg bw - Short-term toxicity: Overall NOAEL 50 mg/kg bw per day based on increased relative liver weight, increased incidence of watery stools and decreased body weight (90-day, dog). - 90-day, rat NOAEL197 mg/kg bw per day, based on

	no adverse effect up to the highest dose tested Genotoxicity: - Bacteria reverse mutation assays (3 studies): negative - In vitro SCE assay: negative - Cell mutation assays (mouse lymphoma L5178Y cells; 2 studies): negative - UDS test with rat hepatocytes: negative - *In vivo* micronucleus studies (3 studies): 2 negative, 1 equivocal, repeated negative Unlikely to be genotoxic - Chronic toxicity in rats: NOAEL: 200 mg/kg bw per day, based on reduced food consumption and increased incidence of retinal atrophy, no carcinogenic potential. - Reproductive toxicity (rat): no offspring or reproductive toxicity at parental toxic doses, reproductive NOAEL par: 269 mg/kg bw per day - Developmental toxicity (rabbit): decreased live fetuses and decreased fetal weight at maternal toxic doses, developmental and maternal NOAEL: < 250 mg/kg bw per day. - Developmental toxicity (rat): no maternal or developmental effects; developmental and maternal NOAEL: > 2000 mg/kg bw per day. **R417888:** - Acute oral toxicity: LD_{50} > 2000 mg/kg bw - 90-day toxicity study: NOAEL 200 mg/kg bw per day (the highest dose tested) Genotoxicity: - Bacteria reverse mutation assays (4 studies): negative - In vitro chromosome aberration assays in human lymphocytes (4 studies): 2 positive –S9 and negative +S9, 1 equivocal –S9 and negative + S9, 1 negative +/-S9. - Cell mutation assays (mouse lymphoma L5178Y cells; 4 studies): 2 negative, 1 equivocal, 1 positive +S9 and negative –S9. Genotoxicity concern cannot be excluded No *in vivo* follow up available for the positive/equivocal gene mutation results obtained in vitro. - *In vivo* mouse micronucleus studies (2 studies): negative for clastogenicity. Data gap to address aneugenicity. - *In vivo* rat liver UDS study: negative Genotoxic potential could not be excluded regarding gene mutation and aneugenicity **R418503 (SYN548708)** Genotoxicity:

	- Bacteria reverse mutation assay: negative - In vitro chromosome aberration assay in human lymphocytes: positive - Cell mutation assay (mouse lymphoma L5178Y cells): negative - *In vivo* mouse micronucleus study: negative Unlikely to be genotoxic **R419492 (SYN548765)** Genotoxicity: - Bacteria reverse mutation assay: negative - In vitro chromosome aberration assay in human lymphocytes: negative - Cell mutation assay (mouse lymphoma L5178Y cells): negative Unlikely to be genotoxic **R471811 (SYN548766)** Genotoxicity: - Bacteria reverse mutation assay: negative - In vitro chromosome aberration assay in human lymphocytes: negative - Cell mutation assay (mouse lymphoma L5178Y cells): negative Unlikely to be genotoxic **SYN548008 (SYN548738)** - Genotoxicity: - Bacteria reverse mutation assay: negative - In vitro chromosome aberration assay in human lymphocytes: negative - Cell mutation assay (mouse lymphoma L5178Y cells): negative Unlikely to be genotoxic **SYN548580** Genotoxicity: - Bacteria reverse mutation assay: negative - In vitro chromosome aberration assay in human lymphocytes: negative - Cell mutation assay (mouse lymphoma L5178Y cells): negative Unlikely to be genotoxic **SYN548581 (SYN548764)** - Genotoxicity: No genotoxicity data available. **R611968 (SDS-47525)**

	Genotoxicity: - Bacteria reverse mutation assay: negative - In vitro chromosome aberration assay in human lymphocytes: equivocal - Cell mutation assay (mouse lymphoma L5178Y cells): negative - *In vivo* mouse micronucleus study: negative Unlikely to be genotoxic **R613636** Genotoxicity: - Bacteria reverse mutation assay: negative - In vitro chromosome aberration assay in human lymphocytes: positive - Cell mutation assay (mouse lymphoma L5178Y cells): - Gene mutation assay (Chinese hamster V79 cells): negative - In vivo mouse micronucleus study: negative for clastogenicity. Data gap to address aneugenicity. Genotoxic potential could not be excluded: aneugenicity has not been addressed **SYN507900 (SDS-66882)** Genotoxicity: - Bacteria reverse mutation assay: negative - *In vitro* chromosome aberration assay in human lymphocytes: positive - Cell mutation assay (mouse lymphoma L5178Y cells): negative - *In vivo* mouse micronucleus study: negative Unlikely to be genotoxic

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

	In case of occupational exposure, skin and eye irritation might occur. The reported prevalence of contact dermatitis and respiratory symptoms is low. Dermal effects are mainly caused by irritative effects of chlorothalonil, allergic reactions seem very rare. There are no indications for severe ocular effects or for respiratory sensitization.

Summary[3] (Regulation (EU) N°1107/2009, Annex II, point 3.1 and 3.6) *Chlorothalonil*	Value (mg/kg bw (per day))	Study	Uncertainty factor
Acceptable Daily Intake (ADI)	0.015	90-day study in rat, supported by the 2-year study in rat	100
Acute Reference Dose (ARfD)	0.05	Developmental toxicity study in rabbit	100
Acceptable Operator Exposure Level (AOEL)	0.003	90-day study in rat	100*
Acute Acceptable Operator Exposure Level (AAOEL)	0.01	Developmental study in rabbit	100*

* Including correction for limited oral absorption/bioavailability (20%)

SDS-3701 / R182281	Value (mg/kg bw (per day))	Study	Uncertainty factor
Acceptable Daily Intake (ADI)	Not established		
Acute Reference Dose (ARfD)	Not established		
Acceptable Operator Exposure Level (AOEL)	Not established		
Acute Acceptable Operator Exposure Level (AAOEL)	Not established		

SDS-46851 (R611965)	Value (mg/kg bw (per day))	Study	Uncertainty factor
Acceptable Daily Intake (ADI)	0.5	dog, 90-day	100
Acute Reference Dose (ARfD)	0.83	Developmental toxicity study in rabbit	300 (1)
Acceptable Operator Exposure Level (AOEL)	Not relevant		
Acute Acceptable Operator Exposure Level (AAOEL)	Not relevant		

(1) Increased UF by 3 as based on a LOAEL

R417888	Value (mg/kg bw (per day))	Study	Uncertainty factor
Acceptable Daily Intake (ADI)	Not established		

[3] If available include also reference values for metabolites

Acute Reference Dose (ARfD)	Not established		
Acceptable Operator Exposure Level (AOEL)	Not established		
Acute Acceptable Operator Exposure Level (AAOEL)	Not established		

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

Representative formulation (A14111B, SC, 400 g/L)	*In vitro* human study Concentrate: 0.6% (400 g/L) Spray dilution 1: 12% (10 g/L) Spray dilution 2: 12% (1.88 g/L) Spray dilution 3: 16% (0.67 g/L)
Representative formulation (Oxon Chlorothalonil 500 g/L SC)	*Concentrate (500 g/l): 2 %* Spray dilution 1: 11% (2.33 g/L) Spray dilution 2: 12% (2 g/L) Spray dilution 3: 13% (1.875 g/L) Spray dilution 3: 25% (1 g/L) Spray dilution 3: 26% (0.94 g/L) *based on in vivo rat (with Chlorothalonil 720 g/ SC) and in vitro (with Chlorothalonil 232 g/L + Azoxystrobin 68 g/L) human/rat data*
Representative formulation (*ARY-0474-001*, SC, 500 g/L)	*Concentrate (500 g/l):* 3% Spray dilution 3: 21% (1.88 g/L) Spray dilution 3: 58% (0.67 g/L) *based on in vivo rat and in vitro human/rat data (with Epoxiconazole + chlorothalonil 387 g/L)*

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

Operators Representative formulation (A14111B, SC, 400 g/L)	<u>Use</u>*: cereal, tractor mounted downward, application rate 750 g a.s./ha* <u>Exposure estimates</u> (model): <u>% of AOEL</u> <u>German model</u> Without PPE: 1863 PPE (gloves, coverall, sturdy footwear, hood&visor): 87 <u>UK POEM</u> Without PPE: 21278 PPE (gloves): 3488 <u>EFSA calculator</u> Without PPE: 668 PPE (gloves): 55 <u>Use</u>*: tomatoes, tractor mounted downward, application rate 1000 g a.s./ha* <u>German model:</u>

<table>
<tr><td></td><td colspan="5">Without PPE: 3261
PPE (gloves, coverall, sturdy footwear, hood&visor): 149
<u>UK POEM</u>
Without PPE: 7787
PPE (gloves): 1230
<u>EFSA calculator</u>
Without PPE: 1038
PPE (gloves): 82

<u>Use</u>: tomatoes, hand-held downward, application rate 1000 g a.s./ha
<u>German model:</u>
Without PPE: 3831
PPE (gloves, coverall, sturdy footwear, hood&visor): 294
<u>UK POEM</u>
Without PPE: 18627
PPE (gloves and impermeable coverall): 3485
<u>EFSA calculator</u>
Without PPE: 2569
PPE (gloves): 2157</td></tr>
<tr><td>Workers
Representative formulation (A14111B, SC, 400 g/L)</td><td colspan="5"><u>Use</u>: cereal, crop inspection, application rate 750 g a.s./ha
<u>Exposure estimates</u> (model): <u>% of AOEL</u>
<u>German re-entry model+DFR</u>
Without PPE: 252
PPE (gloves and protective clothing): 13

<u>Use</u>: tomatoes, hand-harvesting, application rate 1000 g a.s./ha
<u>German re-entry model[(1)]</u>
Without PPE: 1778
PPE (gloves and protective clothing): 89</td></tr>
<tr><td rowspan="8">Bystanders and residents
Representative formulation (A14111B, SC, 400 g/L)</td><td rowspan="2">% of AOEL</td><td colspan="2">Bystander</td><td colspan="2">Resident</td></tr>
<tr><td>Adult</td><td>Child</td><td>Adult</td><td>Child</td></tr>
<tr><td>Cereals (1 m distance)</td><td>139</td><td>108</td><td>27</td><td>44</td></tr>
<tr><td>Cereals (5 m distance)</td><td>29</td><td>22</td><td>13</td><td>22</td></tr>
<tr><td>Tomato, tractor (1 m distance)</td><td>246</td><td>192</td><td>27</td><td>44</td></tr>
<tr><td>Tomato, tractor (5 m distance)</td><td>51</td><td>40</td><td>13</td><td>23</td></tr>
<tr><td>Tomato, handheld (3 m distance)</td><td>715</td><td>561</td><td>61</td><td>94</td></tr>
<tr><td>Tomato, handheld (5 m distance)</td><td>324</td><td>256</td><td>33</td><td>52</td></tr>
</table>

	Tomato, handheld (15 m distance)	60	50	13	23

Operators Representative formulation (Oxon Chlorothalonil 500 g/L SC)	<u>Use</u>: *cereal, tractor mounted downward, application rate 750 g a.s./ha* <u>Exposure estimates</u> (model): <u>% of AOEL</u> <u>German model</u> Without PPE: 2249 PPE (gloves, coverall, sturdy footwear, hood&visor): 96 <u>UK POEM</u> Without PPE: 10480 PPE (gloves): 1643 <u>Use</u>: *potato, tractor mounted downward, application rate 750 g a.s./ha* <u>Exposure estimates</u> (model): <u>% of AOEL</u> <u>German model</u> Without PPE: 4143 PPE (gloves, coverall, sturdy footwear, hood&visor): 176 <u>UK POEM</u> Without PPE: 10480 PPE (gloves): 1643 <u>Use</u>: *tomatoes, tractor mounted downward, application rate 1000 g a.s./ha* <u>German model:</u> Without PPE: 5330 PPE (gloves, coverall, sturdy footwear, hood&visor): 227 <u>UK POEM</u> Without PPE: 6717 PPE (gloves): 983 <u>Use</u>: *tomatoes, hand-held downward, application rate 1000 g a.s./ha* <u>German model:</u> Without PPE: 6930 PPE (gloves, coverall, sturdy footwear, hood&visor): 376 <u>UK POEM</u> Without PPE: 15233 PPE (gloves and impermeable coverall): 2710
Workers Representative formulation (Oxon Chlorothalonil 500 g/L SC)	<u>Use</u>: *cereal, crop inspection, application rate 750 g a.s./ha* <u>Exposure estimates</u> (model): <u>% of AOEL</u> <u>German re-entry model+DFR</u> Without PPE: 273 PPE (gloves and protective clothing): 14

<table>
<tr><td></td><td><u>Use</u>: potato, crop inspection, application rate 750 g a.s./ha
<u>Exposure estimates</u> (model): <u>% of AOEL(1)</u>
<u>German re-entry model+DFR</u>
Without PPE: 325
PPE (gloves and protective clothing): 16

<u>Use</u>: tomatoes, hand-harvesting, application rate 1000 g a.s./ha
<u>German re-entry model</u> <u>% of AOEL(1)</u>
Without PPE: 2778
PPE (gloves and protective clothing): 139</td></tr>
<tr><td>Bystanders and residents
Representative formulation (Oxon Chlorothalonil 500 g/L SC)</td><td>
<table>
<tr><th rowspan="2">% of AOEL</th><th colspan="2">Bystander</th><th colspan="2">Resident</th></tr>
<tr><th>Adult</th><th>Child</th><th>Adult</th><th>Child</th></tr>
<tr><td>Cereals (1 m distance)</td><td>150</td><td>117</td><td>28</td><td>46</td></tr>
<tr><td>Cereals (5 m distance)</td><td>31</td><td>24</td><td>13</td><td>23</td></tr>
<tr><td>Potato (1 m distance)</td><td>300</td><td>234</td><td>31</td><td>48</td></tr>
<tr><td>Potato (5 m distance)</td><td>62</td><td>48</td><td>14</td><td>24</td></tr>
<tr><td>Tomato, tractor (1 m distance)</td><td>385</td><td>300</td><td>37</td><td>57</td></tr>
<tr><td>Tomato, tractor (5 m distance)</td><td>79</td><td>62</td><td>15</td><td>25</td></tr>
<tr><td>Tomato, handheld (3 m distance)</td><td>1116</td><td>874</td><td>91</td><td>133</td></tr>
<tr><td>Tomato, handheld (5 m distance)</td><td>505</td><td>397</td><td>46</td><td>69</td></tr>
<tr><td>Tomato, handheld (15 m distance)</td><td>93</td><td>75</td><td>16</td><td>27</td></tr>
</table></td></tr>
<tr><td>Operators
Representative formulation (ARY-0474-001, SC, 500 g/L)</td><td><u>Use</u>: cereal, tractor mounted downward, application rate 750 g a.s./ha
<u>Exposure estimates</u> (model): <u>% of AOEL</u>
<u>German model</u>
Without PPE: 3586
PPE (gloves, coverall, sturdy footwear, half mask, hood&visor): 143
<u>UK POEM</u>
Without PPE: 37856
PPE (gloves): 5957
<u>EFSA calculator</u></td></tr>
</table>

<table>
<tr><td></td><td>Without PPE: 2046
PPE (gloves, hood&visor): 89

<u>Use</u>: tomatoes, tractor mounted downward, application rate 1000 g a.s./ha
<u>German model:</u>
Without PPE: 11970
PPE (gloves, half mask, coverall, sturdy footwear, hood&visor): 496
<u>UK POEM</u>
Without PPE: 28510
PPE (gloves): 4307
<u>EFSA calculator</u>
Without PPE: 4201
PPE (gloves, hood&visor): 185

<u>Use</u>: tomatoes, hand-held downward, application rate 1000 g a.s./ha
<u>German model:</u>
Without PPE: 14253
PPE (gloves, half mask, coverall, sturdy footwear, hood&visor): 613
<u>UK POEM</u>
Without PPE: 68117
PPE (gloves and impermeable coverall): 12330
<u>EFSA calculator</u>
Without PPE: 9269
PPE (gloves, FP2/P2 mask): 7672</td></tr>
<tr><td>Workers
Representative formulation (ARY-0474-001, SC, 500 g/L)</td><td><u>Use</u>: cereal, crop inspection, application rate_750 g a.s./ha
<u>Exposure estimates</u> (model): <u>% of AOEL(1)</u>
<u>German re-entry model</u>
Without PPE: 525
PPE (gloves and protective clothing): 26

<u>Use</u>: tomatoes, hand-harvesting, application rate 1000 g a.s./ha
<u>German re-entry model</u> <u>% of AOEL(1)</u>
Without PPE: 6444
PPE (gloves and protective clothing): 322</td></tr>
<tr><td>Bystanders and residents
Representative formulation (ARY-0474-001, SC, 500 g/L)</td><td><table>
<tr><td rowspan="2">% of AOEL</td><td colspan="2">Bysander</td><td colspan="2">Resident</td></tr>
<tr><td>Adult</td><td>Child</td><td>Adult</td><td>Child</td></tr>
<tr><td>Cereals (1 m distance)</td><td>242</td><td>189</td><td>40</td><td>61</td></tr>
<tr><td>Cereals (5 m distance)</td><td>50</td><td>39</td><td>15</td><td>26</td></tr>
</table></td></tr>
</table>

	Tomato, tractor (1 m distance)	893	697	74	106
	Tomato, tractor (5 m distance)	184	144	23	35
	Tomato, tractor (10 m distance	94	73	16	26
	Tomato, handheld (20 m distance)	138	111	19	31

(1) worker exposure was estimated with a Dislodgeable Foliar Residue (DFR) of 1 µg/cm^2 per kg a.s./ha, while the current Tier I estimates should be 3 µg/cm^2 per kg a.s./ha; multiplying worker exposure by 3 implies that representative uses in tomatoes, hand-harvesting, application rate 1000 g a.s./ha (all three products) would exceed the AOEL, even when PPE (gloves and protective clothing) is considered

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

Substance :	Chlorothalonil
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 aended][4] :	Skin sensitization Category 1, H317 “May cause an allergic skin reaction” Eye damage Category 1, H318 “Causes serious eye damage” Acute toxicity (inhalation) Category 2, H330 “Fatal if inhaled” Specific target organ toxicity – single exposure Category 3, H335 “May cause respiratory irritation” Carcinogenicity Category 2, H351 “Suspected of causing cancer”
Peer review proposal[5] for harmonised classification according to Regulation (EC) No 1272/2008:	Skin sensitization Category 1A, H317 “may cause an allergic skin reaction” Carcinogenicity Category 1B, H350 “may cause cancer” No further amendments proposed

[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.

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	Tomato*	3x 2.33 kg as/ha	1, 7, 14
			1x 1.6 kg as/ha	0, 14, 21, 28
	Root crops	Carrot*	3x 1.6 kg as/ha	1, 7, 14, 21
	Leafy crops	Lettuce*	4x 1.75 kg as/ha	1, 3, 7, 10, 14, 21
		Celery*	12x 2.5 kg as/ha	7, 21
	Cereals/grass crops	Wheat*	1x 1.0 kg as/ha	0, 28, 28 days before harvest, maturity
	Pulses/Oilseeds	Snap bean*	4x 2.46 kg as/ha	7, 28
		Pea*	1x 1.4 kg as/ha	0, 7, 14, 30, 41
	Miscellaneous			
	*Validity pending demonstration of integrity and reliability, and that the studies sufficiently address current requirements and recommendations **(data gap)**			

Rotational crops (metabolic pattern) **OECD Guideline 502**	**Crop groups**	**Crop(s)**	**PBI** (days)	**Comments**
	Root/tuber crops	Carrot*	30, 88	* application rate in kg/ha unknown, validity pending demonstration of integrity and reliability #supportive (underdosed, low residues limiting sufficient rate of indentification, 30d PBI only)
	Leafy crops	Lettuce*	30, 88	
	Cereals (small grain)	Wheat*	30, 88	
	Cereals	Wheat	30, 120, 365	
	Leafy crops	Lettuce	30, 120, 365	
	Root/tuber crops	Carrot	30, 120, 365	
	Cereals	Barley#	30	
	Leafy crops	Spinach#	30	
	Root/tuber crops	Radish#	30	
Rotational crop and primary crop metabolism similar?	Inconclusive, pending full elucidation of residue pattern in primary crops Parent chlorothalonil is a minor residue (not detected) in rotational crops. R611965 (SDS-46851) and R417888 were significant metabolites in all rotational crops. These metabolites are known soil metabolites with long DT50 values. R182281 (SDS-3701) was present at low levels.			

Processed commodities (standard hydrolysis study) **OECD Guideline 507**	**Conditions**	Chlorothalonil (% AR)	R182281 (SDS-3701) (% AR)	R613636 (SDS-19221) (% AR)
	20 min, 90°C, pH 4 [C]	105	1.9	-
	20 min, 90°C, pH 6 [C]	85	5.3	2.8

60 min, 100°C, pH 5 [C]	81	19	3.4
20 min, 120°C, pH 6 [C]	3.1	48	23
20 min, 120°C, pH 6 [A]	26	59	15
20 min, 120°C, pH 4 [C]	73	17	2.3

[C] Citrate buffer; [A] actetate buffer

Residue pattern in processed commodities similar to residue pattern in raw commodities?	The residue definitions derived for primary crops should be applied also to the processed commodities. 4-amino-2,5,6-trichloroisophthalonitrile has been identified up to 28% AR in the citrate buffer solution and was considered an artefact. It should be demonstrated that this compound will not result from degradation of chlorothalonoil in the actual processing conditions (data gap).
Plant residue definition for monitoring (RD-Mo) **OECD Guidance, series on pesticides No 31**	Primary crops and processed commodities: 1. Chlorothalonil 2. R182281 (SDS-3701) plus 3. R611965 (SDS-46851) for rotational crops, if residues in rotational crops will have to be monitored: The proposed RDs are considered as **provisional** and are applicable to all crops. Residue definition will be finalised pending upon the outcome of the outstanding data on metabolism study reporting, storage stability and toxicity for all compounds of relevance.
Plant residue definition for risk assessment (RD-RA)	Primary crops: 1. Chlorothalonil and its conjugates 2. R182281 (SDS-3701) and its conjugates plus 3. R613636 (SDS-19221) in addition for processed commodities Rotational crops: R611965 (SDS-46851) / R417888, and conjugates of metabolites R613636, R613800 (C15) and R611968 The proposed RDs are considered as **provisional**. Residue definitions to be finalised pending upon the outcome of the outstanding data on metabolism study reporting, storage stability and toxicity for all compounds of relevance and rotational crops assessement. Additionally, for processed commodities, the potencial inclusion of 4-amino-2,5,6-trichloroisophthalonitrile is pendig the outcome of requested information.
Conversion factor (monitoring to risk assessment)	Pending finalisation of residue defintions. Currently it is not possible to derive conversion factors for relevant metabolites based on the available residue trials and metabolism studies.

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	Chlorothalonil*: 0.22; 0.65; 2.18	21	Pending#
		R182281 (SDS-3701)*: 0.011; 0.033; 0.11	21	Pending#
		Chlorothalonil: 1.59	14	Pending#
	Goat/Cow	Chlorothalonil*: 0.115; 1.15	8	Pending#
		R182281 (SDS-3701)*: 0.0068; 0.075	9	Pending#
	Pig	-		
	Fish	- mg/kg DM		Relevance and findings of bioaccumulation study to be assessed **(data gap)**
	*Validity pending demonstration of integrity and reliability, and that the studies sufficiently address current requirements and recommendations **(data gap)** # Availability of sufficient and reliable data on magnitude of residues in feed item is crucial for dietary burden calculation; hence, the N rate cannot be defined.			

Time needed to reach a plateau concentration in milk and eggs (days)	Study with chlorothalonil: • Egg yolk: 13 days • Milk: no data Study with R182281 (SDS-3701): • Egg yolk: 21 days (low and mid dose group), 16 days (high dose group) • Milk: by day 7
Animal residue definition for monitoring (RD-Mo) **OECD Guidance, series on pesticides No 31**	R182281 (SDS-3701) Residue definition should be considered **provisional**, pending completion of data on ruminant metabolism
Animal residue definition for risk assessment (RD-RA)	R182281 (SDS-3701) Residue definition should be considered **provisional**, pending completion of data on ruminant metabolism
Conversion factor (monitoring to risk assessment)	n.a.
Metabolism in rat and ruminant similar (Yes/No)	Yes
Fat soluble residues (Yes/No) **(FAO, 2009)**	No

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	Following application of [phenyl-U-14C]-chlorothalonil to bare soil at 7.5 kg a.s/ha, lettuce, carrot, and wheat were sown in the treated soil after periods of 30, 120 and 365 days. • Parent is hardly detected. • Main metabolites were coeluting compound R611965 (SDS-46851) and R417888 (30-73% TRR). Both metabolites have presumably different toxicity. Hence, contribution of each metabolite in coeluted fraction should be provided **(data gap).** • Levels of R182281 (SDS-3701) were low (<8% TRR). A fraction corresponding to conjugates of R611968, R613363 and metabolite R613800 (C15) was identified as significant proportion in all parts of rotational crops (11-41%TRR).
Field rotational crop study OECD Guideline 504	Two residue trials in NEU. Trials have to be validated by sufficient storage stabilty data for chlorothalonil and R182281 (SDS-3701) over the entire storage period of samples (up to 30 months) **(data gap)** Preliminary findings: Residues of chlorothalonil and R182281 (SDS-3701) were not found above the LOQ in spinach, cereals and carrot planted at nominal intervals of 30, 60 and 365 days after treatment of bare soil with chlorothalonil at a nominal rate of 2 kg a.s./ha. No residues of R611965 (SDS-46851) were found in crops from the 365 day plant-back interval, although, significant residues levels were found in all crops in the 30 and 60 day plant-back intervals (spinach 0.01-0.04 mg/kg; cereal grain 0.01-0.11 mg/kg, straw 0.08-0.29 mg/kg, roots <0.01-0.01 mg/kg, leaves <0.01-0.04 mg/kg)

Stability of residues (Regulation (EU) N° 283/2013, Annex Part A, point 6.1)
OECD Guideline 506

Plant products (Category)	**Commodity**	**T** (°C)	**Stability** (Months)			
			Chloro-thalonil	SDS-3701	SDS-46851	SDS-19221
High water content	Cucumbers, melons, apples, broccoli, brussels sprouts, head cabbage, cauliflower, French bean, leek, peas, plum, banana (homogenised fortified, prepared in acid)	≤-18°C	24	#		
	Onions (homogenised fortified, prepared in acid)	≤-18°C	24	<3		
	Tomatoes	≤-18°C	24	24	30	
High oil content	Olive (homogenised fortified, prepared in acid)	≤-18°C	24	24		
High protein content	Lentil	≤-18°C			30	

High starch content	Carrots, potatoes, sugar beets (fortified, prepared in acid)	≤-18°C	24	24		
	Wheat grain	≤-18°C			30	
	Wheat grain, (homogenised fortified, prepared in toluene)	-20°C	2			
High acid content	Oranges	≤-18°C			30	
	Strawberries (homogenised fortified, prepared in acid)	≤-18°C	24	24		
	Grapes (homogenised fortified, prepared in acid)	≤-18°C	24	3		
Processed commodities	Pearl barley, beer, wheat bran, wheat flour, peanut meal, peanut oil, cooked beans with pods, tomato juice, tomato paste, tomato puree	≤-18°C				24
Other	Cereal straw (homogenised fortified, prepared in acid)	≤-18°C	9	12		

#conclusion for the whole category cannot be derived, further differentiation on commodity group level is recommended

Data gap is set to demontstrate the storage stability of chlorthalonil and metabolite SDS-3701 in cereal grain and for chlorothalonil in cereal straw, according with the storage time of the supervised residue trials.

Animal	**Animal commodity**	**T** (°C)	**Stability** (Month/Year)			
			R182281 (SDS-3701)			
Bovine	Muscle	-20°C	18			
Bovine	Liver	-20°C	24			
Bovine	Kidney	-20°C	3			
Bovine	Milk	-20°C	18			
Poultry	Egg	-20°C	18			
Bovine	Fat	-23°C (median)	3			

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)						
Tomatoes (1x 1000 g/ha, PHI 3 d)	NEU	*RD for monitoring:* Chlorothalonil: 0.13; 0.15; 0.25; 0.26; 0.36; 0.44; 0.63; 0.83 SDS-3701: 8x <0.01 *RD for risk assessment:* None	Sufficient trial data are available to propose MRL value for chlorothalonil. This value is lower than the existing MRL. It should be noted that the trials were not performed in accordance with the proposed residue definition for risk assessment (data gap).	1.5 <0.01	0.83 (mo) <0.01(mo)	0.31(mo) <0.01(mo)
	SEU	*RD for monitoring:* Chlorothalonil: 0.06; 0.12; 0.17; 0.36; 0.46; 2x 0.58; 0.59 SDS-3701: 8x <0.01 *RD for risk assessment:* none		1.5 <0.01	0.59 (mo) <0.01(mo)	0.41(mo) <0.01(mo)
Barley grain (2x 750 g/ha, interval 14 days, BBCH 30-59)	NEU	*RD for monitoring:* Chlorothalonil: none SDS-3701: # *2x<0.01; 3x <0.02* *RD for risk assessment:* none	None of the selected trials with chlorothalonil and SDS-3701 in barley grain are acceptable since the samples storage time exceeds the demonstrated stability in cereal grain. # Trials *in italic* are acceptable only when storage stability up to 12 months is demonstrated for metabolite SDS-3701 in cereal grain	-	-	-
	SEU	*RD for monitoring:* Chlorothalonil: none SDS-3701: # *1x <0.01; 4x <0.02* *RD for risk assessment:* none		-	-	-
Barley straw	NEU	*RD for monitoring:* Chlorothalonil: none	None of the selected trials with chlorothalonil in barley straw are	-	-	-

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)
		SDS-3701: 0.02; 0.11; 0.19; 0.23; 1.1 *RD for risk assessment:* none	acceptable since the samples storage time exceeds the demonstrated stability in cereal straw It should be noted that the trials were not performed in accordance with the proposed residue definition for risk assessment (data gap).			
	SEU	*RD for monitoring:* Chlorothalonil: none SDS-3701: 0.06; 0.07; 0.11; 0.13; 0.13 RD for risk assessment: none		-	-	-
Wheat grain (2x 750 g/ha, interval 14 days, BBCH 30-69)	NEU	*RD for monitoring:* Chlorothalonil: none SDS-3701: none *RD for risk assessment:* none	There are no acceptable residue trials with chlorothalonil in NEU in wheat grain regarding compliance with cGAP and demonstrated storage stability of the samples. In SEU two trials were selected, which were complied with cGAP, however not regarding demonstrated storage stability for cereal grain. # Trials *in italic* are acceptable only when storage stability up to 12 months is demonstrated for metabolite SDS-3701 in cereal grain It should be noted that the trials were not performed in accordance with the proposed residue definition for risk assessment (data gap).	-	-	-
	SEU	*RD for monitoring:* Chlorothalonil: none SDS-3701: # 2x <0.02 *RD for risk assessment:* none		-	-	-
Wheat straw	NEU	*RD for monitoring:* Chlorothalonil: none SDS-3701: none *RD for risk assessment:* none		-	-	-
	SEU	*RD for monitoring:* Chlorothalonil: 0.69; 2.1 SDS-3701: 0.03; 0.12 *RD for risk assessment:* none		-	-	-

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)
Potatoes (1x 750 g/ha, PHI 28 days)	NEU	*RD for monitoring:* Chlorothalonil: 4x <0.01 SDS-3701: 4x <0.02 *RD for risk assessment:* none	Sufficient trial data are available to derive MRL value. The calculated MRL is in line with the existing MRL. It should be noted that the trials were not performed in accordance with the proposed residue definition for risk assessment (data gap).	0.01** 0.02*	$<0.01_{(mo)}$ $<0.02_{(mo)}$	$<0.01_{(mo)}$ $<0.02_{(mo)}$
	SEU	*RD for monitoring:* Chlorothalonil: 4x <0.01 SDS-3701: 4x <0.02 *RD for risk assessment:* none				
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**			
		None	Data gap			

(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 ($STMR_{Mo}$).

Inputs for animal burden calculations

No reliable dietary burden can be calculated due to several data gaps identified in the residue section.

Feed commodity	Median dietary burden		Maximum dietary burden	
	(mg/kg)	**Comment**	(mg/kg)	**Comment**
Representative uses, residues of chlorothalonil and its conjugates and of R182281 (SDS-3701) and its conjugates				
Barley, straw	Data gap		Data gap	
Barley, grain	Data gap		Data gap	
Wheat, straw	Data gap		Data gap	
Wheat, grain	Data gap		Data gap	
Wheat gluten, meal	Data gap		Data gap	
Wheat, milled by-products	Data gap		Data gap	
Brewer’s grain, dried	Data gap		Data gap	
Distiller’s grain, dried	Data gap		Data gap	
Potato, culls	Data gap		Data gap	
Potato, process waste	Data gap		Data gap	
Potato, dried pulp	Data gap		Data gap	

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

No reliable dietary burden can be calculated due to several data gaps identified in the residue section. Therefore, the assessment of residues from livestock feeding studies cannot be finalised

MRL calculations	**Ruminant**				**Pig/Swine**		**Poultry**		**Fish**	
Highest expected intake (mg/kg bw/d) (mg/kg DM for fish)	Beef cattle		Ram/Ewe		Breeding		Broiler		Carp	
	Dairy cattle		Lamb		Finishing		Layer		Trout	
							Turkey		Fish intake >0.1 mg/kg DM	
Intake >0.004 mg/kg bw										
Feeding study submitted										
Representative feeding level (mg/kg bw/d, mg/kg DM for fish) and **N rates**	Level:	Beef: Dairy:	Level:	Lamb: Ewe:	Level	Breed: Finish:	Level	B or T: Layer:	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										
Fat										
Meat[b]										
Liver										
Kidney										
Milk[a]										
Eggs										
Method of calculation[c]	It for milk, Ln for fat, muscle, Tf for kidney, liver		It for milk, muscle, Ln for fat, liver, Tf for kidney							

(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.

STMR calculations	**Ruminant**				**Pig/Swine**		**Poultry**		**Fish**	
Median expected intake (mg/kg bw/d) (mg/kg DM for fish)	Beef cattle		Ram/Ewe		Breeding		Broiler		Carp	
	Dairy cattle		Lamb		Finishing		Layer		Trout	
							Turkey			
Representative feeding level (mg/kg bw/d, mg/kg DM for fish) and **N rates**	Level:	Beef: Dairy:	Level:	Lamb: Ewe:	Level	Breed: Finish:	Level	B or T: Layer:	Level	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										
Fat										
Meat[(a)]										
Liver										
Kidney										
Milk										
Eggs										
Method of calculation[(c)]										

[(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.

Conversion Factors (CF) for monitoring to risk assessment

Animal products
Not applicable

Plant products
Not applicable

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

The available data address only the residue definition for monitoring.

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				
Chlorothalonil: tomato, juice	4	0.09; 0.10; 0.11; 0.13;	0.11	Data gap
SDS-3701: tomato, juice	4	3x 1.0; 1.5	1.0	Data gap
Chlorothalonil: tomato, puree	4	4x <0.001	<0.001	Data gap
SDS-3701: tomato, puree	4	5.5; 6.0; 6.5; 7.5	6.3	Data gap
Chlorothalonil: tomato, canned	4	4x <0.001	<0.001	Data gap
SDS-3701: tomato, canned	8	4x 1.0; 3x 2.0; 2.5	1.5	Data gap
Chlorothalonil: wheat, middlings	1	<0.5	<0.5	Data gap
Chlorothalonil: wheat, wholemeal bread	1	<0.5	<0.5	Data gap

[(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	Chlorothalonil: 0.015 mg/kg bw per day R182281 (SDS-3701): Not established (a genotoxic potential could not be excluded) R613636 (SDS-19221): Not established (a genotoxic potential could not be excluded)
TMDI according to EFSA PRIMo	Assessment at a higher tier level not finalised. Harmful effects on human health cannot be excluded.
NTMDI, according to (to be specified)	-
IEDI (% ADI), according to EFSA PRIMo	-
NEDI (% ADI), according to (to be specified)	-
Factors included in the calculations	-
ARfD	Chlorothalonil: 0.05 mg/kg bw R182281 (SDS-3701): Not established (a genotoxic potential could not be excluded) R613636 (SDS-19221): Not established (a genotoxic potential could not be excluded)
IESTI (% ARfD), according to EFSA PRIMo	Assessment at a higher tier level not finalised. Harmful effects on human health cannot be excluded.
NESTI (% ARfD), according to (to be specified)	-
Factors included in IESTI and NESTI	-

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

<table>
<tr><th>Code[(a)]</th><th>Commodity/Group</th><th colspan="2">MRL/Import tolerance[(b)] (mg/kg) and Comments</th></tr>
<tr><td colspan="4">Plant commodities</td></tr>
<tr><td colspan="4">Residue definition for monitoring : Chlorothalonil #</td></tr>
<tr><td></td><td>Tomatoes</td><td rowspan="4">MRLs are not proposed since a consumer safety concern was identified for the representative uses.</td><td>Sufficient trial data is available</td></tr>
<tr><td></td><td>Barley grain</td><td>There are no sufficient trials availabe for the use on barley grain</td></tr>
<tr><td></td><td>Wheat grain</td><td>There are no sufficient trials availabe for the use on wheat grain</td></tr>
<tr><td></td><td>Potatoes</td><td>Sufficient trial data are available</td></tr>
<tr><td colspan="4">Residue definition for monitoring : R182281 (SDS-3701) #</td></tr>
<tr><td></td><td>Tomatoes</td><td rowspan="4">MRLs are not proposed since a consumer safety concern was identified for the representative uses.</td><td>Sufficient trial data are available. NEU and SEU data sets are not significantly different according to the U-test. Therefore, the data sets can be combined.</td></tr>
<tr><td></td><td>Barley grain</td><td>There are no sufficient trials availabe</td></tr>
<tr><td></td><td>Wheat grain</td><td>There are no sufficient trials availabe</td></tr>
<tr><td></td><td>Potatoes</td><td>Sufficient trial data are available.</td></tr>
<tr><td colspan="4">Animal commodities</td></tr>
<tr><td colspan="4">Residue definition for monitoring : R182281 (SDS-3701) #</td></tr>
<tr><td colspan="4">The assessment whether MRLs should be set for animal commodities is not finalised.</td></tr>
</table>

provisional residue definitions

(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.

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	max. 23.8% after 92 d [14C]-uniform ring label (n=18)
Non-extractable residues after 100 days	max. 43.4% after 125 d [14C]- uniform ring label (n=18)
Metabolites requiring further consideration - name and/or code, % of applied (range and maximum)	R182281 (SDS-3701) max. 32.2% after 7 d (n=17) R417888 max. 15.2% after 30d (n=20) R418503 max. 6.1% after 90 d (n=5) R419492 max 12.4% after 120 d (n=9) R471811 max. 11.9% after 125 d (n=11) SYN507900 (SDS-66882) max. 5.8% after 120 d (n=3) R611965 (SDS-46851) max. 13.2% after 152 d (n=10) R611966 (SDS-47523) max. 8.1% after 7 d (n=5) R611967 (SDS-47524) max. 13.24% after 4 d (n=4) R611968 (SDS-47525) max 6.5% after 4d* (n=3) R613636 (SDS-19221) max. 10.4% after 7 d (n=8) *only >5% on one occasion

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

Mineralisation after 100 days	0.5% after 122 d [14C]-uniform ring label (n= 3)
Non-extractable residues after 100 days	Max. 41.2% after 92 d [14C]-uniform ring label (n= 3)
Metabolites that may require further consideration for risk assessment - name and/or code, % of applied (range and maximum)	All [14C]-uniform ring label, n=3 R182281 (SDS-3701) max. 28.3% after 92d (n=3) R417888 max. 15.4% after 63d (n=3) R471811 max. 5.3%after 32d (n=3) SYN507900 (SDS-66882) max. 10.0% after 92d (n=3) R611965 (SDS-46851) max. 7.8% after 32d (n=3) R611966 (SDS-47523) max. 10.7% after 32d (n=3) R613636 (SDS-19221) max 8.6% after 8d 4.8% after 16d (n = 2)

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)	R182281 (SDS-3701) max. 7% AR (moist soil), <5% (dry soil) [^{14}C]-uniform ring label (n = 1)
Mineralisation at study end	6.7% (moist soil), 10.1% (dry soil) [^{14}C]-uniform ring label (n = 1)
Non-extractable residues at study end	27.8% (moist soil), 9.3% (dry soil) [^{14}C]-uniform ring label (n = 1)

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 DT_{50} values for trigger endpoints of chlorothalonil

Parent	Dark aerobic conditions						
Soil type	App. rate [mg/kg]	pH (H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50} (d)	DT_{90} (d)	St. (χ^2)	Method of calculation
Loamy sand (Chamberlain's Farm)	1.0	7.5/6.8	20 / pF2	0.256	1.46	3.78	FOMC, α =1.698; β=0.5073
Sandy clay loam (18 Acres (0.1 mg/kg), from Gibbings & Bramley 2000)	0.1	6.4/5.9	20 / pF2	0.533	1.77	9.54	SFO
Sandy clay loam 18 Acres (1.0 mg/kg , from Gibbings & Bramley 2000)	1.0	6.4/5.9	20 / pF2	1.17	3.89	6.38	SFO
Loam (Gartenacker)	1.29	7.0/6.9	20 / pF2	1.49	4.96	6.73	SFO
Loam (18 Acres, from Gibbings & Bramley 2001)	1.0	6.0/5.4	20 / pF2	0.770	5.04	4.54	FOMC, α =1.393; β=1.194
Sandy loam (ERTC)	1.0	6.7/5.9	20 / pF2	1.12	5.54	6.55	FOMC, α =2.242; β=3.092
Loamy sand (Munster)	1.0	5.6/4.8	20 / pF2	1.79	5.94	6.98	SFO
Silt loam (Malham)	2.5	6.2*	20 / 40% MWHC	2.92	9.68	9.59	SFO

Clay loam (Evesham)	2.5	7.7*	20 / 40% MWHC	1.83	13.9	5.18	FOMC, α =1.173; β=2.267
Sandy clay loam (18 Acres, Green et al, 2015)	1.29	6.0/5.8	20 / pF2	4.65	15.5	5.90	SFO
Silty clay (Marsillargues)	1.29	7.8/7.4	20 / pF2	4.70	15.6	9.43	SFO
Loam/silt loam (White swan)	1.29	5.9/5.7	20 / pF2	3.34	32.9	2.84	FOMC, α =0.93; β=3.021
Sandy loam (Wick)	2.5	5.1*	20 / 40% MWHC	19.0	63.3	9.92	SFO
Loamy sand (Perry, from Duane 1995 study)	1	5.1*	24 / 75% ⅓ bar	1.89	50.1	5.88	FOMC, α =0.5428; β=0.7312
Loamy sand (Speyer 2.2)	2.5	-/6.1	20 / 40% MWHC	9.15	67	4.45	FOMC, α =1.22; β=11.96
Sand (-KBr) (Hamlet)	1	5.6*	24 / 75% ⅓ bar	2.81	48.2	1.52	DFOP, k1 = 0.3751 k2 = 0.0192 g = 0.7477
Sand (+KBr) (Hamlet)	1	5.6*	24 / 75% ⅓ bar	3.25	68.2	1.01	DFOP, k1 = 0.3486 k2 = 0.0152 g = 0.7182
Loamy sand (Perry, from McFadden 1999 study)	1	5.1*	24 / 75% ⅓ bar	2.86	30.7	1.01	DFOP, k1 = 0.3345 k2 = 0.02425 g = 0.7894
Maximum (trigger endpoint)				19.0			
pH dependence					No		

*Medium (H_2O or $CaCl_2$) of pH measurement not recorded.

Parent $DegT_{50}$ values for environmental modelling of chlorothalonil

Parent	Dark aerobic conditions						
Soil type	App. rate [mg/kg]	pH (H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50} /DT_{90} (d)	DT_{50} (d) 20 °C pF2/10kPa	St. (χ^2)	Method of calculation
Loamy sand (Chamberlain's Farm)	1.0	7.5/6.8	20 / pF2	0.256	0.440	3.78	FOMC
Sandy clay loam (18 Acres (0.1 mg/kg), from Gibbings & Bramley 2000)	0.1	6.4/5.9	20 / pF2	0.533	0.533	9.54	SFO
Sandy clay loam 18 Acres (1.0 mg/kg , from Gibbings & Bramley 2000)	1.0	6.4/5.9	20 / pF2	1.17	1.17	6.38	SFO
Geometric mean 18 Acres				0.79	0.79		
Loam (Gartenacker)	1.29	7.0/6.9	20 / pF2	1.49	1.49	6.73	SFO
Loam (18 Acres, from Gibbings & Bramley 2001)	1.0	6.0/5.4	20 / pF2	0.770	1.52	4.54	FOMC
Sandy loam (ERTC)	1.0	6.7/5.9	20 / pF2	1.12	1.67	6.55	FOMC
Loamy sand (Munster)	1.0	5.6/4.8	20 / pF2	1.79	1.79	6.98	SFO
Silt loam (Malham)	2.5	6.2*	20 / 40% MWHC	2.92	2.92	9.59	SFO
Clay loam (Evesham)	2.5	7.7*	20 / 40% MWHC	1.83	3.09	5.18	FOMC
Sandy clay loam (18 Acres, Green et al, 2015)	1.29	6.0/5.8	20 / pF2	4.65	4.65	5.90	SFO
Silty clay (Marsillargues)	1.29	7.8/7.4	20 / pF2	4.70	4.70	9.43	SFO
Loam/silt loam (White swan)	1.29	5.9/5.7	20 / pF2	3.34	7.35	2.84	FOMC
Sandy loam (Wick)	2.5	5.1*	20 / 40% MWHC	19.0	12.9	9.92	SFO
Loamy sand (Perry, from Duane 1995 study)	1	5.1*	24 / 75% ⅓ bar	1.89	19.4	5.88	FOMC

Loamy sand (Speyer 2.2)	2.5	-/6.1	20 / 40% MWHC	9.15	20.2	4.45	FOMC
Sand (-KBr) (Hamlet)	1	5.6*	24 / 75% ⅓ bar	2.81	21.7	1.52	DFOP
Sand (+KBr) (Hamlet)	1	5.6*	24 / 75% ⅓ bar	3.25	27.4	1.01	DFOP
Geometric mean Hamlet				3.02	24.4		
Loamy sand (Perry, from McFadden 1999 study)	1	5.1*	24 / 75% ⅓ bar	2.86	31.6	1.01	DFOP
Geometric mean (if not pH dependent)					**4.29**		
pH dependence					No		

*Medium (H_2O or $CaCl_2$) of pH measurement not recorded.

parent $DegT_{50}$ values for environmental modelling of chlorothalonil metabolites

Parent	Dark aerobic conditions						
Soil type	App. rate [mg/ kg]	pH (H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50} / DT_{90} (d)	DT_{50} (d) 20 °C pF2/10kPa	St. (χ^2)	Method of calculation
Sandy clay loam (18 Acres, 0.1 mg/kg, Gibbings & Bramley 2000)	0.1	6.4/5.9	20 / pF2	0.533/1.77	0.533	9.54	SFO
Sandy clay loam (18 Acres, 1.0 mg/kg, Gibbings & Bramley 2000)	1.0	6.4/5.9	20 / pF2	1.17/3.89	1.17	6.38	SFO
Geometric mean 18 Acres					0.79		
Loam (Gartenacker)	1.29	7.0/6.9	20 / pF2	1.49/4.96	1.49	6.73	SFO
Loamy sand (Munster)	1.0	5.6/4.8	20 / pF2	1.79/5.94	1.79	6.98	SFO
Silt loam (Malham)	2.5	6.2*	20 / 40% MWHC	2.92/9.68	2.92	9.59	SFO
Sandy clay loam (18 Acres, Green et al 2015)	1.29	6.0/5.8	20 / pF2	4.65/15.5	4.65	5.90	SFO
Silty clay (Marsillagues)	1.29	7.8/7.4	20 / pF2	4.70/15.6	4.7	9.43	SFO
Sandy loam (Wick)	2.5	5.1*	20 / 40% MWHC	19.0/63.3	12.9	9.92	SFO
Geometric mean (if not pH dependent)					**2.90**		
pH dependence					No		

*Medium (H_2O or $CaCl_2$) of pH measurement not recorded.

Rate of degradation in soil (aerobic) laboratory studies transformation products (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.1.2 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.1)

R182281	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was Parent						
Soil type	pH (H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50} /DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa	St. (χ^2)	Method of calculation
Loam (18 Acres, Gibbings&Bramley 2001)	6.0/5.4	20 / pF2	38/126	0.096[e]	38	13.4	SFO
Sandy loam (Wick)	5.1*	20 / 40% MWHC	75.3/250	0.140[e]	51.1	17.8	SFO
Loamy sand (Munster)	5.6/4.8	20 / pF2	60.9/202	0.069[e]	60.9	22.7	SFO
Sandy clay loam (18 Acres, Green et al 2015)	6.0/5.8	20 / pF2	78.7/262	0.222[e]	78.7	9.35	SFO
Loam/silt loam (White Swan)	5.9/5.7	20 / pF2	88.5/294	0.106[e]	65.7	15.0	SFO
Sandy clay loam (18 Acres (1.0 mg/kg), Gibbings&Bramley 2000)	6.4/5.9	20 / pF2	67.0/222	0.191[e]	67.0	4.88	SFO
Sandy clay loam (18 Acres (0.1 mg/kg) Gibbings&Bramley 2000)	6.4/5.9	20 / pF2	89.9/299	0.128[e]	89.9	7.41	SFO
Geometric mean 18 Acres					77.6		
Arithmetic mean 18 Acres				0.160			

Clay loam (Evesham)	7.7*	20 / 40% MWHC	122/405	0.222[e]	90.1	6.45	SFO
Sandy loam (ERTC)	6.7/5.9	20 / pF2	92.0/306	0.203[e]	92.0	19.0	SFO
Loamy sand (Perry)	5.1*	24 / 75% ⅓ bar	116/387	0.078[e]	149	6.77	SFO
Loamy sand (Wick)	6.1/-	20 / 40% MWHC	134/444	NA	143	6.91	SFO
Loamy sand (Chamberlain's Farm)	7.5/6.8	20 / pF2	142/472	0.263[e]	142	6.39	SFO
Loam (Gartenacker)	7.0/6.9	20 / pF2	264/877	0.338[e]	264	4.48	SFO
Silt loam (Malham)	6.2*	20 / 40% MWHC	320/>1000	0.127[e]	320	6.12	SFO
Clay loam (Evesham)	7.1/-	20 / 40% MWHC	505/>1000	NA	372	1.17	SFO
Sandy loam (Speyer)	5.3/-	20 / 40% MWHC	436/>1000	NA	436	2.47	SFO
Silty clay (Marsillagues)	7.8/7.4	20 / pF2	489/>1000	0.251[e]	489	3.92	SFO
Loamy sand (Speyer 2.2)	-/6.1	20 / 40% MWHC	609/>1000	0.330[e]	609	7.15	SFO
Geometric mean (if not pH dependent)					**143.9**		
Arithmetic mean				**0.186**			
pH dependence, Yes or No					No		

[e] from chlorothalonil
*Medium (H_2O or $CaCl_2$) of pH measurement not recorded.

R417888	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was Parent						
Soil type	pH (H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50}/DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa	St. (χ^2)	Method of calculation
Sandy clay loam (18 Acres, Emburey 1999)	6.3/5.8	20 / pF2	61.6/205	NA	61.6	5.45	SFO
Sandy loam (Hyde Farm)	7.3/6.7	20 / pF2	62.8/209	NA	62.8	3.73	SFO
Loamy sand (Chamberlain's Farm, Gibbings&Bramley 2001)	7.5/6.8	20 / pF2	65.9/219	0.057 [e]	65.9	12.9	SFO

R417888	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was Parent						
Soil type	pH (H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50}/DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa	St. (χ^2)	Method of calculation
Loam (18 Acres, Gibbings&Bramley 2001)	6.0/5.4	20 / pF2	128/425	0.133 [e]	128	24.3	SFO
Loamy sand (Chamberlain's Farm, Emburey 1999)	6.8/6.0	20 / pF2	129/428	NA	129	4.19	SFO
Sandy clay loam (18 Acres, Green et al 2015)	6.0/5.8	20 / pF2	173/576	0.147 [e]	173	11.0	SFO
Sandy loam (ERTC, Emburey 1999)	5.9/5.3	20 / pF2	200/664	NA	200	2.50	SFO
Silty clay loam (NRTC)	6.7/6.1	20 / pF2	226/751	NA	226	3.53	SFO
Loamy sand (Munster, Emburey 1999)	5.6/4.8	20 / pF2	248/822	NA	248	3.26	SFO
Loam/silt loam (White swan)	5.9/5.7	20 / pF2	425/>1000	0.162 [e]	315	9.14	SFO
Silty clay (Marsillagues)	7.8/7.4	20 / pF2	460/>1000	0.059 [e]	460	14.9	SFO
Loam (Gartenacker)	7.0/6.9	20 / pF2	681/>1000	0.060 [e]	681	24.8	SFO
Sandy clay loam (18 Acres, 0.1 mg/kg, Gibbings&Bramley 2000)	6.4/5.9	20 / pF2	1000/3320	0.102 [e]	1000	19.1	SFO
Sandy clay loam (18 Acres, 1.0 mg/kg, Gibbings&Bramley 2000)	6.4/5.9	20 / pF2	1000/3320	0.092 [e]	1000	9.17	SFO
Geometric mean 18 Acres					1000		
Arithmetic mean 18 Acres				0.097			

R417888	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was Parent						
Soil type	pH (H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50}/DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa	St. (χ^2)	Method of calculation
Sandy loam (ERTC, Gibbings&Bramley 2001)	6.7/5.9	20 / pF2	1000/3320	0.084 [e]	1000	25.6	SFO
Loamy sand (Munster, Gibbings&Bramley 2001)	5.6/4.8	20 / pF2	1000/3320	0.101 [e]	1000	16.2	SFO
Loamy sand (Speyer 2.2)	-/6.1	20 / 40% MWHC	1000/3320	0.178 [e]	1000	29.6	SFO
Silty sand (BBA 2.2)	5.1*	20 / 45% MWHC	>1000/>1000	NA	1000	1.01	SFO
Silty sand (BBA 2.3)	5.7*	20 / 45% MWHC	>1000/>1000	NA	1000	1.01	SFO
Silty sand (BBA 3A)	7.4*	20 / 45% MWHC	>1000/>1000	NA	1000	1.01	SFO
Geometric mean (if not pH dependent)					**332**		
Arithmetic mean				**0.108**			
pH dependence, Yes or No					No		

[e] from chlorothalonil
*Medium (H_2O or $CaCl_2$) of pH measurement not recorded.

R418503	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was Parent						
Soil type	pH (H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50} /DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa	St. (χ^2)	Method of calculation
Loam/silt loam (White Swan)	5.9/5.7	20 / pF2	1000/3320	0.055[e]	>1000	17.6	SFO
Loam (Gartenacker)	7.6/7.2	20 / pF2	3.42/11.4	NA	3.42	3.43	SFO
Sandy clay loam (18 Acres, Green et al 2015)	6.0/5.8	20 / pF2	348/1150	0.031[e]	348	9.98	SFO
Sandy clay loam (18 Acres, Stewart & Ross 2015)	6.0/5.5	20 / pF2	2.96/9.85	NA	2.96	4.51	SFO
Silty clay (Marsillagues)	8.2/7.7	20 / pF2	7.82/26	NA	7.82	8.77	SFO

R418503	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was Parent						
Soil type	pH (H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50} /DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa	St. (χ^2)	Method of calculation
Geometric mean (if not pH dependent)					**30.8**		
Arithmetic mean				**0.043**			
pH dependence, Yes or No					No		

[e] from chlorothalonil

R419492	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was Parent(e), R418503(f) and R417888(g)						
Soil type	pH (H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50}/DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa	St. (χ^2)	Method of calculation
Loamy sand (Chamberlain's Farm)	7.5/6.8	20 / pF2	136/451	0.125[g]	136	15.8	SFO
Sandy clay loam (18 Acres, Embury 1999)	6.3/5.8	20 / pF2	140/466	0.082[g]	140	9.49	SFO
Sandy loam (Hyde Farm)	7.3/6.7	20 / pF2	152/505	0.050[g]	152	7.51	SFO
Loam (Gartenacker)	7.7/7.2	20 / pF2	333/>1000	NA	333	1.90	SFO
Sandy clay loam (18 Acres, Stewart & Abernethy 2014)	6.2/5.5	20 / pF2	367/>1000	NA	367	1.71	SFO
Sandy clay loam (18 Acres, Green et al 2015)	6.0/5.8	20 / pF2	617>1000	0.049 [e] 1.0 [f]	617	7.94	SFO
Silty clay (Marsillagues)	8.2/7.7	20 / pF2	700/>1000	NA	700	1.10	SFO
Sandy loam (ERTC)	6.7/5.9	20 / pF2	1000/3320	1.0 [g]	1000	44.2	SFO
Loamy sand (Munster)	5.6/4.8	20 / pF2	1000/3320	1.0 [g]	1000	27.2	SFO
Geometric mean (if not pH dependent)					**377**		
Arithmetic mean				**0.049[e]** **1.0 [f]** **0.451[gh]**			

R419492	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was Parent(e), R418503(f) and R417888(g)						
Soil type	pH (H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50}/DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa	St. (χ^2)	Method of calculation
pH dependence, Yes or No				No			

[e] from chlorothalonil
[f] from R418503
[g] from R417888
[h] the overall formation fraction for R419492 from R417888 was set to 1 - "fraction to R471811" after overall averaging of endpoints from all studies
*Medium (H_2O or $CaCl_2$) of pH measurement not recorded.

R471811	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was Parent(e), and R417888(f)						
Soil type	pH (H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50}/DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa	St. (χ^2)	Method of calculation
Loam (18 Acres, Gibbings&Bramley 2001)	6.0/5.4	20 / pF2	97.9/325	0.012e 1.00[f]	97.9	6.80	SFO
Sandy loam (Hyde Farm)	7.3/6.7	20 / pF2	245/814	0.906[f]	245	1.68	SFO
Loamy sand (Chamberlain's Farm)	7.5/6.8	20 / pF2	327/>1000	0.687[f]	327	10.8	SFO
Sandy clay loam (18 Acres, Embury 1999)	6.3/5.8	20 / pF2	331/>1000	0.919[f]	331	7.43	SFO
Sandy clay loam (18 Acres, Green et al 2015)	6.0/5.8	20 / pF2	1000/3320	0.027[e] 0.349[f]	1000	17.4	SFO
Loam (Gartenacker)	7.9/7.3	20 / pF2	>1000/>1000	NA	1000	1.80	SFO
Sandy clay loam (18 Acres, Wicksted et al 2015)	6.0/5.6	20 / pF2	>1000/>1000	NA	1000	1.52	SFO
Silty clay (Marsillagues)	8.3/7.7	20 / pF2	>1000/>1000	NA	1000	1.89	SFO
Sandy loam (ERTC)	5.9/5.3	20 / pF2	1000/3320	0.656[f]	1000	7.56	SFO
Loamy sand (Munster)	5.6/4.8	20 / pF2	1000/3320	0.658[f]	1000	8.29	SFO

R471811	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was Parent(e), and R417888(f)						
Soil type	pH (H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50}/DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa	St. (χ^2)	Method of calculation
Silty clay loam (NRTC)	6.7/6.1	20 / pF2	1000/3320	0.951[f]	1000	9.14	SFO
Geometric mean (if not pH dependent)					**582**		
Arithmetic mean				**0.020[e]** **0.766[f]**			
pH dependence, Yes or No					No		

[e] from chlorothalonil
[f] from R417888

SYN507900	Dark aerobic conditions Metabolite dosed						
Soil type	pH (H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50}/DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa	St. (χ^2)	Method of calculation
Loam (Gartenacker)	7.6/7.2	20 / pF2	61.6/205	NA	61.6	2.99	SFO
Sandy clay loam (18 Acres)	6.0/5.5	20 / pF2	74.7/403	NA	142	4.78	DFOP
Silty clay (Marsillagues)	8.2/7.7	20 / pF2	355/>1000	NA	666	1.30	DFOP
Geometric mean (if not pH dependent)					**180**		
Arithmetic mean				**1[e]**			
pH dependence, Yes or No					No		

[e] default in the absence of reliable estimate

R611965	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was Parent(e), R611966(f)						
Soil type	pH (H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50}/DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa	St. (χ^2)	Method of calculation
Loam (Gartenacker)	7.0/6.9	20 / pF2	36.6/122	0.074[e]	36.6	26.0	SFO
Silty clay (Marsillagues)	7.8/7.4	20 / pF2	155/516	0.074[e]	155	18.5	SFO
Loam/silt loam (White Swan)	5.9/5.7	20 / pF2	164/544	0.036[e] 0.783[f]	122	7.16	SFO
Silty sand (BBA 3A)	7.4*	20 / pF2	279/925	NA	279	1.01	SFO
Sandy clay loam (18 Acres)	6.0/5.8	20 / pF2	450/1490	0.058[e]	450	7.67	SFO
Silty sand (BBA 2.3)	5.7*	20 / pF2	774/2570	NA	774	1.01	SFO
Silty sand (BBA 2.2)	5.1*	20 / pF2	964/3200	NA	964	1.01	SFO
Loamy sand (Perry, Duane 1995)	5.1*	24 / 75% ⅓ bar	1000/3320	0.125[e] 1.00[f]	1000	23.5	SFO
Loamy sand (Perry, McFadden 1999)	5.1*	24 / 75% ⅓ bar	1000/3320	0.0415[e] 1.00[f]	1000	6.9	SFO
Sand (Hamlet, -KBr)	5.6*	24 / 75% ⅓ bar	1000/3320	0.0096[e] 1.00[f]	1000	13.8	SFO
Geometric mean (if not pH dependent)					**381**		
Arithmetic mean				**0.060[e]** **0.946[f]**			
pH dependence, Yes or No					No		

[e] from chlorothalonil
[f] from R611966
*Medium (H_2O or $CaCl_2$) of pH measurement not recorded.

R611966	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was Parent						
Soil type	pH (H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50}/DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa	St. (χ^2)	Method of calculation
Loamy sand (Perry+KBr, McFadden1999)	5.1*	24 / 75% ⅓ bar	16.8/55.9	0.130	18.6	4.4	SFO
Loam/silt loam (White Swan)	5.9/5.7	20 / pF2	28.6/95	0.076	21.2	17.8	SFO
Sand (Hamlet-KBr)	5.6*	24 / 75% ⅓ bar	73.5/244	0.082	44.2	3.97	SFO
Loam (Gartenacker)	7.0/6.9	20 / pF2	156/519	0.027	156	14.8	SFO
Loamy sand (Perry, Duane 1995)	5.1*	24 / 75% ⅓ bar	37.7/>1000	0.080	885	5.92	DFOP, K_1=0.07376; K_2=0.001004; g=0.514
Geometric mean (if not pH dependent)					**75.2**		
Arithmetic mean				**0.079**			
pH dependence, Yes or No					No		

*Medium (H_2O or $CaCl_2$) of pH measurement not recorded.

R611967	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was Parent						
Soil type	pH(H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50}/DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa[b)]	St. (χ^2)	Method of calculation
Sand (Hamlet+KBr)	5.6*	24 / 75% ⅓ bar	16.4/54.4	0.140	9.86	5.67	SFO
Sand (Hamlet-KBr)	5.6*	24 / 75% ⅓ bar	13.6/45.2	0.155	8.18	4.66	SFO
Geometric mean Hamlet soil					8.98		
Arithmetic mean Hamlet soil				0.138			
Loamy sand (Perry, McFadden 1999)	5.1*	24 / 75% ⅓ bar	14.6/48.6	0.155	16.2	6.79	SFO
Loamy sand (Perry, Duane 1995)	5.1*	24 / 75% ⅓ bar	5.08/237	0.158	128	11.80	DFOP, K_1=0.9573 K_2=0.0069; g=0.4861
Geometric mean (if not pH dependent)					**26.5**		
Arithmetic mean				**0.154**			

R611967	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was Parent						
Soil type	pH(H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50}/DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa[b)]	St. (χ^2)	Method of calculation
pH dependence, Yes or No					No		

*Medium (H_2O or $CaCl_2$) of pH measurement not recorded.

R611968	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was Parent						
Soil type	pH (H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50}/DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa[b)]	St. (χ^2)	Method of calculation
Sandy clay loam (18 Acres (1.0 mg/kg), Gibbings&Bramley 2000)	6.4/5.9	20 / pF2	3.34/11.1	0.115	3.34	26.3	SFO
Sandy clay loam (18 Acres (0.1 mg/kg), Gibbings&Bramley 2000)	6.4/5.9	20 / pF2	9.71/32.3	0.073	9.71	1.01	SFO
Geometric mean 18 Acres					5.69		
Arithmetic mean 18 Acres				0.094			
Loamy sand (Perry)	5.1*	24 / 75% ⅓ bar	416/>1000	0.039	534	8.12	SFO
Geometric mean (if not pH dependent)					**55.1**		
Arithmetic mean				**0.067**			
pH dependence, Yes or No					No		

*Medium (H_2O or $CaCl_2$) of pH measurement not recorded.

R613636	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was Parent						
Soil type	pH(H_2O/ $CaCl_2$)	t. °C / % MWHC	DT_{50}/DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa[b)]	St. (χ^2)	Method of calculation
Loam (Gartenacker, Wicksted et al 2014)	7.9/7.3	20 / pF2	11.4/37.7	NA	11.4	7.14	SFO
Sandy clay loam (18 Acres)	6.1/5.6	20 / pF2	17.1/56.8	NA	17.1	8.51	SFO
Loamy sand (Speyer 2.2)	-/6.1	20 /40% MWHC	29.5/98	0.107	29.5	20.7	SFO
Loam (Gartenacker, Green et al 2015)	7.0/6.9	20 / pF2	29.6/98.4	0.104	29.6	12.9	SFO
Silt loam (Malham)	6.2*	20 /40% MWHC	29.8/98.9	0.098	29.8	29.2	SFO
Silty clay (Marsillagues, Wicksted et al 2014)	8.3/7.7	20 / pF2	45.2/150	NA	45.2	5.61	SFO
Clay loam (Evesham)	7.7*	20 /40% MWHC	77.6/258	0.084	57.3	26.8	SFO
Silty clay (Marsillagues, Green et al 2015)	7.8/7.4	20 / pF2	106/354	0.061	106	9.86	SFO
Geometric mean (if not pH dependent)					**33.0**		
Arithmetic mean				**0.091**			
pH dependence, Yes or No					No		

*Medium (H_2O or $CaCl_2$) of pH measurement not recorded.

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).	App. rate [kg/ha]	pH[a)]	Depth (cm)	DT_{50} (d) actual	DT_{90}(d) actual	St. (χ^2)	DT_{50} (d) Norm[b)].	Method of calculation
Sandy clay loam (bare)	Italy	3.6	5.9 [$CaCl_2$]	50	7.44	24.7	20.1	NA	SFO
Loamy sand (bare)	Germany	3.6	5.7 [$CaCl_2$]	50	28.4	94.2	22.8	NA	SFO

Parent	Aerobic conditions								
Soil type (indicate if bare or cropped soil was used).	Location (country or USA state).	App. rate [kg/ha]	pH[a)]	Depth (cm)	DT_{50} (d) actual	DT_{90}(d) actual	St. (χ^2)	DT_{50} (d) Norm[b)].	Method of calculation
Geometric mean (if not pH dependent)								NA	
pH dependence, Yes or No					No				

[a)] Measured in calcium chloride solution
[b)] not applicable

R182281	Aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was parent
	No reliable dissipation endpoint could be derived

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)	Not relevant	
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. This dossier was submitted April 30th, 2015.

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	**Study 1: Germany (two sites)** Application of 12 kg/ha (potatoes, year 1), 2.2 kg/ha (winter wheat, years 2 and 3) in field studies. No accumulation of chlorothalonil, R182281 or R417888 at the end of the 3 year period.
	Study 2: France (one site) Application of 6 kg/ha (per year for 5 years, carrots and tomatoes in rotation) in field studies. No accumulation of chlorothalonil or R417888 at the end of the 5 year period. Accumulation of R182281 was observed but no plateau was reached.
	Study 3: Spain (one site) Application of 6 kg/ha (per year for 5 years, cucurbits and tomatoes in rotation) in field studies. No accumulation of chlorothalonil or R417888 at the end of the 5 year period. Accumulation of R182281 was observed but no plateau was reached
	Study 4: Italy (one site) Application of 6 kg/ha (per year for 5 years, cucurbits and tomatoes in rotation) in field studies. No accumulation of chlorothalonil or R417888 at the end of the 5 year period. Accumulation of R182281 was observed but no plateau was reached.
	Study 5: Netherlands (one site) Application of 12 kg/ha (potatoes, year 1), 2.2 kg/ha (winter wheat, years 2 and 3) in field studies. No accumulation of chlorothalonil at the end of the 3 year period. Accumulation of R182281 was observed with an apparent plateau of approximately 0.35 kg/ha.

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)

	Study 6: Italy, Germany (two sites) Application of 3.6 kg/ha (per year for 4 years, bare soil) in field studies. No accumulation of chlorothalonil at the end of the 4 year period – both sites. Accumulation of R182281 was observed with an apparent plateau of approximately 0.04 and 0.11 kg/ha in top 10 cm at the Italy and German sites respectively. R417888 residues not detected at Italy site, remained between 0.01 to 0.03 mg/kg throughout the study at German site – no evidence of accumulation. R611965 (SDS-46851) residues not detected at either site.

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	App. rate [mg/kg]	pH[a)]	t. °C	DT_{50} / DT_{90} (d)	DT_{50} (d) 20 °C[b)]	St. (χ^2)	Method of calculation
Sandy clay loam (18 Acres)	1.43	5.8	20	2.6/>1000	8.9	8.8(persistence)/ 13.0 (modelling)	DFOP(persistence) FOMC (modelling)
Silty clay (Marsillagues)	1.43	7.4	20	3.7/109	5.0	12.2(persistence)/ 16.8(modelling)	DFOP(persistence) SFO(modelling)
Loam/silt loam (White Swan)	1.43	5.7	20	4.2/73.5	22.1	4.8	FOMC (persistence & modelling)
Geometric mean (if not pH dependent)					3.4		

a) Measured in calcium chloride solution
b) Normalised using a Q10 of 2.58

Rate of degradation in soil (anaerobic) laboratory studies transformation products (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.1.4 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.1)

Metabolites	Dark anaerobic conditions
	Degradation rates of metabolite under anaerobic conditions were not determined.

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	pH[a)]	t. °C / % MWHC	DT_{50} / DT_{90} (d) calculated at 30-50 °N	St. (χ^2)	Method of calculation
Loam (moist)	7.3 ($CaCl_2$)	20	40.3 / 133.6	2.3	SFO
Loam (dry)	7.3 ($CaCl_2$)	20	124.8 / 414.4	2.3	SFO

a) Measured in calcium chloride solution

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	Soil pH (H_2O/ $CaCl_2$)	OC %	K_d (mL/g)	K_{oc} (mL/g)	K_F (mL/g)	K_{Foc} (mL/g)	1/n
Clay loam (Kirkpatrick and Aikens 1996b)	8.2/nr	2.1	nr	nr	6.98	330	0.86
Loamy sand (Kirkpatrick and Aikens 1996b)	6.9/nr	2.4	nr	nr	9.40	390	0.95
Sand (Naples, Capps 1982)	6.8/6.8	0.4	nr	nr	3	850	0.753
Sandy loam (Kirkpatrick and Aikens 1996b)	5.1/nr	0.7	nr	nr	6.30	900	0.83
Loam (Gartenacker)	7.0/6.9	2.6	33	1303	27.10	1042	0.91
Sandy loam (Perry, Capps 1982)	5.9/5.7	1.9	nr	nr	20	1100	0.944
Silty clay loam (Painesville, Capps 1982)	6.6/6.6	1.9	nr	nr	26	1400	0.792
Sandy clay loam (18 Acres)	6.0/5.8	2.3	37	1617	32.40	1409	0.94
Silt loam (White Swan)	5.9/5.7	1.7	57	3357	46.77	2751	0.91
Sandy loam (North Dakota)	7.8/nr	2.5	153	6154	74.13	2965	0.75
Silty clay (Marsillargues)	7.8/7.4	1.0	56	5620	45.59	4559	0.91
Silt (Lake county, Capps 1982)	7.6/7.5	0.4	nr	nr	29	7000	0.833
Geometric mean (if not pH dependent)					**19.3**	**1403**	
Arithmetic mean (if not pH dependent)							**0.87**
pH dependence			No				

nr = not reported

Soil adsorption transformation products (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.3.1.2 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.2.1)

R182281							
Soil Type	Soil pH (H_2O/ $CaCl_2$)	OC %	K_d (mL/g)	K_{oc} (mL/g)	K_F (mL/g)	K_{Foc} (mL/g)	1/n
Sandy loam (California) (Archer & Doran, 1991)	nr/6.5	0.46	nr	nr	1.17	250	0.89
Silty loam (Tennessee) (Archer & Doran, 1991)	nr/6.6	0.58	nr	nr	1.46	250	0.89
Loam (California) (Archer & Doran, 1991)	nr/6.1	0.35	nr	nr	1.07	300	0.89
Loamy sand (Speyer 2.2) (Aikens&Hobbs, 1996)	nr/6.1	2.5	nr	nr	8.77	351	0.87

Silty clay loam (New Philadelphia) (Archer & Doran, 1991)	nr/7.2	1.04	nr	nr	3.98	380	0.81
Aquatic sed (Kellogg Creek) (Archer & Doran, 1991)	nr/7.2	0.7	nr	nr	3.44	490	0.78
Clay loam (Evesham 3) (Aikens&Hobbs, 1996)	nr/7.1	1.9	nr	nr	10.6	559	0.91
Sandy loam (Wick) (Aikens&Hobbs, 1996)	nr/5.1	0.7	nr	nr	5.03	718	0.96
Geometric mean (if not pH dependent)					**3.2**	**386**	
Arithmetic mean (if not pH dependent)							**0.88**
pH dependence			No				

nr = not reported

R417888							
Soil Type	Soil pH (H_2O/ $CaCl_2$)	OC (%)	K_d (mL/g)	K_{oc} (mL/g)	K_F (mL/g)	K_{Foc} (mL/g)	1/n
Loamy sand (Munster) (Thomas 1999)	5.8/5.1	2.10	0.14	7	0.12	5.7	0.9
Sandy loam (Rocky Mount, ERTC) (Thomas 1999)	5.3/4.8	0.29	0.05	17	0.05	17.2	1.06
Sandy loam (18 Acres) (Thomas 1999)	7.4/6.8	1.8	0.11	6	0.10	5.6	0.92
Sandy loam (Kenny Hill) (Thomas 1999)	8.5/7.5	3.0	0.22	7	0.22	7.4	1.02
Silty clay (Champaign, NRTC) (Thomas 1999)	5.6/5.1	2.0	0.28	14	0.27	13.3	0.98
Loamy sand (Chamberlain's Farm) (Thomas 1999)	8.0/7.6	1.0	0.11	11	0.11	11.2	1.08
Loamy sand (BBA 2.2) (Morlock 2005c)	nr/5.4	1.97	0.14	6.9	0.13	6.5	1.03
Loamy sand (BBA 2.3) (Morlock 2005c)	nr/5.7	0.86	≤0.02	≤2.3	0.041	0**	0.9*
Sandy loam (BBA 3A) (Morlock 2005c)	nr/7.3	2.42	0.13	5.5	0.11	4.6	1.05
Sandy loam (Speyer 2.2) (Volkel 2007a)	nr/5.7	2.29	nr	nr	0.36	16.0	1.11
Loam (Mechtildshausen)	nr/6.8	1.36	nr	nr	0.17	13.0	1.81[a]

(Volkel 2007a)							
Clay (Speyer 6S) (Volkel 2007a)	nr/6.9	1.90	nr	nr	0.25	13.0	0.82
Geometric mean (if not pH dependent)					**0.13**	**9.5*** **	
Arithmetic mean (if not pH dependent)							**1.01**
pH dependence			No				

[a] Highest acceptable value for FOCUS-PEARL model (1.3) used in calculation of arithmetic mean
[*] Default Freundlich exponent value of 0.9 used as not possible to calculate a 1/n value over concentration range due to low adsorption (FOCUS, 2014).
nr = not reported
** sorption negligible, for risk assessment a value of 0 should be used
*** since the data set contains 0, the arithmetic mean is calculated instead of the geometric mean

R418503							
Soil Type	Soil pH (H_2O/ $CaCl_2$)	OC %	K_d (mL/g)	K_{oc} (mL/g)	K_F (mL/g)	K_{Foc} (mL/g)	1/n
Loam (Gartenacker)	7.7/7.2	1.9	0.09	4.5	0.05	2.0	0.65
Sandy clay loam (18 Acres)	6.2/5.5	2.5	0.12	4.8	0.11	4.0	1.01
Silty clay (Marsillargues)	8.2/7.7	1.0	<0.04	<4	<0.04[a]	0[b]	0.9*
Sandy Loam (North Dakota)	7.7/7.3	2.5	<0.04	<2	0.02	0[b]	0.9*
Loam (White Swan)	6.4/6.1	1.2	<0.04	<3	<0.04[a]	0[b]	0.9*
Geometric mean (if not pH dependent)						**2.0** **	
Arithmetic mean (if not pH dependent)							**0.87**
pH dependence			No				

[a] Kd value reported
[b]sorption negligible, for risk assessment a value of 0 should be used
[*] Default Freundlich exponent value of 0.9 used as not possible to calculate a 1/n value over concentration range due to low adsorption (FOCUS, 2014).
** since the data set contains K(F)oc values of 0 L/kg, no geometric mean could be calculated. Instead the arithmetic mean is used for further assessment

R419492							
Soil Type	Soil pH (H_2O/ $CaCl_2$)	OC %	K_d (mL/g)	K_{oc} (mL/g)	K_F (mL/g)	K_{Foc} (mL/g)	1/n
Sandy clay loam (18 Acres)	6.2/5.5	2.5	<0.04	<1.6	<0.04[a]	0[b]	0.9*
Sandy Loam (North Dakota)	7.7/7.3	2.5	<0.04	<1.6	<0.04[a]	0[b]	0.9[*]
Loam (Gartenacker)	7.7/7.2	1.9	<0.04	<2.1	<0.04[a]	0[b]	0.9[*]
Loam (White Swan)	6.4/6.1	1.2	<0.04	<3.3	<0.04[a]	0[b]	0.9[*]
Silty clay (Marsillargues)	8.2/7.7	1.0	<0.04	<4.0	<0.04[a]	0[b]	0.9[*]
Geometric mean (if not pH dependent)					**0**	**0** **	
Arithmetic mean (if not pH dependent)							**0.9**

pH dependence	No

[a] Kd value reported
[b] sorption negligible, for risk assessment a value of 0 should be used
*Default Freundlich exponent value of 0.9 used as not possible to calculate a 1/n value over concentration range due to low adsorption (FOCUS 2014)[1]
** since the data set contains K(F)oc values of 0 L/kg, no geometric mean could be calculated. Instead the arithmetic mean is used for further assessment

R471811							
Soil Type	Soil pH (H_2O/ $CaCl_2$)	OC %	K_d (mL/g)	K_{oc} (mL/g)	K_F (mL/g)	K_{Foc} (mL/g)	1/n
Sandy clay loam (18 Acres)	6.2/5.5	2.5	<0.03	<1.2	<0.03[a]	0[b]	0.9*
Sandy Loam (North Dakota)	7.7/7.3	2.5	<0.03	<1.2	<0.03[a]	0[b]	0.9*
Loam (Gartenacker)	7.7/7.2	1.9	<0.03	<1.6	<0.03[a]	0[b]	0.9*
Loam (White Swan)	6.4/6.1	1.2	<0.03	<2.5	<0.03[a]	0[b]	0.9*
Silty clay (Marsillargues)	8.2/7.7	1.0	<0.03	<3.0	<0.03[a]	0[b]	0.9*
Geometric mean (if not pH dependent)					**0**	**0***	
Arithmetic mean (if not pH dependent)							**0.9**
pH dependence			No				

[a] Kd value reported
[b] sorption negligible, for risk assessment a value of 0 should be used
*Default Freundlich exponent value of 0.9 used as not possible to calculate a 1/n value over concentration range due to low adsorption (FOCUS 2014)[1]
** since the data set contains K(F)oc values of 0 L/kg, no geometric mean could be calculated. Instead the arithmetic mean is used for further assessment

SYN507900							
Soil Type	Soil pH (H_2O/ $CaCl_2$)	OC %	K_d (mL/g)	K_{oc} (mL/g)	K_F (mL/g)	K_{Foc} (mL/g)	1/n
Loam (Gartenacker)	7.7/7.2	1.9	0.17	9	0.21	11	1.20
Loam (White Swan)	6.4/6.1	1.2	0.19	16	0.17	14	0.94
Sandy clay loam (18 Acres)	6.2/5.5	2.5	0.28	11	0.37	15	1.21
Silty clay (Marsillargues)	8.2/7.7	1.0	0.12	12	0.19	19	1.18
Sandy Loam (North Dakota)	7.7/7.3	2.5	0.32	13	0.55	22	1.26
Geometric mean (if not pH dependent)					**0.27**	**15.74**	
Arithmetic mean (if not pH dependent)							**1.16**
pH dependence			No				

R611965							
Soil Type	Soil pH	OC %)	K_d	K_{oc}	K_F	K_{Foc}	1/n

	(H_2O/ $CaCl_2$)		(mL/g)	(mL/g)	(mL/g)	(mL/g)	
Silty clay loam (New Philadelphia)	nr/7.1	0.93	nr	nr	0.714	77	1.07
Loamy sand (BBA 2.2)	nr/5.4	1.97	0.05	2.5	0.063	3.18	1.13
Loamy sand (BBA 2.3)	nr/5.7	0.86	0.02	2.3	0.02[a]	0[b]	0.9*
Sandy loam (BBA 3A)	nr/7.3	2.42	0.17	7.0	0.1	4.14	0.753
Sandy loam (Speyer 2.2)	nr/5.7	2.29	nr	nr	0.15	7	0.82
Loam (Mechtildshausen)	nr/6.8	1.36	nr	nr	0.184	14	0.87
Clay (Speyer 6S)	nr/6.9	1.90	nr	nr	0.076	4	0.56
Geometric mean (if not pH dependent)					**0.17****	**15.62****	
Arithmetic mean (if not pH dependent)							**0.87**
pH dependence			No				

[a] Kd value reported
[b] sorption negligible, for risk assessment a value of 0 should be used
*Default Freundlich exponent value of 0.9 used as not possible to calculate a 1/n value over concentration range due to low adsorption (FOCUS 2014)[1]
** since the data set contains K(F)oc values of 0 L/kg, no geometric mean could be calculated. Instead the arithmetic mean is used for further assessment

R613636							
Soil Type	Soil pH (H_2O/ $CaCl_2$)	OC %	K_d (mL/g)	K_{oc} (mL/g)	K_F (mL/g)	K_{Foc} (mL/g)	1/n
Loam (Gartenacker)	7.7/7.2	1.9	3.51	185	2.48	130	0.81
Loam (White Swan)	6.4/6.1	1.2	4.51	376	3.68	307	0.89
Sandy clay loam (18 Acres)	6.2/5.5	2.5	7.03	282	5.93	237	0.91
Silty clay (Marsillargues)	8.2/7.7	1.0	2.87	287	2.32	232	0.88
Sandy Loam (North Dakota)	7.7/7.3	2.5	11.43	453	8.13	325	0.86
Geometric mean (if not pH dependent)					**4.00**	**234.7**	
Arithmetic mean (if not pH dependent)							**0.87**
pH dependence			No				

R611966							
Soil Type	Soil pH ($CaCl_2$)	OC %	K_d (mL/g)	K_{oc} (mL/g)	K_F (mL/g)	K_{Foc} (mL/g)	1/n
Loam (Gartenacker)	6.1	1.9	-	-	7.40	389	1.07
Loam (White Swan)	6.6	1.2	-	-	8.16	680	1.09
Sandy clay loam (18 Acres)	6.0	2.2	-	-	8.67	394	1.05
Silty clay (Marsillargues)	7.7	1.0	-	-	9.11	911	1.16
Sandy Loam (North Dakota)	7.3	2.5	-	-	18.07	723	0.98
Geometric mean (if not pH dependent)						**585**	
Arithmetic mean (if not pH dependent)							**1.07**

pH dependence	No

R611967							
Soil Type	Soil pH ($CaCl_2$)	OC %	K_d (mL/g)	K_{oc} (mL/g)	K_F (mL/g)	K_{Foc} (mL/g)	1/n
Loam (Gartenacker)	7.2	1.9	-	-	6.32	333	1.04
Loam (White Swan)	6.1	1.2	-	-	5.22	435	0.96
Sandy clay loam (18 Acres)	6.0	2.2	-	-	4.67	212	0.98
Silty clay (Marsillargues)	7.7	1.0	-	-	11.21	1121	1.23
Sandy Loam (North Dakota)	7.3	2.5	-	-	8.92	357	1.03
Geometric mean (if not pH dependent)						**415**	
Arithmetic mean (if not pH dependent)							**1.05**
pH dependence			No				

R611968							
Soil Type	Soil pH ($CaCl_2$)	OC %	K_d (mL/g)	K_{oc} (mL/g)	K_F (mL/g)	K_{Foc} (mL/g)	1/n
Loam (White Swan)	6.6	1.2	-	-	0.61	51	1.00
Sandy clay loam (18 Acres)	6.0	2.2	-	-	1.26	57	0.98
Silty clay (Marsillargues)	7.7	1.0	-	-	1.28	128	1.17
Sandy Loam (North Dakota)	7.3	2.5	-	-	2.56	102	0.91
Geometric mean (if not pH dependent)						**78**	
Arithmetic mean (if not pH dependent)							**1.02**
pH dependence			No				

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 required

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 required

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	Location: Munster, Germany Study type (e.g. lysimeter, field): Lysimeter Soil properties: Texture: Loamy sand pH = 5.6 – 5.8 OC = 1.32 – 0.05 Dates of application : June 1995 Crop : /Interception estimated: Winter wheat / 70% Number of applications: 1 year, 2 applications per year – 1st application - 985 g/ha 2nd application – 988 g/ha Duration. 2 years Annual rainfall (mm): 920 mm (year 1), 900 mm (year 2) Annual leachate volume (mm): 391/433 mm (year 1), 315/318 mm (year 2) Chlorothalonil and R182281 (SDS-3701); R613636 (SDS-19221); R611966 (SDS-47523); R611967 (SDS-47524); R611968 (SDS-47525); SYN507900 (SDS-66882) and R613842 (SDS-67042) were not detected in the leachate Individual annual maximum concentrations: R417888 24 %AR (year 1) R419492 11 %AR (year 1) Individual annual average concentrations: R417888 9.3 µg/L (year 1), 7.4 µg/L (year 2) R419492 4.4 µg/L (year 1) At least 5 unidentifed metabolites >0.1 µg/L Amount of radioactivity in the soils at the end of the study = 28/24% AR – no parent;
	Location: Borstel, Germany Study type (e.g. lysimeter, field): Lysimeter Soil properties (0-30 cm): Texture: Sandy loam pH [KCl] = 6.18 OC = 1.43% MWHC = 45% Dates of application : June 2005 Crop : /Interception estimated: Wheat, 1st app. at BBCH 31, 2nd app. BBCH 65 (16 days after first app.) Number of applications: 1 year, 2 applications per year Duration: 2 years Application rate: 2500 g/ha/year (1250 g/app.) Annual rainfall (mm): 1024 mm (year 1), 1073 mm (year 2) Average annual leachate volume (mm): 555 mm

	% radioactivity in leachate (maximum/year): 8.3% AR (year 1), 2.5% AR (year 2) Individual annual maximum concentrations (parent equivalents): No parent or R182281 detected R417888 (M12) – 31.14 µg/L (year 1), 3.98 µg/L (year 2) R418503 (M13) – 3.38 µg/L (year 1), 1.97 µg/L (year 2) R419492(M8) – 14.20 µg/L (year 1), 1.74 µg/L (year 2) R471811 (M4) – 7.87 µg/L (year 1), 2.56 µg/L (year 2) SYN548008 (M3) – 17.18 µg/L (year 1), 1.51 µg/L (year 2) SYN548580 (M2) – 2.22 µg/L (year 1), 1.57 µg/L (year 2) SYN548581 (M11) – 0.35 µg/L (year 1), 0.3 µg/L (year 2) R611965 (M5) – 4.93 µg/L (year 1), 0.42 µg/L (year 2) R611968 (M9) – 1.83 µg/L (year 1), 2.47 µg/L (year 2) R613636 (M14) – <0.01 µg/L (year 1), 0.74 µg/L (year 2) M7 – 4.61 µg/L (year 1), 1.00 µg/L (year 2) M10 – 1.27 µg/L (year 1), 1.05 µg/L (year 2) Unidentified radioactivity, max. 42.92 µg/L (year 1), 14.10 µg/L (year 2) Individual annual average concentrations (parent equivalents): No parent or R182281 detected R417888 (M12) – 7.5 µg/L (year 1), 0.9 µg/L (year 2) R418503 (M13) – 1.5 µg/L (year 1), 0.6 µg/L (year 2) R418492 (M8) – 3.3 µg/L (year 1), 0.4 µg/L (year 2) R471811 (M4) – 1.9 µg/L (year 1), 0.4 µg/L (year 2) SYN548008 (M3) – 3.7 µg/L (year 1), 0.4 µg/L (year 2) SYN548580 (M2) – 0.5 µg/L (year 1), 0.1 µg/L (year 2) SYN548581 (M11) – 0.1 µg/L (year 1), <0.1 µg/L (year 2) R611965 (M5) – 1.3 µg/L (year 1), <0.1 µg/L (year 2) R611968 (M9) – 0.6 µg/L (year 1), 0.7 µg/L (year 2) R613636 (M14) – <0.1 µg/L (year 1), 0.2 µg/L (year 2) M7 – 1.2 µg/L (year 1), 0.2 µg/L (year 2) M10 – 0.5 µg/L (year 1), 0.2 µg/L (year 2) Unidentified radioactivity, 11.39 µg/L (year 1), 5.79 µg/L (year 2) Amount of radioactivity in the soils at the end of the study = 32% AR; no parent detected and only trace amounts of R182281 (max. 0.006 mg/kg)

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°C): no hydrolysis
	pH 7 (50°C): DT_{50} 29.7 days (n=1) pH 7 (60°C): DT_{50} 6.9 days (n=1) pH 7 (70°C): DT_{50} 2.1 days (n=1) Degradates: R613636: max. 47.8% AR (60°C) SYN546872: max. 37.4% AR (70°C) R182281: max. 31.3% AR (70°C) R182281 [isomer 1]: max. 5.0% AR (60°C) R182281 [isomer 2]: max. 5.1% AR (70°C)
	pH 9 DT_{50} (15°C) – 83.5 days (n=1) pH 9 DT_{50} (25°C) – 9.5-11.5 days (n=2) pH 9 DT_{50} (35°C) – 3.9 days (n = 1) DT_{50} (50°C) – 0.61 days (n=1) Degradates: R613636: max 70.6% (50°C) SYN546872: max. 19.3% AR (35°C) R182281: max. 29.8% AR (35°C) R182281 [isomer 1]: max.5.8% AR (25°C) R182281 [isomer 2]: max. 10.2% AR (25°C)

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 %	**pH 7, sterile buffer** DT_{50}: 0.48 – 0.96 day (12 hour day, 30-50°N) (n=2) Degradates (not necessarily from the same study): R613801 (MM230, Trichloro-1,3-dicyanobenzene): max. 13.9%, DT_{50} 0.36 d SYN546934 (MM196, Dichloro-1,3-dicyano-benzene) : max. 9.4%, DT_{50} 1.16 d PD1 (R613911) max. 53.2% PD2 (R613801) max. 34.4% PD3 (Chloro-trihydroxybenzene-1,3-dicarbonitrile)* max. 14.4% PD4 (Dichloro-dihydroxybenzene-1,3-dicarbonitrile)* max. 3.3% **Natural water** DT_{50}: 0.21 – 0.35 day (12 hour day, 30-50°N) (n=2) Degradates (not necessarily from the same study): PD1 (R613911) max. 12.2% PD2 (R613801) max. 20.5% PD4 (Dichloro-dihydroxybenzene-1,3-dicarbonitrile)* max. 19.9% PD5 (SYN549430) max. 32.7% *structure not confirmed
Quantum yield of direct phototransformation in water at Σ > 290 nm	0.00124 molecules degraded $photon^{-1}$

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

Readily biodegradable (yes/no)	no

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	t. $^{o}C^{a)}$	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 20 $^{o}C^{b)}$		At study temp	Normalised to x $^{o}C^{c)}$		
Fresh water – 10 µg/L	8.58	NA	20	NA	NA	NA	0.4 / 1.4	NA	10.7	SFO
Fresh water – 50 µg/L	8.48	NA	20	NA	NA	NA	6.0 / 21	NA	4.8	SFO

a) Temperature of incubation=20°C

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 persistence endpoints	Distribution Max. in water 92% AR - Max. sediment 8.8 % AR									
Water / sediment system	pH water phase	pH sed	t. ^{o}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
Houghton Meadow	6.7	7.3	20	0.061/3.97	12.6	0.512/2.06	10.5	NA	NA	DFOP
Bury Pond	5.5	8.0	20	0.011/2.25	14.6	0.0105/1.17	15.4	NA	NA	DFOP
Emperor Lake	5.6	7.4	20	2.38/7.92	2.80	2.38/7.92	2.80	NA	NA	SFO
Bury Pond	7.4	7.9	20	0.753/2.5	12.9	0.753/2.5	12.9	NA	NA	SFO
Calwich Abbey	7.6	7.4	20	3.33/11.1	6.89	3.23/10.7	8.06	NA	NA	SFO
Swiss Lake	7.3	5.3	20	8.9/29.7	7.93	9.48/31.5	10.2	NA	NA	SFO
Geometric mean at 20^{o}C				0.57/6.14		0.82/4.96				
Maximum				8.9/29.7		9.48/31.5				

Parent Modelling endpoints	Distribution Max. in water 92% AR - Max. sediment 8.8 % AR									
Water / sediment	pH	pH	t. ^{o}C	DT_{50} / DT_{90}	St.	DT_{50} / DT_{90}	St.	DT_{50} / DT_{90}	St.	Method of

system	water phase	sed		whole sys.	(χ^2)	water	(χ^2)	sed	(χ^2)	calculation
Houghton Meadow	6.7	7.3	20	1.20/-	12.6	0.620/-	10.5	NA	NA	DFOP
Bury Pond	5.5	8.0	20	0.678/-	14.6	0.352/-	15.4	NA	NA	DFOP
Emperor Lake	5.6	7.4	20	2.38/7.92	2.80	2.38/7.92	2.80	NA	NA	SFO
Bury Pond	7.4	7.9	20	0.753/2.5	12.9	0.753/2.5	12.9	NA	NA	SFO
Calwich Abbey	7.6	7.4	20	3.33/11.1	6.89	3.23/10.7	8.06	NA	NA	SFO
Swiss Lake	7.3	5.3	20	8.9/29.7	7.93	9.48/31.5	10.2	NA	NA	SFO
Geometric mean at 20°C				1.87		1.51				

-for Houghton Meadow and Bury Pond (1) the modelling DT50 is based on the slow phase DT50. A corresponding DT90 value is provided nor useful.

For the metabolites only modelling endpoints have been generated. In most cases the endpoint would be the same for persistence (SFO); in cases where biphasic kinetics was applied separate persistence (P) and modelling (M) values are given

Metabolite: **R182281(C5)** Modelling endpoints	Distribution (Max. in water 44.5% AR - Max. sediment 11.7 % AR Kinetic formation fraction (k_f/k_{dp}): NA								
Water / sediment system	pH water phase	pH sed	t. °C	DT_{50} whole sys.	St. (χ^2)	DT_{50} /DT_{90} water	St. (χ^2)	Formation fraction	Method of calculation
Houghton Meadow	6.7	7.3	20	1000/3320	39.2	NA	NA	NA	SFO (default value)
Bury Pond	5.5	8.0	20	1000/3320	26.8	NA	NA	NA	SFO (default value)
Calwich Abbey	7.6	7.4	20	104/344	5.98	NA	NA	NA	SFO (slow phase metabolite decline fit)
Swiss Lake	7.3	5.3	20	47.4/158	7.66	NA	NA	NA	SFO (metabolite decline fit)
Geometric mean at 20°C				**265**		**NA**			

NA = not applicable

Metabolite: **R613841** Modelling endpoints	Distribution (Max. in water 34.2% AR - Max. sediment 11.6 % AR Kinetic formation fraction (k_f/k_{dp}): From Parent								
Water / sediment system	pH water phase	pH sed	t. °C	DT_{50} whole sys.	St. (χ^2)	DT_{50} /DT_{90} water	St. (χ^2)	Formation fraction	Method of calculation

Emperor Lake	5.6	7.4	20	18.5/61.4	17.2	NA	NA	0.151 (from parent)	SFO
Calwich Abbey	7.6	7.4	20	61.9/206	11.0	NA	NA	N/A	SFO (slow phase metabolite decline fit)
Swiss Lake	7.3	5.3	20	90.8/302	14.2	NA	NA	0.338 (from parent)	SFO
Geometric mean at 20°C				**47.0**		**NA**			
Arithmetic mean								**0.245**	

NA = not applicable

Metabolite: **R613842** Modelling endpoints	Distribution (Max. in water NA - Max. sediment 9.0 % AR Kinetic formation fraction (k_f/k_{dp}): NA								
Water / sediment system	pH water phase	pH sed [a)]	t. °C	DT_{50} whole sys.	St. (χ^2)	DT_{50} /DT_{90} water	St. (χ^2)	Formation fraction	Method of calculation
Calwich Abbey	7.6	7.4	20	34.7/115	21.4	NA	NA	N/A	SFO (metabolite decline fit)
Geometric mean at 20°C				**NA**					

NA = not applicable

Metabolite: **R613801(C-1)** Modelling endpoints	Distribution (Max. in water 7.1% AR - Max. sediment 20.3 % AR Kinetic formation fraction (k_f/k_{dp}): NA								
Water / sediment system	pH water phase	pH sed [a)]	t. °C	DT_{50} whole sys.	St. (χ^2)	DT_{50} /DT_{90} water	St. (χ^2)	Formation fraction	Method of calculation
Houghton Meadow	6.7	7.3	20	18.5/61.3	17.5	NA	NA	0.246	SFO
Bury Pond	5.5	8.0	20	22.8/75.6	11.5	NA	NA	0.200	SFO
Calwich Abbey	7.6	7.4	20	8.78/29.2	11.1	NA	NA	NA	SFO (metabolite decline fit)
Geometric mean at 20°C				**15.5**					
Arithmetic mean								**0.223**	

NA = not applicable

Metabolite: **SYN546671 (C6)** Modelling endpoints	Distribution (Max. in water NA - Max. sediment 10.3 % AR Kinetic formation fraction (k_f/k_{dp}): NA where possible indicate a value for each experiment, clarifying whether fraction was derived for whole system or sediment and or water compartments. The identity of the precursor should also be included (e.g. from parent). Arithmetic mean of kinetic formation fractions to be stated. When calculating arithmetic means, the compartments: whole system, water, sediment should not be mixed.

Water / sediment system	pH water phase	pH sed [a)]	t. °C	DT_{50} whole sys.	St. (χ^2)	DT_{50} /DT_{90} water	St. (χ^2)	Formation fraction	Method of calculation
Houghton Meadow	6.7	7.3	20	P:0.477/84.8 M:25.5/-	15.3	NA	NA	NA	DFOP
Bury Pond	5.5	8.0	20	1000/3320	n.a.	NA	NA	NA	default value
Geometric mean at 20°C[b)]				**160**					

NA = not applicable

Mineralisation and non extractable residues (from parent dosed experiments)					
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	Non-extractable residues in sed. max x % after n d (end of the study)
Houghton Meadow	6.7	7.3	4.8	NA	36.5
Bury Pond	5.5	8.0	9.0	NA	32.7
Emperor Lake	5.6	7.4	0.3	NA	68.9
Bury Pond	7.4	7.9	0.4	NA	67.2
Calwich Abbey	7.6	7.4	<0.1	NA	65.2
Swiss Lake	7.3	5.3	0.3	NA	29.6

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

Direct photolysis in air	Not available, not required
Photochemical oxidative degradation in air	DT_{50} of 4.7 years derived by the Atkinson model
Volatilisation	from plant surfaces (BBA guideline): No loss over 24 hours (20.3°C)
	from soil surfaces (BBA guideline): No loss over 24 hours (19.7°C)
Metabolites	Not required

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:** Chlorothalonil R182281 (compound 2, SDS3701) R417888 (M12, VIS-01, compound 10) R418503 (M13, compound 11) R419492 (M8, compound 12) R471811 (M4, compound 13) SYN507900 (SDS66882) R611965 (M5, compound 4, SDS46851) R611966 (compound 5, SDS47523)

R611967 (compound 6, SDS47524) R613636 (M14, compound 3, SDS19221) **Surface water and Sediment:** Chlorothalonil R182281 (compound 2, SDS3701) R417888 (M12, VIS-01, compound 10) R418503 (M13, compound 11) R419492 (M8, compound 12) R471811 (M4, compound 13) SYN507900 (SDS66882) SYN546671(C6) SYN546934 (MM196) SYN548008 (M3) SYN548581 (M11, VIS-01 isomer) R611965 (M5, compound 4, SDS46851) R611966 (compound 5, SDS47523) R611967 (compound 6, SDS47524) R613636 (M14, compound 3, SDS19221) R613801 (MM230, C-1, PD2) R613841 (SDS67042) R613842 (SDS67042-sulfoxide) R950107 (Postulated R182281 isomer) M2 M7 M10 PD1 (R613911) PD2 (R613801) PD4 PD5 (SYN549430) U38 U40 U44 **Groundwater:** Chlorothalonil R182281 (compound 2, SDS3701) R417888 (M12, VIS-01, compound 10) R418503 (M13, compound 11) R419492 (M8, compound 12) R471811 (M4, compound 13) SYN507900 (SDS66882) SYN548008 (M3) SYN548581 (M11, VIS-01 isomer) R611965 (M5, compound 4, SDS46851)

	R611966 (compound 5, SDS47523) R611967 (compound 6, SDS47524) R611968 R613636 (M14, compound 3, SDS19221) M2 M7 M10 **Air:** Chlorothalonil

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

	Chlorothalonil in soil, water and air

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

Soil (indicate location and type of study)	**Italy**: Field leaching to subsurface drains at 1 site. Chlorothalonil, R417888 and R611965 monitored.
Surface water (indicate location and type of study)	Not required
Ground water (indicate location and type of study)	**Germany**: retrospective and prospective monitoring in 4 regions (18 reliable sites) - Schleswig-Holstein over 7 years (July 2006 to Oct 2013) and over four year periods in Mecklenburg-West Pomerania (July 2005 to June 2009), the Thuringian Basin (July 2006 to June 2010) and the Rottal region (July 2005 to June 2009). Chlorothalonil, R417888, R611965, R419492 and R471811 monitored.
Air (indicate location and type of study)	Not required

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

Parent Method of calculation	DT_{50} (d): 28.4 days Kinetics: SFO Field or Lab: Worst case, non-normalised value from field studies.

Application data	A14111B (Syngenta) Chlorothalonil 500 g/L SC (Oxon Italia S.p.A.) ARY-0474-001 (Arysta) Crop: Cereals Depth of soil layer: 5cm Soil bulk density: 1.5g/cm^3 Plant interception [%]: 80 Number of applications: 2 Interval (d): 14 Application rate(s): 750 g a.s./ha Crop: tomatoes Depth of soil layer: 5cm Soil bulk density: 1.5g/cm^3 Plant interception [%]: 80 Number of applications: 1 Interval (d): - Application rate(s): 1000 g a.s./ha Crop: potatoes (only Oxon) Depth of soil layer: 5cm Soil bulk density: 1.5g/cm^3 Plant interception [%]: 85 Number of applications: 1 Interval (d): - Application rate(s): 750 g a.s./ha

Cereals

PEC$_{(s)}$ (mg/kg)		Single application Actual	Single application Time weighted average	Multiple application Actual	Multiple application Time weighted average
Initial		0.200		0.342	
Short term	24h	0.195	0.198	0.334	0.338
	2d	0.190	0.195	0.326	0.334
	4d	0.181	0.191	0.310	0.326
Long term	7d	0.169	0.184	0.288	0.314
	14d	0.142	0.169	0.243	0.290
	21d	0.120	0.156	0.205	0.268
	28d	0.101	0.145	0.173	0.248
	50d	0.059	0.116	0.101	0.198

PEC$_{(s)}$ (mg/kg)	Single application Actual	Single application Time weighted average	Multiple application Actual	Multiple application Time weighted average
100d	0.017	0.075	0.030	0.128
Plateau concentration	Not applicable			

Tomatoes

PEC$_{(s)}$ (mg/kg)		Single application Actual	Single application Time weighted average
Initial		0.267	
Short term	24h	0.260	0.263
	2d	0.254	0.260
	4d	0.242	0.254
Long term	7d	0.225	0.245
	14d	0.189	0.226
	21d	0.160	0.209
	28d	0.135	0.193
	50d	0.079	0.154
	100d	0.023	100
Plateau concentration		Not applicable	

Potatoes (Oxon)

PEC$_{(s)}$ (mg/kg)		Single application Actual	Single application Time weighted average
Initial		0.150	
Short term	24h	0.146	0.148
	2d	0.143	0.146
	4d	0.136	0.143
Long term	7d	0.126	0.138
	28d	0.107	0.127
	50d	0.090	0.117
	100d	0.076	0.109
Plateau concentration		Not applicable	

Metabolites
Method of calculation

R182281		
Molecular weight	247.5	g/mole
Molar correction factor [a]	0.931	-
Worst-case DT_{50}	609	days
Maximum observed in soil	32.0	% AR
R417888		
Molecular weight	329.5	g/mole
Molar correction factor [a]	1.239	-
Worst-case DT_{50}	1000	days
Maximum observed in soil	15.2	% AR
R418503		
Molecular weight	357	g/mole
Molar correction factor [a]	1.343	-
Worst-case DT_{50}	1000	days
Maximum observed in soil	6.1	% AR
R419492		
Molecular weight	375.2	g/mole
Molar correction factor [a]	1.411	-
Worst-case DT_{50}	1000	days
Maximum observed in soil	12.4	% AR
R471811		
Molecular weight	369.5	g/mole
Molar correction factor [a]	1.390	-
Worst-case DT_{50}	1000	days
Maximum observed in soil	11.9	% AR
SYN507900		
Molecular weight	265.5	g/mole
Molar correction factor [a]	0.998	-
Worst-case DT_{50}	355	days
Maximum observed in soil	5.8	% AR
R611965		
Molecular weight	268.5	g/mole
Molar correction factor [a]	1.01	-
Worst-case DT_{50}	1000	days
Maximum observed in soil	13.2	% AR
R611966		
Molecular weight	249.5	g/mole
Molar correction factor [a]	0.938	-
Worst-case DT_{50}	156	days
Maximum observed in soil	8.1	% AR
R611967		
Molecular weight	249.5	g/mole
Molar correction factor [a]	0.938	-

Worst-case DT_{50}	16.4	days
Maximum observed in soil	13.2	% AR
R613636		
Molecular weight	283.9	g/mole
Molar correction factor [a]	1.068	-
Worst-case DT_{50}	106	days
Maximum observed in soil	10.4	% AR

Field or Lab: worst case from lab studies for all metabolites

Application data	Application rate assumed: maximum observed % * molar correction factor * dose rate parent

Formulation/ compound	$PEC_{S,\ initial}$ [mg a.s./kg]	$PEC_{S,\ plateau}$ [mg/kg]	$PEC_{S,\ peak\ accum}$ [mg/kg]
cereals, 2x 750 g a.s./ha, interval 14 days, interception 80%			
chlorothalonil	**0.342**	-	-
R182281	0.118	0.233	**0.351**
R417888	0.075	0.263	**0.338**
R418503	0.033	0.114	**0.147**
R419492	0.070	0.244	**0.314**
R471811	0.066	0.231	**0.297**
SYN507900	0.020	0.036	**0.056**
R611965	0.053	0.186	**0.239**
R611966	0.029	0.008	**0.037**
R611967	**0.039**	-	-
R613636	**0.042**	-	-
Tomatoes, 1x 1000 g a.s./ha, interception 80%			
chlorothalonil	**0.267**	-	-
R182281	0.079	0.154	**0.234**
R417888	0.050	0.174	**0.225**
R418503	0.022	0.076	**0.098**
R419492	0.047	0.162	**0.209**
R471811	0.044	0.153	**0.197**
SYN507900	0.015	0.024	**0.039**
R611965	0.036	0.123	**0.159**
R611966	0.020	0.005	**0.025**
R611967	**0.033**	-	-
R613636	**0.030**	-	-
Potatoes, 1x 750 g a.s./ha, interception 85%			
chlorothalonil	**0.150**	-	-
R182281	0.045	0.087	**0.131**
R417888	0.028	0.098	**0.126**

R418503	0.012	0.043	**0.055**
R419492	0.026	0.091	**0.117**
R471811	0.025	0.086	**0.111**
SYN507900	0.009	0.014	**0.023**
R611965	0.020	0.069	**0.089**
R611966	0.011	0.003	**0.014**
R611967	**0.019**	-	-
R613636	**0.017**	-	-

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)	For FOCUS gw modelling, values used – Modelling using FOCUS model(s), with appropriate FOCUSgw scenarios, according to FOCUS guidance. Models used: FOCUS PEARL (4.4.4), FOCUS PELMO (5.5.3) Crop: cereals, tomato and potato Crop uptake factor: 0 Water solubility (mg/L): 0.81 at pH 7 and 25°C Vapour pressure: 7.26 × 10^{-5} Pa at 20°C Geometric mean parent $DT_{50\ lab}$ 4.29 d for parent simulations, 2.90 d for metabolite simulations Geometric mean K_{OC}: 1288.4 L/kg (correct value 1403 L/kg**)** Metabolites: see separate input table
Application rate	Gross application rate: 750 (cereals)/1000 (tomatoes)/750 (potatoes) g/ha. Crop growth stage: BBCH 30/51/40 Canopy interception %: 80/90 (cereals)/80 (tomatoes)/85 (potatoes) No. of applications: 2/1/1 Time of application (absolute or relative application dates): Cereals (applicant): absolute application

Scenario	**Application to winter cereals**		**Application to spring cereals**	
	1st app	2nd app	1st app	2nd app
Châteaudun	01-March	01-April	15-May	15-June
Hamburg	01-March	01-April	01-June	01-July
Jokioinen	01-March	01-April	01-June	01-July
Kremsmünster	15-February	15-March	01-June	01-July
Okehampton	15-March	15-April	01-June	01-July
Piacenza	15-February	15-March	N/A	N/A

Porto	15-March	15-April	15-May	15-June
Sevilla	01-March	01-April	N/A	N/A
Thiva	15-March	15-April	N/A	N/A

Cereals (RMS): absolute application

Scenario	Application to winter cereals	
	1st app	2nd app
Châteaudun	01-March	15-March
Hamburg	01-March	15- March
Jokioinen	01-March	15- March
Kremsmünster	15-February	1-March *
Okehampton	15-March	29-March
Piacenza	15-February	1-March *
Porto	15-March	29-March
Sevilla	01-March	15- March
Thiva	15-March	29- March

* Leap years ignored

Tomatoes (applicant): absolute application

Scenario	Application to tomatoes
Châteaudun	01-July
Piacenza	01-July
Porto	01-June
Sevilla	01-July
Thiva	01-June

Potatoes (applicant): relative application: 2 weeks before maximum LAI for each scenario

Scenario	Application to potato
Châteaudun	1st June
Hamburg	6th July
Jokioinen	16th August
Kremsmünster	6th July
Okehampton	1st July
Piacenza	17th May
Porto	16th May
Sevilla	17th March
Thiva	16th April

* Only relevant after implementation of the published EFSA guidance.

Input parameters for chlorothalonil and chlorothalonil soil and lysimeter metabolites used in the revised PEC_{GW} modelling taking into consideration the outcome of the expert meeting (PRAS 163)

Parameter	chlorothalonil	R182281	R417888	R418503	R419492
Molar Mass (g/mol)	265.9	247.5	329.5	357	375.2
Aqueous Solubility at 20 °C (mg/L)	0.81@25°C	13.5	18,000	18,000^	18,000^
Saturated Vapour Pressure at 20 °C (Pa)	7.26E-5	0[a]	0[a]	0[a]	0[a]
Plant Uptake Factor	0 [a]	0[a]	0[a]	0[a]	0[a]
K_{FOC} (L/kg)[b]	1403	386	9.50	2.0	0
K_{FOM} (L/kg)	813.8	223.9	5.51	1.16	0
1/n[c]	0.87	0.88	1.01	0.87	0.9
Soil Half-life (days)[d]	2.90	143.9	332	30.8	377
Formation fraction	-	0.186	0.108	0.043	(1) 0.049 (2) 1.0 (3)0.451
Formed from	-	Chlorothalonil	Chlorothalonil	Chlorothalonil	Chlorothalonil(1) R418503 (2) R417888 (3)

a – worst-case assumption
b – geometric mean
c – arithmetic mean
d – all geometric mean laboratory soil.
^ Assumed equal to R417888 based on structure

cont…: input parameters for chlorothalonil and chlorothalonil soil and lysimeter metabolites used in the revised PEC_{GW} modelling taking into consideration the outcome of the expert meeting (PRAS 163)

Parameter	R471811	SYN507900	SYN548008 (M3)	SYN548581 (M11)
Molar Mass (g/mol)	369.5	265.5	393.2	329.5
Aqueous Solubility at 20 °C (mg/L)	18,000^	75.9^^	18,000^	18,000^
Saturated Vapour Pressure at 20 °C (Pa)	0[a]	0[a]	0[a]	0[a]
Plant Uptake Factor	0[a]	0[a]	0[a]	0[a]
K_{FOC} (L/kg)[b]	0	15.7	0 [a]	9.50^^^
K_{FOM} (L/kg)	0	9.13	0 [a]	5.51^^^
1/n[c]	0.9	1.16	1	1
Soil Half-life (days)[d]	582	180	1000 [a]	332^^^
Formation fraction	(1) 0.020 (2) 0.766	1	(1)1 (2)1	1
Formed from	Chlorothalonil(1) R417888 (2)	R182281	R419492 (1) R471811 (2)	R613636

a – worst-case assumption
b – geometric mean
c – arithmetic mean
d – geometric mean laboratory soil
^ Assumed equal to R417888 based on structure
^^ Assumed equal to R611965 based on comparable chromatographic behaviour
^^^ agreed at expert meeting to use the input parameters of R417888 as a reasonable worst-case

cont…: input parameters for chlorothalonil and chlorothalonil soil and lysimeter metabolites used in the revised PEC_{GW} modelling taking into consideration the outcome of the expert meeting (PRAS 163)

Parameter	R611965	R611966	R611967	R611968	R613636
Molar Mass (g/mol)	268.5	249.5	249.5	265.5	283.9
Aqueous Solubility at 25 °C (mg/L)	75.9	13.5	13.5	13.5	13.5
Saturated Vapour Pressure at 20 °C (Pa)	0[a]	0[a]	0[a]	0[a]	0[a]
Plant Uptake Factor	0[a]	0[a]	0[a]	0[a]	0[a]
K_{FOC} (L/kg)[b]	15.62	562.5*	424.6*	78	234.7
K_{FOM} (L/kg)	9.06	327	247	45.2	136
1/n[c]	0.87	1.01	1.05	1.02	0.87
Soil Half-life (days)[d]	381	75.1	26.5	55.1	33.0
Formation fraction	(1) 0.060 (2) 0.946	0.079	0.154	0.067	0.091
Formed from	Chlorothalonil(1) R611966 (2)	Chlorothalonil	Chlorothalonil	chlorothalonil	chlorothalonil

a – worst-case assumption
b – geometric mean
c – arithmetic mean
d – geometric mean laboratory soil
*for metabolite R611966 the correct K_{FOC} (L/kg) is 585 and 1/n=1.07; for metabolite R611967 the correct K_{FOC} (L/kg) is 415.

For the unidentified lysimeter metabolites M2, M7 and M10 an alternative approach was followed using transfer factors. Transfer factors are calculated as the ratio of the modelled groundwater concentration of known metabolites (=calc) and the concentrations of known metabolites measured in the lysimeter (=meas), and then used to 'correct' the measured concentration of unknown metabolites in the lysimeter leachate:

(1) *Transfer factor = known metabolites$_{calc}$/ known metabolites$_{meas}$*

(2) *Metabolite X_{calc}= Transfer factor * Metabolite X_{meas}*

Metabolite X= Metabolite in question only found in the lysimeter leachate but not in soil studies.
The largest transfer factor was derived for metabolite M5 (R611695) and is used to transfer the observed lysimeter leachate (maximum annual average concentration, year 1) of M2, M7 and M10 to indicative PECgw values. Transfer factors were derived on the basis of PEARL modelling results only as these in general provide more conservative PECgw values than PELMO. Hence no estimated PECgw values were derived for PELMO.

PEC(gw) - FOCUS modelling results (80th percentile annual average concentration at 1m)

Winter cereals

PEARL

PEARL 4.4.4 /Winter cereals	Scenario	Parent (µg/L)	Metabolite (µg/L)		
			R182281	**R417888**	**R418503**
	Châteaudun	<0.001	<0.001	18.5	0.438
	Hamburg	<0.001	0.006	14.3	1.22
	Jokioinen	<0.001	<0.001	23.1	1.92
	Kremsmünster	<0.001	0.003	8.35	0.797
	Okehampton	<0.001	0.008	7.59	0.803
	Piacenza	<0.001	0.003	10.7	0.483
	Porto	<0.001	<0.001	7.90	0.384
	Sevilla	<0.001	<0.001	15.6	0.040
	Thiva	<0.001	<0.001	23.4	0.121

PEARL 4.4.4 /Winter cereals	Scenario	Metabolite (µg/L)			
		R419492	**R471811**	**SYN507900**	**R611965**
	Châteaudun	28.0	15.5	18.3	17.1
	Hamburg	15.4	6.14	17.8	12.5
	Jokioinen	25.4	10.7	26.1	18.0
	Kremsmünster	8.96	3.52	10.4	7.32
	Okehampton	8.26	3.16	9.02	6.36
	Piacenza	16.3	7.85	11.5	10.6
	Porto	9.21	4.06	8.75	6.52
	Sevilla	29.1	30.6	11.2	11.9
	Thiva	45.0	33.5	21.4	22.1

PEARL 4.4.4 /Winter cereals	Scenario	Metabolite (µg/L)			
		R611966	**R611967**	**R611968**	**R613636**
	Châteaudun	<0.001	<0.001	0.190	<0.001
	Hamburg	0.006	0.001	0.475	<0.001
	Jokioinen	<0.001	<0.001	0.323	<0.001
	Kremsmünster	0.004	<0.001	0.359	<0.001
	Okehampton	0.006	0.002	0.421	<0.001
	Piacenza	0.003	<0.001	0.243	<0.001
	Porto	0.002	<0.001	0.172	<0.001
	Sevilla	<0.001	<0.001	0.013	<0.001
	Thiva	<0.001	<0.001	0.092	<0.001

	Scenario	Metabolite (µg/L)				
		SYN548008 (M3)	**SYN548581 (M11)**	**M2**	**M7**	**M10**
PEARL 4.4.4 /Winter cereals	Châteaudun	14.0	15.7	6.6	15.8	6.6
	Hamburg	2.47	12.0	4.8	11.5	4.8
	Jokioinen	4.24	19.4	6.9	16.6	6.9
	Kremsmünster	1.55	6.91	2.8	6.7	2.8
	Okehampton	1.25	6.08	2.5	5.9	2.5
	Piacenza	6.70	8.95	4.1	9.8	4.1
	Porto	2.47	6.36	2.5	6.0	2.5
	Sevilla	79.2	14.0	4.6	11.0	4.6
	Thiva	47.1	21.0	8.5	20.4	8.5

PELMO

PELMO 5.5.3 /Winter cereals	Scenario	Parent (µg/L)	Metabolite (µg/L)		
			R182281	**R417888**	**R418503**
	Châteaudun	<0.001	<0.001	12.7	0.325
	Hamburg	<0.001	0.003	10.2	0.922
	Jokioinen	<0.001	<0.001	12.9	1.51
	Kremsmünster	<0.001	0.002	8.39	0.724
	Okehampton	<0.001	0.007	6.31	0.721
	Piacenza	<0.001	0.002	8.85	0.454
	Porto	<0.001	0.001	5.60	0.242
	Sevilla	<0.001	<0.001	5.01	0.016
	Thiva	<0.001	<0.001	8.92	0.032

PELMO 5.5.3 /Winter cereals	Scenario	Metabolite (µg/L)			
		R419492	**R471811**	**SYN507900**	**R611965**
	Châteaudun	27.0	11.0	11.8	11.2
	Hamburg	19.6	5.07	12.5	9.31
	Jokioinen	27.0	7.12	15.2	10.5
	Kremsmünster	13.5	3.41	9.33	7.04
	Okehampton	10.5	2.75	7.90	5.58
	Piacenza	14.6	4.91	9.84	8.60
	Porto	9.96	2.97	6.72	4.18
	Sevilla	11.2	6.03	4.37	4.76
	Thiva	20.0	9.82	8.70	8.44

PELMO 5.5.3 /Winter cereals	Scenario	Metabolite (µg/L)			
		R611966	**R611967**	**R611968**	**R613636**
	Châteaudun	<0.001	<0.001	0.137	<0.001
	Hamburg	0.004	0.001	0.390	<0.001
	Jokioinen	0.001	<0.001	0.331	<0.001
	Kremsmünster	0.003	0.001	0.329	<0.001
	Okehampton	0.006	0.001	0.371	<0.001
	Piacenza	0.002	0.001	0.213	<0.001
	Porto	0.002	0.001	0.192	<0.001
	Sevilla	<0.001	<0.001	0.013	<0.001
	Thiva	<0.001	<0.001	0.030	<0.001

	Scenario	Metabolite (µg/L)				
		SYN548008 (M3)	**SYN548581 (M11)**	**M2**	**M7**	**M10**
PELMO 5.5.3 /Winter cereals	Châteaudun	14.6	10.6	Not calculated	Not calculated	Not calculated
	Hamburg	3.19	8.23			
	Jokioinen	3.92	10.9			
	Kremsmünster	2.24	6.25			
	Okehampton	1.60	5.20			
	Piacenza	4.88	7.48			
	Porto	2.63	4.68			
	Sevilla	11.2	4.47			
	Thiva	16.6	7.81			

Spring cereals

PEARL

	Scenario	Parent (µg/L)	Metabolite (µg/L)		
			R182281	**R417888**	**R418503**
PEARL 4.4.4 /Spring cereals	Châteaudun	<0.001	<0.001	13.9	0.400
	Hamburg	<0.001	0.008	18.7	2.19
	Jokioinen	<0.001	<0.001	16.1	2.03
	Kremsmünster	<0.001	0.003	8.86	0.914
	Okehampton	<0.001	0.007	7.13	0.833
	Porto	<0.001	<0.001	7.54	0.350

	Scenario	Metabolite (µg/L)			
		R419492	**R471811**	**SYN507900**	**R611965**
PEARL 4.4.4 /Spring cereals	Châteaudun	21.1	11.6	14.4	12.6
	Hamburg	20.1	7.80	22.7	15.9
	Jokioinen	21.1	8.64	18.0	12.4
	Kremsmünster	9.99	4.08	11.8	8.16
	Okehampton	8.28	3.16	9.17	6.51
	Porto	8.82	3.69	8.17	6.16

	Scenario	Metabolite (µg/L)			
		R611966	**R611967**	**R611968**	**R613636**
PEARL 4.4.4 /Spring cereals	Châteaudun	<0.001	<0.001	0.150	<0.001
	Hamburg	0.007	0.002	0.660	<0.001
	Jokioinen	<0.001	<0.001	0.374	<0.001
	Kremsmünster	0.004	<0.001	0.374	<0.001
	Okehampton	0.005	0.001	0.428	<0.001
	Porto	0.002	<0.001	0.235	<0.001

	Scenario	Metabolite (µg/L)				
		SYN548008 (M3)	**SYN548581 (M11)**	**M2**	**M7**	**M10**
PEARL 4.4.4 /Spring cereals	Châteaudun	10.3	12.2	4.9	11.6	4.9
	Hamburg	2.72	15.3	6.1	14.6	6.1
	Jokioinen	2.82	13.5	4.8	11.4	4.8
	Kremsmünster	1.79	7.58	3.2	7.6	3.2
	Okehampton	1.20	5.97	2.5	6.0	2.5
	Porto	2.16	6.13	2.4	5.6	2.4

PELMO

	Scenario	Parent (µg/L)	Metabolite (µg/L)		
			R182281	**R417888**	**R418503**
PELMO 5.5.3 /Spring cereals	Châteaudun	<0.001	<0.001	9.25	0.200
	Hamburg	<0.001	0.002	9.51	0.859
	Jokioinen	<0.001	<0.001	10.6	1.32
	Kremsmünster	<0.001	0.001	7.94	0.711
	Okehampton	<0.001	0.004	5.15	0.579
	Porto	<0.001	0.001	4.03	0.175

PELMO 5.5.3 /Spring cereals	Scenario	Metabolite (µg/L)			
		R419492	**R471811**	**SYN507900**	**R611965**
	Châteaudun	18.5	7.40	9.37	8.41
	Hamburg	16.4	4.15	11.3	8.53
	Jokioinen	21.1	5.46	12.9	8.42
	Kremsmünster	13.4	3.54	9.55	6.92
	Okehampton	8.95	2.24	6.74	4.88
	Porto	7.74	2.34	5.30	3.43

PELMO 5.5.3/Spring cereals	Scenario	Metabolite (µg/L)			
		R611966	**R611967**	**R611968**	**R613636**
	Châteaudun	<0.001	<0.001	0.091	<0.001
	Hamburg	0.003	0.001	0.389	<0.001
	Jokioinen	0.001	<0.001	0.288	<0.001
	Kremsmünster	0.003	0.001	0.303	<0.001
	Okehampton	0.004	0.001	0.340	<0.001
	Porto	0.001	<0.001	0.144	<0.001

PELMO 5.5.3 /Spring cereals	Scenario	Metabolite (µg/L)				
		SYN548008 (M3)	**SYN548581 (M11)**	**M2**	**M7**	**M10**
	Châteaudun	9.26	8.04	Not calculated	Not calculated	Not calculated
	Hamburg	2.70	7.77			
	Jokioinen	2.67	8.95			
	Kremsmünster	2.46	6.73			
	Okehampton	1.43	4.36			
	Porto	1.94	3.56			

Tomatoes

PEARL

PEARL 4.4.4 /Tomatoes	Scenario	Parent (µg/L)	Metabolite (µg/L)		
			R182281	**R417888**	**R418503**
	Châteaudun	<0.001	<0.001	12.4	0.580
	Piacenza	<0.001	0.003	10.6	0.334
	Porto	<0.001	<0.001	5.60	0.244
	Sevilla	<0.001	<0.001	13.6	0.229
	Thiva	<0.001	<0.001	17.3	0.282

PEARL 4.4.4 /Tomatoes	Scenario	Metabolite (µg/L)			
		R419492	**R471811**	**SYN507900**	**R611965**
	Châteaudun	16.4	7.68	13.8	11.8
	Piacenza	13.8	7.51	12.4	10.2
	Porto	5.93	2.54	6.84	4.76
	Sevilla	24.8	17.2	11.4	12.1
	Thiva	24.2	14.3	15.0	14.8

PEARL 4.4.4 /Tomatoes	Scenario	Metabolite (µg/L)			
		R611966	**R611967**	**R611968**	**R613636**
	Châteaudun	0.001	<0.001	0.254	<0.001
	Piacenza	0.004	<0.001	0.266	<0.001
	Porto	0.002	<0.001	0.193	<0.001
	Sevilla	<0.001	<0.001	0.094	<0.001
	Thiva	<0.001	<0.001	0.155	<0.001

PEARL 4.4.4 /Tomatoes	Scenario	Metabolite (µg/L)				
		SYN548008 (M3)	**SYN548581 (M11)**	**M2**	**M7**	**M10**
	Châteaudun	5.00	10.5	4.6	10.9	4.6
	Piacenza	6.15	9.38	3.9	9.4	3.9
	Porto	1.42	4.83	1.9	4.4	1.9
	Sevilla	22.4	12.0	4.7	11.2	4.7
	Thiva	15.1	14.2	5.7	13.7	5.7

PELMO

PELMO 5.5.3 /Tomatoes	Scenario	Parent (µg/L)	Metabolite (µg/L)		
			R182281	**R417888**	**R418503**
	Châteaudun	<0.001	<0.001	10.6	0.483
	Piacenza	<0.001	0.002	6.70	0.349
	Porto	<0.001	0.001	3.64	0.135
	Sevilla	<0.001	<0.001	5.21	0.053
	Thiva	<0.001	<0.001	7.83	0.125

PELMO 5.5.3 /Tomatoes	Scenario	Metabolite (µg/L)			
		R419492	**R471811**	**SYN507900**	**R611965**
	Châteaudun	22.4	7.69	11.3	10.1
	Piacenza	11.2	3.49	8.49	6.60
	Porto	6.14	1.82	4.57	2.97
	Sevilla	10.3	4.95	4.75	4.32
	Thiva	16.8	8.45	7.96	7.48

PELMO 5.5.3 /Tomatoes	Scenario	Metabolite (µg/L)			
		R611966	**R611967**	**R611968**	**R613636**
	Châteaudun	<0.001	<0.001	0.181	<0.001
	Piacenza	0.003	0.001	0.229	<0.001
	Porto	0.002	0.001	0.142	<0.001
	Sevilla	<0.001	<0.001	0.020	<0.001
	Thiva	<0.001	<0.001	0.081	<0.001

PELMO 5.5.3 /Tomatoes	Scenario	Metabolite (µg/L)				
		SYN548008 (M3)	**SYN548581 (M11)**	**M2**	**M7**	**M10**
	Châteaudun	8.34	9.03	Not calculated	Not calculated	Not calculated
	Piacenza	3.20	5.89			
	Porto	1.52	3.12			
	Sevilla	7.65	4.59			
	Thiva	12.8	6.59			

Potatoes (Oxon only)

PEARL

PEARL 4.4.4 / potatoes	Scenario	Parent (µg/L)	Metabolite (µg/L)		
			R182281	**R417888**	**R418503**
	Châteaudun	<0.001	<0.001	7.26	0.34
	Hamburg	<0.001	0.001	6.73	0.87
	Jokioinen	<0.001	<0.001	6.51	1.14
	Kremsmünster	<0.001	<0.001	4.23	0.41
	Okehampton	<0.001	0.001	3.34	0.39
	Piacenza	<0.001	<0.001	4.99	0.16
	Porto	<0.001	<0.001	2.56	0.06
	Sevilla	<0.001	<0.001	5.29	0.03
	Thiva	<0.001	<0.001	9.41	0.13

PEARL 4.4.4 / potatoes	Scenario	Metabolite (µg/L)			
		R419492	**R471811**	**SYN507900**	**R611965**
	Châteaudun	9.05	4.04	7.56	6.02
	Hamburg	7.46	2.85	8.39	5.72
	Jokioinen	8.07	3.05	7.41	4.61
	Kremsmünster	4.43	1.73	4.98	3.77
	Okehampton	3.67	1.37	4.33	3.05
	Piacenza	6.26	3.40	5.55	4.60
	Porto	3.26	1.46	3.07	2.15
	Sevilla	10.2	7.51	4.69	5.05
	Thiva	13.9	8.47	8.07	7.75

PEARL 4.4 / potatoes	Scenario	Metabolite (µg/L)			
		R611966	**R611967**	**R611968**	**R613636**
	Châteaudun	<0.001	<0.001	0.147	<0.001
	Hamburg	0.002	<0.001	0.267	<0.001
	Jokioinen	<0.001	<0.001	0.184	<0.001
	Kremsmünster	0.002	<0.001	0.177	<0.001
	Okehampton	0.002	0.001	0.221	<0.001
	Piacenza	0.002	<0.001	0.138	<0.001
	Porto	<0.001	<0.001	0.065	<0.001
	Sevilla	<0.001	<0.001	0.027	<0.001
	Thiva	<0.001	<0.001	0.071	<0.001

PEARL 4.4 /Potato	Scenario	Metabolite (µg/L)				
		SYN548008 (M3)	**SYN548581 (M11)**	**M2**	**M7**	**M10**
	Châteaudun	2.69	5.90	2.3	5.5	2.3
	Hamburg	0.940	5.45	2.2	5.3	2.2
	Jokioinen	0.683	5.27	1.8	4.2	1.8
	Kremsmünster	0.748	3.34	1.5	3.5	1.5
	Okehampton	0.504	2.88	1.2	2.8	1.2
	Piacenza	2.78	4.22	1.8	4.2	1.8
	Porto	0.885	2.11	0.9	2.0	0.9
	Sevilla	12.0	4.50	2.0	4.7	2.0
	Thiva	9.2	7.55	3.0	7.2	3.0

PELMO

	Scenario	Parent (µg/L)	Metabolite (µg/L)		
			R182281	**R417888**	**R418503**
PELMO 5.5.3 / potatoes	Châteaudun	<0.001	<0.001	4.30	0.194
	Hamburg	<0.001	<0.001	3.44	0.364
	Jokioinen	<0.001	<0.001	4.41	0.856
	Kremsmünster	<0.001	<0.001	3.33	0.313
	Okehampton	<0.001	0.001	2.25	0.259
	Piacenza	<0.001	0.001	2.60	0.109
	Porto	<0.001	<0.001	1.81	0.079
	Sevilla	<0.001	<0.001	4.07	0.037
	Thiva	<0.001	<0.001	2.91	0.045

	Scenario	Metabolite (µg/L)			
		R419492	**R471811**	**SYN507900**	**R611965**
PELMO 5.5.3 / potatoes	Châteaudun	6.24	2.93	4.55	3.39
	Hamburg	2.49	1.49	4.19	2.60
	Jokioinen	8.91	2.10	5.23	2.83
	Kremsmünster	1.84	1.48	4.02	2.60
	Okehampton	0.89	0.896	2.87	1.81
	Piacenza	1.79	1.30	2.82	2.03
	Porto	0.54	0.913	2.32	1.36
	Sevilla	10.9	4.35	3.57	3.07
	Thiva	13.6	1.08	2.80	2.30

	Scenario	Metabolite (µg/L)			
		R611966	**R611967**	**R611968**	**R613636**
PELMO 5.5.3 / potatoes	Châteaudun	<0.001	<0.001	0.095	<0.001
	Hamburg	0.001	<0.001	0.160	<0.001
	Jokioinen	<0.001	<0.001	0.138	<0.001
	Kremsmünster	0.001	<0.001	0.133	<0.001
	Okehampton	0.001	0.001	0.146	<0.001
	Piacenza	0.001	<0.001	0.103	<0.001
	Porto	0.001	<0.001	0.078	<0.001
	Sevilla	<0.001	<0.001	0.022	<0.001
	Thiva	<0.001	<0.001	0.026	<0.001

PELMO 5.5.4/Potato	Scenario	Metabolite (µg/L)				
		SYN548008 (M3)	**SYN548581 (M11)**	**M2**	**M7**	**M10**
	Châteaudun	2.16	3.62	Not calculated	Not calculated	Not calculated
	Hamburg	0.34	2.93			
	Jokioinen	0.91	3.65			
	Kremsmünster	0.31	2.78			
	Okehampton	0.13	1.93			
	Piacenza	0.49	2.03			
	Porto	0.12	1.55			
	Sevilla	5.64	3.40			
	Thiva	8.82	2.45			

PEC surface water and PEC sediment (Regulation (EU) N° 284/2013, Annex Part A, points 9.2.5 / 9.3.1)

Parent Parameters used in FOCUSsw step 1 and 2	Version control no. of FOCUS calculator: 3.2 Molecular weight (g/mol): 265.9 K_{OC}/K_{OM} (mL/g): 1288.4/747.3 (correct K_{OC} value 1403 L/kg) DT_{50} soil (d): 4.29 DT_{50} water/sediment system (d): 1.87 DT_{50} water (d): 1.87 DT_{50} sediment (d): 1000 Crop interception (%): Cereals: Average canopy Tomatoes and Potatoes: Full canopy
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) SPIN (v 2.2) ECPA-SWAN (v 4.0.1) Water solubility (mg/L): 0.81 at 25°C Vapour pressure: 0 Pa at 20°C K_{OC}/K_{OM} (mL/g): 1288.4/747.3 (correct K_{OC} value 1403 L/kg) 1/n: 0.90 (correct 1/n value 0.87) DT_{50} water (d): 1.87/1000* DT_{50} sediment (d): 1000/1.87* Q10=2.58, Walker equation coefficient 0.7

	Crop uptake factor: 0 ** The FOCUS (2012) advice for compounds with K_{OC} between 100 and 2000 mL/g was followed, regarding running simulations with both combinations for ascribing the whole system DT_{50} to either water or sediment and default 1000 days for the other compartment and selecting the results that give the highest concentrations for the risk assessment.*
Application rate	Crop and growth stage: Cereals – BBCH 30-69 Number of applications: 2 Interval (d): 14 Application rate(s): 750 g a.s./ha Crop and growth stage: Tomatoes - BBCH 51 Number of applications: 1 Application rate(s): 1000 g a.s./ha Crop and growth stage: Potatoes - BBCH 40-85 Number of applications: 1 Interval (d): - Application rate(s): 750 g a.s./ha Application window: starting from 2 weeks before intermediate crop development/ maturation date up to 28 day before the harvest.

CEREALS

FOCUS STEPS 1 and 2 **Use pattern**	**Growth stage [BBCH]**	**Step**	**Region / Timing**	**Max PEC_{SW} [µg/L]**	**Max PEC_{SED} [µg/kg]**
Winter cereals 1 x 750 g a.s./ha	30	Step 1	-	98.88	1190
		Step 2	North Europe Mar – May	8.99	116.70
			South Europe Mar – May	16.70	216.06
Winter cereals 2 x 750 g a.s./ha	30	Step 1	-	197.76	2380
		Step 2	North Europe Mar – May	9.78	126.97
			South Europe Mar – May	18.30	236.68
Spring cereals 1 x 750 g a.s./ha	30	Step 1	-	98.88	1190
		Step 2	North Europe Jun – Sep	8.99	116.70
			South Europe Mar – May	16.70	216.06
Spring cereals	30	Step 1	-	197.76	2380

FOCUS STEPS 1 and 2 Use pattern	Growth stage [BBCH]	Step	Region / Timing	Max PEC_{SW} [µg/L]	Max PEC_{SED} [µg/kg]
2 x 750 g a.s./ha		Step 2	North Europe Jun – Sep	9.78	126.97
			South Europe Mar – May	18.30	236.68

FOCUS STEP 3 – Winter cereals – Maximum PEC

Application rate and timing [g a.s./ha]	Scenario	Water body	PEC_{SW} [µg/L]	PEC_{SED} [µg/kg]
Winter Cereals 1 x 750 BBCH 30	D1	Ditch	4.761	3.580
	D1	Stream	3.702	0.155
	D2	Ditch	4.781	5.694
	D2	Stream	3.955	0.359
	D3	Ditch	4.740	2.341
	D4	Pond	0.164	0.415
	D4	Stream	3.507	0.103
	D5	Pond	0.164	0.350
	D5	Stream	3.787	0.109
	D6	Ditch	4.788	4.527
	R1	Pond	0.194	0.484
	R1	Stream	3.137	1.558
	R3	Stream	4.390	1.505
	R4	Stream	3.126	0.419
Winter Cereals 2 x 750 BBCH 30	D1	Ditch	4.195	7.053
	D1	Stream	3.537	0.659
	D2	Ditch	4.178	4.998
	D2	Stream	3.421	0.311
	D3	Ditch	4.147	2.772
	D4	Pond	0.203	0.561
	D4	Stream	3.133	0.129
	D5	Pond	0.232	0.535
	D5	Stream	3.618	0.288
	D6	Ditch	4.324	5.441
	R1	Pond	0.235	0.532
	R1	Stream	2.819	1.538
	R3	Stream	3.819	6.144
	R4	Stream	2.713	2.953

FOCUS STEP 4 – Winter cereals – Surface Water – Maximum PEC

Application rate and timing [g a.s./ha]	Scenario	Water body	PEC_{SW} [µg/L]	PEC_{SW} [µg/L]	PEC_{SW} [µg/L]
Run-off mitigation (FOCUS, 2007 L&M buffer)			-	**10-12m**	**18-20m**
Spray-drift buffer			**10m**	**10m**	**20m**
Drift reducing nozzles			-	-	-
Winter Cereals 1 x 750 BBCH 30	D1	Ditch	0.684	0.684	0.356
	D1	Stream	0.717	0.717	0.373
	D2	Ditch	0.687	0.687	0.357
	D2	Stream	0.766	0.766	0.398
	D3	Ditch	0.681	0.681	0.354
	D4	Pond	0.102	0.102	0.068
	D4	Stream	0.679	0.679	0.353
	D5	Pond	0.102	0.102	0.068
	D5	Stream	0.734	0.734	0.381
	D6	Ditch	0.688	0.688	0.358
	R1	Pond	0.144	0.107	0.068
	R1	Stream	2.819	1.275	0.667
	R3	Stream	0.851	0.851	0.442
	R4	Stream	0.606	0.606	0.315
Winter Cereals 2 x 750 BBCH 30	D1	Ditch	0.565	0.565	0.287
	D1	Stream	0.649	0.649	0.330
	D2	Ditch	0.563	0.563	0.286
	D2	Stream	0.627	0.627	0.319
	D3	Ditch	0.559	0.559	0.284
	D4	Pond	0.124	0.112	0.081
	D4	Stream	0.575	0.575	0.292
	D5	Pond	0.141	0.127	0.093
	D5	Stream	0.664	0.664	0.338
	D6	Ditch	0.582	0.569	0.295
	R1	Pond	0.157	0.123	0.086
	R1	Stream	2.819	1.275	0.667
	R3	Stream	3.355	1.531	0.804
	R4	Stream	1.631	0.736	0.384

FOCUS STEP 4 – Winter cereals – Sediment – Maximum PEC

Application rate and timing [g a.s./ha]	Scenario	Water body	PEC_{SED} [µg/kg]	PEC_{SED} [µg/kg]	PEC_{SED} [µg/kg]
Run-off mitigation (FOCUS, 2007 L&M buffer)			-	**10-12m**	**18-20m**
Spray-drift buffer			**10m**	**10m**	**20m**
Drift reducing nozzles			-	-	-
	D1	Ditch	0.542	0.542	0.287
	D1	Stream	0.030	0.030	0.016
	D2	Ditch	0.878	0.878	0.467

Application rate and timing [g a.s./ha]	Scenario	Water body	PEC_{SED} [µg/kg]	PEC_{SED} [µg/kg]	PEC_{SED} [µg/kg]
Run-off mitigation (FOCUS, 2007 L&M buffer)			-	10-12m	18-20m
Spray-drift buffer			10m	10m	20m
Drift reducing nozzles			-	-	-
Winter Cereals 1 x 750 BBCH 30	D2	Stream	0.070	0.070	0.036
	D3	Ditch	0.349	0.349	0.184
	D4	Pond	0.262	0.262	0.178
	D4	Stream	0.020	0.020	0.010
	D5	Pond	0.221	0.221	0.150
	D5	Stream	0.021	0.021	0.011
	D6	Ditch	0.682	0.682	0.360
	R1	Pond	0.355	0.277	0.179
	R1	Stream	1.434	0.554	0.281
	R3	Stream	1.365	0.387	0.181
	R4	Stream	0.206	0.083	0.043
Winter Cereals 2 x 750 BBCH 30	D1	Ditch	1.030	1.030	0.538
	D1	Stream	0.123	0.123	0.063
	D2	Ditch	0.724	0.724	0.377
	D2	Stream	0.057	0.057	0.029
	D3	Ditch	0.395	0.395	0.204
	D4	Pond	0.348	0.315	0.232
	D4	Stream	0.024	0.024	0.012
	D5	Pond	0.332	0.300	0.221
	D5	Stream	0.054	0.054	0.027
	D6	Ditch	0.793	0.793	0.414
	R1	Pond	0.370	0.282	0.197
	R1	Stream	1.428	0.548	0.277
	R3	Stream	5.792	1.588	0.735
	R4	Stream	2.855	0.989	0.494

FOCUS STEP 3 – Spring Cereals – Maximum PEC

Application rate and timing [g a.s./ha]	Scenario	Water body	PEC_{SW} [µg/L]	PEC_{SED} [µg/kg]
Spring Cereals 1 x 750 BBCH 30	D1	Ditch	4.803	5.314
	D1	Stream	4.200	1.984
	D3	Ditch	4.758	2.793
	D4	Pond	0.164	0.235
	D4	Stream	4.092	0.732
	D5	Pond	0.164	0.258
	D5	Stream	4.423	1.063
	R4	Stream	3.139	0.466
Spring Cereals	D1	Ditch	5.930	7.127
	D1	Stream	3.634	2.232
	D3	Ditch	4.164	3.324

Application rate and timing [g a.s./ha]	Scenario	Water body	PEC_{SW} [µg/L]	PEC_{SED} [µg/kg]
2 x 750 BBCH 30	D4	Pond	0.229	0.342
	D4	Stream	3.550	0.861
	D5	Pond	0.231	0.372
	D5	Stream	3.830	1.198
	R4	Stream	5.070	3.732

FOCUS STEP 4 – Spring Cereals – Surface Water – Maximum PEC

Application rate and timing [g a.s./ha]	Scenario	Water body	PEC_{SW} [µg/L]	PEC_{SW} [µg/L]	PEC_{SW} [µg/L]
Run-off mitigation (FOCUS, 2007 L&M buffer)			-	**10-12m**	**18-20m**
Spray-drift buffer			**10m**	**10m**	**20m**
Drift reducing nozzles			-	-	-
Spring Cereals 1 x 750 BBCH 30	D1	Ditch	0.690	0.690	0.359
	D1	Stream	0.814	0.814	0.423
	D3	Ditch	0.684	0.684	0.355
	D4	Pond	0.102	0.102	0.068
	D4	Stream	0.793	0.793	0.412
	D5	Pond	0.102	0.102	0.068
	D5	Stream	0.857	0.857	0.445
	R4	Stream	0.608	0.608	0.316
Spring Cereals 2 x 750 BBCH 30	D1	Ditch	0.786	0.786	0.397
	D1	Stream	0.667	0.667	0.339
	D3	Ditch	0.561	0.561	0.285
	D4	Pond	0.139	0.139	0.091
	D4	Stream	0.651	0.651	0.331
	D5	Pond	0.141	0.141	0.092
	D5	Stream	0.702	0.702	0.357
	R4	Stream	5.070	2.277	1.188

FOCUS STEP 4 – Spring Cereals – Sediment – Maximum PEC

Application rate and timing [g a.s./ha]	Scenario	Water body	PEC_{SED} [µg/kg]	PEC_{SED} [µg/kg]	PEC_{SED} [µg/kg]
Run-off mitigation (FOCUS, 2007 L&M buffer)			-	**10-12m**	**18-20m**
Spray-drift buffer			**10m**	**10m**	**20m**
Drift reducing nozzles			-	-	-
Spring Cereals 1 x 750 BBCH 30	D1	Ditch	0.804	0.804	0.425
	D1	Stream	0.395	0.395	0.207
	D3	Ditch	0.420	0.420	0.221
	D4	Pond	0.148	0.148	0.100
	D4	Stream	0.144	0.144	0.075
	D5	Pond	0.163	0.163	0.110
	D5	Stream	0.209	0.209	0.109
	R4	Stream	0.091	0.091	0.048

Application rate and timing [g a.s./ha]	Scenario	Water body	PEC_{SED} [µg/kg]	PEC_{SED} [µg/kg]	PEC_{SED} [µg/kg]
Run-off mitigation (FOCUS, 2007 L&M buffer)			-	**10-12m**	**18-20m**
Spray-drift buffer			**10m**	**10m**	**20m**
Drift reducing nozzles			-	-	-
Spring Cereals 2 x 750 BBCH 30	D1	Ditch	0.999	0.999	0.519
	D1	Stream	0.428	0.428	0.221
	D3	Ditch	0.477	0.477	0.247
	D4	Pond	0.211	0.211	0.140
	D4	Stream	0.163	0.163	0.084
	D5	Pond	0.230	0.230	0.153
	D5	Stream	0.227	0.227	0.117
	R4	Stream	3.588	1.494	0.772

TOMATOES

FOCUS STEPS 1 and 2 Use pattern	Growth stage [BBCH]	Step	Region / Timing	Max PEC_{SW} [µg/L]	Max PEC_{SED} [µg/kg]
Tomatoes 1 x 1000 g a.s./ha	51	Step 1	-	131.84	1580
		Step 2	North Europe Jun – Sep	9.20	72.81
			South Europe Jun – Sep	9.20	97.65

FOCUS STEP 3 - Tomatoes – Maximum PEC

Application rate and timing [g a.s./ha]	Scenario	Water body	PEC_{SW} [µg/L]	PEC_{SED} [µg/kg]
Tomatoes 1 x 1000 BBCH 51	D6	Ditch	6.286	1.989
	R2	Stream	5.611	0.437
	R3	Stream	5.901	3.389
	R4	Stream	5.419	4.522

FOCUS STEP 4 – Tomatoes – Surface Water – Maximum PEC

Application rate and timing [g a.s./ha]	Scenario	Water body	PEC_{SW} [µg/L]	PEC_{SW} [µg/L]	PEC_{SW} [µg/L]
Run-off mitigation (FOCUS, 2007 L&M buffer)			-	**10-12m**	**18-20m**
Spray-drift buffer			**10m**	**10m**	**20m**
Drift reducing nozzles			-	-	-
Tomatoes 1 x 1000 BBCH 51	D6	Ditch	0.904	0.904	0.470
	R2	Stream	1.087	1.087	0.565
	R3	Stream	1.169	1.143	0.594
	R4	Stream	5.419	2.465	1.292

FOCUS STEP 4 – Tomatoes – Sediment – Maximum PEC

Application rate and timing [g a.s./ha]	Scenario	Water body	PEC_{SED} [µg/kg]	PEC_{SED} [µg/kg]	PEC_{SED} [µg/kg]
Run-off mitigation (FOCUS, 2007 L&M buffer)			-	**10-12m**	**18-20m**
Spray-drift buffer			**10m**	**10m**	**20m**
Drift reducing nozzles			-	-	-
Tomatoes 1 x 1000 BBCH 51	D6	Ditch	0.294	0.294	0.154
	R2	Stream	0.085	0.085	0.044
	R3	Stream	3.061	0.752	0.332
	R4	Stream	4.312	1.574	0.791

POTATOES

FOCUS STEPS 1 and 2 Use pattern	Growth stage [BBCH]	Step	Region (Timing)	Max. PEC_{SW}[a] [µg/L]	Max. PEC_{SED}[a] [µg/kg]
Potatoes 1 x 750 g a.s./ha	40-85	STEP 1	-	98.88	1190
		STEP 2	North Europe (Mar – May June-Sept.)	6.898 6.898	54.60 54.60
			South Europe (Mar – May)	7.058	91.86

FOCUS STEP 3 – Potatoes – Maximum PEC

Application rate and timing [g a.s./ha]	Scenario	Water body	PEC_{SW} [µg/L]	PEC_{SED} [µg/kg]
Potato 1 x 750 BBCH 40-85	D3	Ditch	3.928	2.066
	D4	Pond	0.159	0.263
	D4	Stream	3.242	0.147
	D6- 1st	Ditch	3.884	1.133
	D6- 2nd	Ditch	3.948	2.498
	R1	Pond	0.469	0.810
	R1	Stream	2.846	8.510
	R2	Stream	3.595	0.564
	R3	Stream	3.827	2.073

FOCUS STEP 4 – Potatoes – Surface Water – Maximum PEC

Application rate and timing [g a.s./ha]	Scenario	Water body	PEC_{SW} [µg/L]	PEC_{SW} [µg/L]
Run-off mitigation (FOCUS, 2007 L&M buffer)			**10-12m**	**18-20m**
Spray-drift buffer			**10m**	**20m**
Drift reducing nozzles			-	-
Potato 1 x 750 BBCH 40-85	D3	Ditch	0.683	0.355
	D4	Pond	0.102	0.068
	D4	Stream	0.724	0.376
	D6- 1st	Ditch	0.675	0.351
	D6- 2nd	Ditch	0.686	0.357
	R1	Pond	0.221	0.125
	R1	Stream	1.296	0.679
	R2	Stream	0.803	0.417
	R3	Stream	1.348	0.705

FOCUS STEP 4 – Potatoes – Sediment – Maximum PEC

Application rate and timing [g a.s./ha]	Scenario	Water body	PEC_{SED} [µg/kg]	PEC_{SED} [µg/kg]
Run-off mitigation (FOCUS, 2007 L&M buffer)			**10-12m**	**18-20m**
Spray-drift buffer			**10m**	**20m**
Drift reducing nozzles			-	-
Potato 1 x 750 BBCH 40-85	D3	Ditch	0.372	0.196
	D4	Pond	0.201	0.136
	D4	Stream	0.033	0.017
	D6- 1st	Ditch	0.201	0.102
	D6- 2nd	Ditch	0.456	0.241
	R1	Pond	0.356	0.205
	R1	Stream	1.779	0.743
	R2	Stream	0.137	0.062
	R3	Stream	0.703	0.356

Metabolites Parameters used in FOCUSsw step 1 and 2	See separate input box
Parameters used in FOCUSsw step 3 (if performed)	Not applicable
Application rate	Crop and growth stage: Cereals – BBCH 30-69 Number of applications: 2 Interval (d): 14 Application rate(s): 750 g a.s./ha Crop and growth stage: Tomatoes - BBCH 51 Number of applications: 1 Application rate(s): 1000 g a.s./ha Crop and growth stage: Potatoes - BBCH 40-85 Number of applications: 1 Interval (d): - Application rate(s): 750 g a.s./ha Application window: starting from 2 weeks before intermediate crop development/ maturation date up to 28 day before the harvest.
Main routes of entry	Not applicable

Input parameters used in revised modelling of PEC_{SW} and PEC_{SED} for chlorothalonil metabolites

Parameters	Value	Units
R182281		
Molecular weight	247.5	g/mol
Water solubility	13.5	mg/L, 20^{o}C
Vapour pressure	0	Pa
DT_{50} soil	148	d NB correct value is 143.9 days
K_{FOC}	395	mL/g NB correct value is 386 mL/kg
DT_{50} Total system	265	d
DT_{50} Water	265	d
DT_{50} Sediment	265	d
Maximum observed in soil	32.0	% AR
Maximum observed in water/sediment systems	46.5	% AR

Parameters	Value	Units
R417888		
Molecular weight	329.5	g/mol
Water solubility	18,000	mg/L, 20°C
Vapour pressure	0	Pa
DT_{50} soil	332	d
K_{FOC}	8.34	mL/g NB correct value is 9.50 mL/kg
DT_{50} Total system	1000	d
DT_{50} Water	1000	d
DT_{50} Sediment	1000	d
Maximum observed in soil	15.2	% AR
Maximum observed in water/sediment systems	0.0001	% AR
R418503		
Molecular weight	357.0	g/mol
Water solubility	18,000	mg/L, 20°C
Vapour pressure	0	Pa
DT_{50} soil	30.8	d
K_{FOC}	2.0	mL/g
DT_{50} Total system	1000	d
DT_{50} Water	1000	d
DT_{50} Sediment	1000	d
Maximum observed in soil	6.1	% AR
Maximum observed in water/sediment systems	0.0001	% AR
R419492		
Molecular weight	375.2	g/mol
Water solubility	18,000	mg/L, 20°C
Vapour pressure	0	Pa
DT_{50} soil	377	d
K_{FOC}	0	mL/g
DT_{50} Total system	1000	d
DT_{50} Water	1000	d
DT_{50} Sediment	1000	d
Maximum observed in soil	12.4	% AR
Maximum observed in water/sediment systems	0.0001	% AR
R471811		
Molecular weight	369.5	g/mol

Parameters	Value	Units
Water solubility	18,000	mg/L, 20°C
Vapour pressure	0	Pa
DT_{50} soil	582	d
K_{FOC}	0	mL/g
DT_{50} Total system	1000	d
DT_{50} Water	1000	d
DT_{50} Sediment	1000	d
Maximum observed in soil	11.9	% AR
Maximum observed in water/sediment systems	0.0001	% AR
SYN507900		
Molecular weight	265.5	g/mol
Water solubility	75.9	mg/L, 20°C
Vapour pressure	0	Pa
DT_{50} soil	180	d
K_{FOC}	15.7	mL/g
DT_{50} Total system	1000	d
DT_{50} Water	1000	d
DT_{50} Sediment	1000	d
Maximum observed in soil	5.8	% AR
Maximum observed in water/sediment systems	0.0001	% AR
SYN546671		
Molecular weight	263.5	g/mol
Water solubility	0.81	mg/L, 20°C (NB should be 25°C)
Vapour pressure	0	Pa
DT_{50} soil	1000	d
K_{FOC}	0	mL/g
DT_{50} Total system	160	d
DT_{50} Water	160	d
DT_{50} Sediment	160	d
Maximum observed in soil	0.0001	% AR
Maximum observed in water/sediment systems	18.3	% AR NB maximum level in sediment was 10.3%, not observed in surface water
SYN546934 *(dichloro-1,3-dicyanobenzene)*		
Molecular weight	197.0	g/mol
Water solubility	0.81	mg/L, 20°C (NB should be 25°C)

Parameters	Value	Units
Vapour pressure	0	Pa
DT_{50} soil	1000	d
K_{FOC}	0	mL/g
DT_{50} Total system	1000	d
DT_{50} Water	1000	d
DT_{50} Sediment	1000	d
Maximum observed in soil	0.0001	% AR
Maximum observed in water/sediment systems	9.4	% AR
R611965		
Molecular weight	268.5	g/mol
Water solubility	75.9	mg/L, 20°C
Vapour pressure	0	Pa
DT_{50} soil	381	d
K_{FOC}	15.62	mL/g
DT_{50} Total system	1000	d
DT_{50} Water	1000	d
DT_{50} Sediment	1000	d
Maximum observed in soil	13.2	% AR
Maximum observed in water/sediment systems	0.0001	% AR
R611966		
Molecular weight	249.5	g/mol
Water solubility	13.5	mg/L, 20°C
Vapour pressure	0	Pa
DT_{50} soil	75.2	d
K_{FOC}	563	mL/g NB correct value is 585 mL/kg
DT_{50} Total system	1000	d
DT_{50} Water	1000	d
DT_{50} Sediment	1000	d
Maximum observed in soil	8.1	% AR
Maximum observed in water/sediment systems	5.4	% AR
R611967		
Molecular weight	249.5	g/mol
Water solubility	13.5	mg/L, 20°C
Vapour pressure	0	Pa

Parameters	Value	Units
DT_{50} soil	26.5	d
K_{FOC}	425	mL/g NB correct value is 415 mL/kg
DT_{50} Total system	1000	d
DT_{50} Water	1000	d
DT_{50} Sediment	1000	d
Maximum observed in soil	13.2	% AR
Maximum observed in water/sediment systems	0.0001	% AR
R611968		
Molecular weight	265.5	g/mol
Water solubility	75.9	mg/L, 20°C
Vapour pressure	0	Pa
DT_{50} soil	55.1	d
K_{FOC}	62.9	mL/g NB RMS endpoint after discarding one soil: 78 L/kg
DT_{50} Total system	1000	d
DT_{50} Water	1000	d
DT_{50} Sediment	1000	d
Maximum observed in soil	6.5	% AR
Maximum observed in water/sediment systems	0.0001	% AR
R613636		
Molecular weight	283.9	g/mol
Water solubility	13.5	mg/L, 20°C
Vapour pressure	0	Pa
DT_{50} soil	33.0	d
K_{FOC}	235	mL/g
DT_{50} Total system	1000	d
DT_{50} Water	1000	d
DT_{50} Sediment	1000	d
Maximum observed in soil	10.4	% AR
Maximum observed in water/sediment systems	47.7	% AR
R613801/PD2		
Molecular weight	231.5	g/mol
Water solubility	0.81	mg/L, 20°C (NB should be 25°C)
Vapour pressure	0	Pa

Parameters	Value	Units
DT_{50} soil	1000	d
K_{FOC}	0	mL/g
DT_{50} Total system	15.5	d
DT_{50} Water	15.5	d
DT_{50} Sediment	1000	d
Maximum observed in soil	0.0001	% AR
Maximum observed in water/sediment systems	20.5	% AR
R613841		
Molecular weight	279.5	g/mol
Water solubility	0.9	mg/L, 20°C
Vapour pressure	0	Pa
DT_{50} soil	1000	d
K_{FOC}	0	mL/g
DT_{50} Total system	47.0	d
DT_{50} Water	47.0	d
DT_{50} Sediment	1000	d
Maximum observed in soil	0.0001	% AR
Maximum observed in water/sediment systems	36.3	% AR
R613842		
Molecular weight	295.5	g/mol
Water solubility	0.9	mg/L, 20°C
Vapour pressure	0	Pa
DT_{50} soil	1000	d
K_{FOC}	0	mL/g
DT_{50} Total system	34.7	d
DT_{50} Water	34.7	d
DT_{50} Sediment	1000	d
Maximum observed in soil	0.0001	% AR
Maximum observed in water/sediment systems	11.7	% AR
PD1 (R613911)		
Molecular weight	197	g/mol
Water solubility	13.5	mg/L, 20°C
Vapour pressure	0	Pa
DT_{50} soil	1000	d
K_{FOC}	0	mL/g

Parameters	Value	Units
DT_{50} Total system	1000	d
DT_{50} Water	1000	d
DT_{50} Sediment	1000	d
Maximum observed in soil	0.0001	% AR
Maximum observed in water/sediment systems	12.2	% AR
PD4		
Molecular weight	229.0	g/mol
Water solubility	75.9	mg/L, 20°C
Vapour pressure	0	Pa
DT_{50} soil	1000	d
K_{FOC}	0	mL/g
DT_{50} Total system	1000	d
DT_{50} Water	1000	d
DT_{50} Sediment	1000	d
Maximum observed in soil	0.0001	% AR
Maximum observed in water/sediment systems	19.9	% AR
PD5 (SYN549430)		
Molecular weight	263.5	g/mol
Water solubility	13.5	mg/L, 20°C
Vapour pressure	0	Pa
DT_{50} soil	1000	d
K_{FOC}	0	mL/g
DT_{50} Total system	1000	d
DT_{50} Water	1000	d
DT_{50} Sediment	1000	d
Maximum observed in soil	0.0001	% AR
Maximum observed in water/sediment systems	32.7	% AR
U38 (Unknown 38 Minutes; Isomer of hydroxyl analogue of R613842)		
Molecular weight	274.9	g/mol
Water solubility	0.9	mg/L, 20°C
Vapour pressure	0	Pa
DT_{50} soil	1000	d
K_{FOC}	0	mL/g
DT_{50} Total system	1000	d
DT_{50} Water	1000	d

Parameters	Value	Units
DT_{50} Sediment	1000	d
Maximum observed in soil	0.0001	% AR
Maximum observed in water/sediment systems	6.7	% AR
U40 (Unknown 40 Minutes; Isomer of hydroxyl analogue of R613842)		
Molecular weight	274.9	g/mol
Water solubility	0.9	mg/L, 20°C
Vapour pressure	0	Pa
DT_{50} soil	1000	d
K_{FOC}	0	mL/g
DT_{50} Total system	1000	d
DT_{50} Water	1000	d
DT_{50} Sediment	1000	d
Maximum observed in soil	0.0001	% AR
Maximum observed in water/sediment systems	24.9	% AR
U44 (Unknown 44 Minutes; deschloro-hydroxy-R613801)		
Molecular weight	210.9	g/mol
Water solubility	13.5	mg/L, 20°C
Vapour pressure	0	Pa
DT_{50} soil	1000	d
K_{FOC}	0	mL/g
DT_{50} Total system	1000	d
DT_{50} Water	1000	d
DT_{50} Sediment	1000	d
Maximum observed in soil	0.0001	% AR
Maximum observed in water/sediment systems	7.0	% AR

Summary of overall maximum PEC_{SW} and PEC_{SED} of chlorothalonil metabolites R182281, R417888, R418503, R419492, R471811, SYN507900, SYN546671, SYN546934, R611965, R611966, R611967, R611968, R613636, R613801 (PD2), R613841, R613842, PD1 (R613911), PD4, PD5 (SYN549430), U38, U40 and U44 following single and multiple applications to cereals, tomatoes and potatoes (Steps 1 & 2)

Substance	Crop	Step	Number of applications	Region (Timing)	Max. PEC_{SW} [µg/L]	Max. PEC_{SED} [µg/kg]
R182281	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	122.64	479.10
			2	-	245.28	958.19
		2	1	North Europe (Mar – May)	15.79	61.21
			2		25.19	97.51
			1	South Europe (Mar – May)	29.39	114.79
			2		46.58	181.80
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	122.64	479.10
			2	-	245.28	958.19
		2	1	North Europe (Jun-Sep)	15.79	61.21
			2		25.19	97.51
			1	South Europe (Mar-May)	29.39	114.79
			2		46.58	181.80
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	163.52	638.80
		2	1	North Europe (Jun-Sep)	9.72	36.96
			1	South Europe (Jun-Sep)	13.12	50.35
	Potatoes (1x750 g a.s./ha, BBCH 40-85	1	1	-	123.400	475.638
		2	1	North Europe Mar – May June-Sept.	7.331 7.331	27.889 27.889
			1	South Europe Mar – May June-Sept.	12.474 9.903	48.154 38.022
R417888	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	46.57	3.88
			2	-	93.14	7.77
		2	1	North Europe (Mar – May)	7.39	0.62
			2		14.57	1.21
			1	South Europe (Mar – May)	14.78	1.23
			2		29.13	2.43
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	46.57	3.88
			2	-	93.14	7.77
		2	1	North Europe (Jun-Sep)	7.39	0.62
			2		14.57	1.21
			1	South Europe (Mar-May)	14.78	1.23
			2		29.13	2.43
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	62.10	5.18
		2	1	North Europe (Jun-Sep)	3.69	0.31

Substance	Crop	Step	Number of applications	Region (Timing)	Max. PEC_{SW} [µg/L]	Max. PEC_{SED} [µg/kg]
			1	South Europe (Jun-Sep)	5.54	0.46
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	46.572	3.884
		2	1	South Europe Mar – May June-Sept.	2.771 2.771	0.231 0.231
			1	North Europe Mar – May June-Sept.	5.542 4.157	0.462 0.347
R418503	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	20.42	0.41
			2	-	40.84	0.82
		2	1	North Europe (Mar – May)	2.99	0.06
			2		5.17	0.10
			1	South Europe (Mar – May)	5.97	0.12
			2		10.33	0.21
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	20.42	0.41
			2	-	40.84	0.82
		2	1	North Europe (Jun-Sep)	2.99	0.06
			2		5.17	0.10
			1	South Europe (Mar – May)	5.97	0.12
			2		10.33	0.21
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	27.23	0.54
		2	1	North Europe (Jun-Sep)	1.49	0.03
			1	South Europe (Jun-Sep)	2.24	0.04
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	20.474	0.012
		2	1	South Europe Mar – May June-Sept.	1.123 1.123	0.001 0.001
			1	North Europe Mar – May June-Sept.	2.245 1.684	0.001 0.001
R419492	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	43.74	< 0.01
			2	-	87.49	< 0.01
		2	1	North Europe (Mar – May)	6.95	< 0.01
			2		13.72	< 0.01
			1	South Europe (Mar – May)	13.90	< 0.01
			2		27.44	< 0.01
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	43.74	< 0.01
			2	-	87.49	< 0.01
		2	1	North Europe (Jun-Sep)	6.95	< 0.01
			2		13.72	< 0.01
			1	South Europe	13.90	< 0.01

Substance	Crop	Step	Number of applications	Region (Timing)	Max. PEC_{SW} [µg/L]	Max. PEC_{SED} [µg/kg]
			2	(Mar-May)	27.44	< 0.01
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	58.32	< 0.01
		2	1	North Europe (Jun-Sep)	3.47	< 0.01
			1	South Europe (Jun-Sep)	5.21	< 0.01
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	43.743	< 0.001
		2	1	South Europe Mar – May June-Sept.	2.261 2.605	< 0.001 < 0.001
			1	North Europe Mar – May June-Sept.	5.211 3.908	< 0.001 < 0.001
R471811	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	41.34	< 0.01
			2	-	82.68	< 0.01
		2	1	North Europe (Mar – May)	6.58	< 0.01
			2		13.06	< 0.01
			1	South Europe (Mar – May)	13.17	< 0.01
			2		26.12	< 0.01
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	41.34	< 0.01
			2	-	82.68	< 0.01
		2	1	North Europe (Jun-Sep)	6.58	< 0.01
			2		13.06	< 0.01
			1	South Europe (Mar – May)	13.17	< 0.01
			2		26.12	< 0.01
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	55.12	< 0.01
		2	1	North Europe (Jun-Sep)	3.29	< 0.01
			1	South Europe (Jun-Sep)	4.94	< 0.01
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	41.342	< 0.001
		2	1	South Europe Mar – May June-Sept.	2.469 6.172	< 0.001 < 0.001
			1	North Europe Mar – May June-Sept.	4.937 3.703	< 0.001 < 0.001
SYN507900	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	14.18	2.23
			2	-	28.36	4.45
		2	1	North Europe (Mar – May)	2.23	0.35
			2		4.35	0.68
			1	South Europe (Mar – May)	4.47	0.70
			2		8.70	1.37
	Spring cereals	1	1	-	14.18	2.23

Substance	Crop	Step	Number of applications	Region (Timing)	Max. PEC_{SW} [µg/L]	Max. PEC_{SED} [µg/kg]
	(2 x 750 g a.s./ha, BBCH 30 - 69)		2	-	28.36	4.45
		2	1	North Europe (Jun-Sep)	2.23	0.35
			2		4.35	0.68
			1	South Europe (Mar-May)	4.47	0.70
			2		8.70	1.37
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	18.91	2.97
		2	1	North Europe (Jun-Sep)	1.12	0.18
			1	South Europe (Jun-Sep)	1.68	0.26
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	14.182	2.227
		2	1	South Europe Mar – May June-Sept.	0.838 0.838	0.132 0.132
			1	North Europe Mar – May June-Sept.	1.676 1.257	0.263 0.197
SYN546671	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	46.59	< 0.01
			2	-	93.18	< 0.01
		2	1	North Europe (Mar – May)	5.03	< 0.01
			2		6.31	< 0.01
			1	South Europe (Mar – May)	8.83	< 0.01
			2		10.50	< 0.01
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	46.59	< 0.01
			2	-	93.18	< 0.01
		2	1	North Europe (Jun-Sep)	5.03	< 0.01
			2		6.31	< 0.01
			1	South Europe (Mar-May)	8.83	< 0.01
			2		10.50	< 0.01
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	62.12	< 0.01
		2	1	North Europe (Jun-Sep)	3.54	< 0.01
			1	South Europe (Jun-Sep)	4.49	< 0.01
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	46.588	< 0.001
		2	1	South Europe Mar – May June-Sept.	2.655 2.655	< 0.001 < 0.001
			1	North Europe Mar – May June-Sept.	4.080 3.367	< 0.001 < 0.001
SYN546934	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	17.89	< 0.01
			2	-	35.78	< 0.01
		2	1	North Europe	1.94	< 0.01

Substance	Crop	Step	Number of applications	Region (Timing)	Max. PEC_{SW} [µg/L]	Max. PEC_{SED} [µg/kg]
			2	(Mar – May)	2.45	< 0.01
			1	South Europe (Mar – May)	3.40	< 0.01
			2		4.07	< 0.01
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	17.89	< 0.01
			2	-	35.78	< 0.01
		2	1	North Europe (Jun-Sep)	1.94	< 0.01
			2		2.45	< 0.01
			1	South Europe (Mar-May)	3.40	< 0.01
			2		4.07	< 0.01
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	23.86	< 0.01
		2	1	North Europe (Jun-Sep)	1.37	< 0.01
			1	South Europe (Jun-Sep)	1.73	< 0.01
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	17.891	< 0.001
		2	1	South Europe Mar – May June-Sept.	1.026 1.026	< 0.001 < 0.001
			1	North Europe Mar – May June-Sept.	1.574 1.300	< 0.001 < 0.001

Substance	Crop	Step	Number of applications	Region (Timing)	Max. PEC_{SW} [µg/L]	Max. PEC_{SED} [µg/kg]
R611965	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	32.64	5.10
			2	-	65.29	10.20
		2	1	North Europe (Mar – May)	5.19	0.81
			2		10.24	1.60
			1	South Europe (Mar – May)	10.37	1.62
			2		20.48	3.20
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	32.64	5.10
			2	-	65.29	10.20
		2	1	North Europe (Jun-Sep)	5.19	0.81
			2		10.24	1.60
			1	South Europe (Mar-May)	10.37	1.62
			2		20.48	3.20
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	43.52	6.80
		2	1	North Europe (Jun-Sep)	2.59	0.40
			1	South Europe (Jun-Sep)	3.89	0.61
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	17.891	< 0.001
		2	1	South Europe Mar – May June-Sept.	1.945 1.945	0.304 0.304
			1	North Europe Mar – May June-Sept.	3.889 2.917	0.608 0.456
R611966 surrogate K_{FOC} (235 mL/g)	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	24.46	57.25
			2	-	48.93	114.50
		2	1	North Europe (Mar – May)	3.33	7.76
			2		5.59	13.04
			1	South Europe (Mar – May)	6.37	14.90
			2		10.68	24.98
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	24.46	57.25
			2	-	48.93	114.50
		2	1	North Europe (Jun-Sep)	3.33	7.76
			2		5.59	13.04
			1	South Europe (Mar-May)	6.37	14.90
			2		10.68	24.98
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	32.62	76.33
		2	1	North Europe (Jun-Sep)	1.90	4.40
			1	South Europe (Jun-Sep)	2.66	6.18
	Potatoes (1x750 g a.s./ha,	2	1	North Europe Mar – May June-Sept.	24.463	56.666

Substance	Crop	Step	Number of applications	Region (Timing)	Max. PEC_{SW} [µg/L]	Max. PEC_{SED} [µg/kg]
	BBCH 40-85	2	1	South Europe Mar – May June-Sept.	1.428 1.428	3.300 3.300
			1	North Europe Mar – May June-Sept.	2.568 1.998	5.977 4.639
R611966 measured K_{FOC} (563 mL/g)	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	18.44	102.90
			2	-	36.88	205.79
		2	1	North Europe (Mar – May)	2.51	13.95
			2		4.22	23.43
			1	South Europe (Mar – May)	4.79	26.78
			2		8.04	44.89
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	18.44	102.90
			2	-	36.88	205.79
		2	1	North Europe (Jun-Sep)	2.51	13.95
			2		4.22	23.43
			1	South Europe (Mar-May)	4.79	26.78
			2		8.04	44.89
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	24.59	137.19
		2	1	North Europe (Jun-Sep)	1.45	7.91
			1	South Europe (Jun-Sep)	2.02	11.12
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	18.439	101.843
		2	1	South Europe Mar – May June-Sept.	1.088 1.088	5.931 5.931
			1	North Europe Mar – May June-Sept.	1.943 1.515	10.742 8.337
R611967 surrogate K_{FOC} (235 mL/g)	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	23.58	55.41
			2	-	47.15	110.81
		2	1	North Europe (Mar – May)	3.40	7.98
			2		5.75	13.52
			1	South Europe (Mar – May)	6.80	15.97
			2		11.51	27.04
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	23.58	55.41
			2	-	47.15	110.81
		2	1	North Europe (Jun-Sep)	3.40	7.98
			2		5.75	13.52
			1	South Europe (Mar-May)	6.80	15.97
			2		11.51	27.04
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	31.44	73.88
		2	1	North Europe (Jun-Sep)	1.70	3.99

Substance	Crop	Step	Number of applications	Region (Timing)	Max. PEC_{SW} [µg/L]	Max. PEC_{SED} [µg/kg]
			1	South Europe (Jun-Sep)	2.55	5.99
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	23.577	55.407
		2	1	South Europe Mar – May June-Sept.	1.274 1.274	2.994 2.994
			1	North Europe Mar – May June-Sept.	2.548 1.911	5.988 4.491
R611967 measured K_{FOC} (425 mL/g)	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	19.76	84.00
			2	-	39.53	168.00
		2	1	North Europe (Mar – May)	2.85	12.10
			2		4.82	20.50
			1	South Europe (Mar – May)	5.70	24.21
			2		9.65	41.00
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	19.76	84.00
			2	-	39.53	168.00
		2	1	North Europe (Jun-Sep)	2.85	12.10
			2		4.82	20.50
			1	South Europe (Mar-May)	5.70	24.21
			2		9.65	41.00
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	26.35	112.00
		2	1	North Europe (Jun-Sep)	1.42	6.05
			1	South Europe (Jun-Sep)	2.14	9.08
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	19.765	84.001
		2	1	South Europe Mar – May June-Sept.	1.068 1.068	4.539 4.539
			1	North Europe Mar – May June-Sept.	2.136 1.602	9.079 6.809
R611968 surrogate K_{FOC} (15.7 mL/g)	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	15.89	2.50
			2	-	31.79	4.99
		2	1	North Europe (Mar – May)	2.42	0.38
			2		4.45	0.70
			1	South Europe (Mar – May)	4.84	0.76
			2		8.89	1.40
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	15.89	2.50
			2	-	31.79	4.99
		2	1	North Europe (Jun-Sep)	2.42	0.38
			2		4.45	0.70
			1	South Europe	4.84	0.76

Substance	Crop	Step	Number of applications	Region (Timing)	Max. PEC_{SW} [µg/L]	Max. PEC_{SED} [µg/kg]
			2	(Mar-May)	8.89	1.40
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	21.19	3.33
		2	1	North Europe (Jun-Sep)	1.21	0.19
			1	South Europe (Jun-Sep)	1.81	0.28
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	15.893	2.495
		2	1	South Europe Mar – May June-Sept.	0.907 0.907	0.142 0.142
			1	North Europe Mar – May June-Sept.	1.814 1.360	0.285 0.214
R611968 measured K_{FOC} (62.93 mL/g)	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	14.97	9.42
			2	-	29.94	18.84
		2	1	North Europe (Mar – May)	2.28	1.43
			2		4.19	2.64
			1	South Europe (Mar – May)	4.56	2.87
			2		8.37	5.27
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	14.97	9.42
			2	-	29.94	18.84
		2	1	North Europe (Jun-Sep)	2.28	1.43
			2		4.19	2.64
			1	South Europe (Mar-May)	4.56	2.87
			2		8.37	5.27
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	19.96	12.56
		2	1	North Europe (Jun-Sep)	1.14	0.72
			1	South Europe (Jun-Sep)	1.71	1.08
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	14.970	9.421
		2	1	South Europe Mar – May June-Sept.	0.854 0.854	0.538 0.538
			1	North Europe Mar – May June-Sept.	1.708 1.281	1.075 0.806
R613636	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	121.60	283.58
			2	-	243.19	567.17
		2	1	North Europe (Mar – May)	14.14	32.65
			2		19.50	44.84
			1	South Europe (Mar – May)	25.37	59.04
			2		33.90	78.65
	Spring cereals	1	1	-	121.60	283.58

Substance	Crop	Step	Number of applications	Region (Timing)	Max. PEC_{SW} [µg/L]	Max. PEC_{SED} [µg/kg]
	(2 x 750 g a.s./ha, BBCH 30 - 69)		2	-	243.19	567.17
		2	1	North Europe (Jun-Sep)	14.14	32.65
			2		19.50	44.84
			1	South Europe (Mar-May)	25.37	59.04
			2		33.90	78.65
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	162.13	378.11
		2	1	North Europe (Jun-Sep)	9.48	21.55
			1	South Europe (Jun-Sep)	12.29	28.14
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	121.596	277.496
		2	1	South Europe Mar – May June-Sept.	7.112 7.112	16.160 16.160
			1	North Europe Mar – May June-Sept.	11.326 9.218	20.056 21.108
R613801 (PD2)	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	45.85	< 0.01
			2	-	91.70	< 0.01
		2	1	North Europe (Mar – May)	4.77	< 0.01
			2		5.53	< 0.01
			1	South Europe (Mar – May)	8.51	< 0.01
			2		9.66	< 0.01
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	45.85	< 0.01
			2	-	91.70	< 0.01
		2	1	North Europe (Jun-Sep)	4.77	< 0.01
			2		5.53	< 0.01
			1	South Europe (Mar-May)	8.51	< 0.01
			2		9.66	< 0.01
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	61.13	< 0.01
		2	1	North Europe (Jun-Sep)	3.24	< 0.01
			1	South Europe (Jun-Sep)	4.18	< 0.01
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	45.851	< 0.001
		2	1	South Europe Mar – May June-Sept.	2.432 2.432	< 0.001 < 0.001
			1	North Europe Mar – May June-Sept.	3.835 3.134	< 0.001 < 0.001
R613841	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	98.02	< 0.01
			2	-	196.05	< 0.01
		2	1	North Europe	10.48	< 0.01

Substance	Crop	Step	Number of applications	Region (Timing)	Max. PEC_{SW} [µg/L]	Max. PEC_{SED} [µg/kg]
			2	(Mar – May)	12.81	< 0.01
			1	South Europe (Mar – May)	18.48	< 0.01
			2		21.64	< 0.01
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	98.02	< 0.01
			2	-	196.05	< 0.01
		2	1	North Europe (Jun-Sep)	10.48	< 0.01
			2		12.81	< 0.01
			1	South Europe (Mar-May)	18.48	< 0.01
			2		21.64	< 0.01
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	130.70	< 0.01
		2	1	North Europe (Jun-Sep)	7.31	< 0.01
			1	South Europe (Jun-Sep)	9.31	< 0.01
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	98.024	< 0.001
		2	1	South Europe Mar – May June-Sept.	5.480 5.480	< 0.001 < 0.001
			1	North Europe Mar – May June-Sept.	8.479 6.980	< 0.001 < 0.001

Substance	Crop	Step	Number of applications	Region (Timing)	Max. PEC_{SW} [µg/L]	Max. PEC_{SED} [µg/kg]
R613842	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	33.40	< 0.01
			2	-	66.81	< 0.01
		2	1	North Europe (Mar – May)	3.55	< 0.01
			2		4.29	< 0.01
			1	South Europe (Mar – May)	6.28	< 0.01
			2		7.30	< 0.01
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	33.40	< 0.01
			2	-	66.81	< 0.01
		2	1	North Europe (Jun-Sep)	3.55	< 0.01
			2		4.29	< 0.01
			1	South Europe (Mar-May)	6.28	< 0.01
			2		7.30	< 0.01
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	44.54	< 0.01
		2	1	North Europe (Jun-Sep)	2.47	< 0.01
			1	South Europe (Jun-Sep)	3.15	< 0.01
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	103.635	< 0.001
		2	1	South Europe Mar – May June-Sept.	5.740 5.740	< 0.001 < 0.001
			1	North Europe Mar – May June-Sept.	8.910 7.325	< 0.001 < 0.001
PD1 (R613911)	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	23.22	< 0.01
			2	-	46.44	< 0.01
		2	1	North Europe (Mar – May)	2.52	< 0.01
			2		3.19	< 0.01
			1	South Europe (Mar – May)	4.41	< 0.01
			2		5.28	< 0.01
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	23.22	< 0.01
			2	-	46.44	< 0.01
		2	1	North Europe (Jun-Sep)	2.52	< 0.01
			2		3.19	< 0.01
			1	South Europe (Mar-May)	4.41	< 0.01
			2		5.28	< 0.01
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	30.96	< 0.01
		2	1	North Europe (Jun-Sep)	1.78	< 0.01
			1	South Europe (Jun-Sep)	2.25	< 0.01
	Potatoes (1x750 g a.s./ha,	2	1	North Europe Mar – May June-Sept.	23.232	< 0.001

Substance	Crop	Step	Number of applications	Region (Timing)	Max. PEC_{SW} [µg/L]	Max. PEC_{SED} [µg/kg]
	BBCH 40-85	2	1	South Europe Mar – May June-Sept.	1.333 1.333	< 0.001 < 0.001
			1	North Europe Mar – May June-Sept.	2.044 1.688	< 0.001 < 0.001
PD4	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	44.03	< 0.01
			2	-	88.06	< 0.01
		2	1	North Europe (Mar – May)	4.77	< 0.01
			2		6.04	< 0.01
			1	South Europe (Mar – May)	8.36	< 0.01
			2		10.01	< 0.01
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	44.03	< 0.01
			2	-	88.06	< 0.01
		2	1	North Europe (Jun-Sep)	4.77	< 0.01
			2		6.04	< 0.01
			1	South Europe (Mar-May)	8.36	< 0.01
			2		10.01	< 0.01
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	58.70	< 0.01
		2	1	North Europe (Jun-Sep)	3.37	< 0.01
			1	South Europe (Jun-Sep)	4.27	< 0.01
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	44.028	< 0.001
		2	1	South Europe Mar – May June-Sept.	2.523 2.526	< 0.001 < 0.001
			1	North Europe Mar – May June-Sept.	3.873 3.199	< 0.001 < 0.001
PD5 (SYN549430)	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	83.25	< 0.01
			2	-	166.50	< 0.01
		2	1	North Europe (Mar – May)	9.02	< 0.01
			2		11.42	< 0.01
			1	South Europe (Mar – May)	15.81	< 0.01
			2		18.92	< 0.01
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	83.25	< 0.01
			2	-	166.50	< 0.01
		2	1	North Europe (Jun-Sep)	9.02	< 0.01
			2		11.42	< 0.01
			1	South Europe (Mar-May)	15.81	< 0.01
			2		18.92	< 0.01
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	111.00	< 0.01
		2	1	North Europe (Jun-Sep)	6.37	< 0.01

Substance	Crop	Step	Number of applications	Region (Timing)	Max. PEC_{SW} [µg/L]	Max. PEC_{SED} [µg/kg]
			1	South Europe (Jun-Sep)	8.07	< 0.01
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	83.248	< 0.001
		2	1	South Europe Mar – May June-Sept.	4.776 4.776	< 0.001 < 0.001
			1	North Europe Mar – May June-Sept.	7.323 6.049	< 0.001 < 0.001
U38	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	17.80	< 0.01
			2	-	35.59	< 0.01
		2	1	North Europe (Mar – May)	1.93	< 0.01
			2		2.44	< 0.01
			1	South Europe (Mar – May)	3.38	< 0.01
			2		4.04	< 0.01
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	17.80	< 0.01
			2	-	35.59	< 0.01
		2	1	North Europe (Jun-Sep)	1.93	< 0.01
			2		2.44	< 0.01
			1	South Europe (Mar-May)	3.38	< 0.01
			2		4.04	< 0.01
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	23.73	< 0.01
		2	1	North Europe (Jun-Sep)	1.36	< 0.01
			1	South Europe (Jun-Sep)	1.72	< 0.01
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	17.795	< 0.001
		2	1	South Europe Mar – May June-Sept.	1.021 1.021	< 0.001 < 0.001
			1	North Europe Mar – May June-Sept.	1.565 1.293	< 0.001 < 0.001
U40	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	66.13	< 0.01
			2	-	132.27	< 0.01
		2	1	North Europe (Mar – May)	7.17	< 0.01
			2		9.07	< 0.01
			1	South Europe (Mar – May)	12.56	< 0.01
			2		15.03	< 0.01
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	66.13	< 0.01
			2	-	132.27	< 0.01
		2	1	North Europe (Jun-Sep)	7.17	< 0.01
			2		9.07	< 0.01
			1	South Europe	12.56	< 0.01

Substance	Crop	Step	Number of applications	Region (Timing)	Max. PEC_{SW} [µg/L]	Max. PEC_{SED} [µg/kg]
			2	(Mar-May)	15.03	< 0.01
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	88.18	< 0.01
		2	1	North Europe (Jun-Sep)	5.06	< 0.01
			1	South Europe (Jun-Sep)	6.41	< 0.01
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	66.133	< 0.001
		2	1	South Europe Mar – May June-Sept.	3.794 3.794	< 0.001 < 0.001
			1	North Europe Mar – May June-Sept.	5.817 4.806	< 0.001 < 0.001
U44	Winter cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	14.26	< 0.01
			2	-	28.53	< 0.01
		2	1	North Europe (Mar – May)	1.55	< 0.01
			2		1.96	< 0.01
			1	South Europe (Mar – May)	2.71	< 0.01
			2		3.24	< 0.01
	Spring cereals (2 x 750 g a.s./ha, BBCH 30 - 69)	1	1	-	14.26	< 0.01
			2	-	28.53	< 0.01
		2	1	North Europe (Jun-Sep)	1.55	< 0.01
			2		1.96	< 0.01
			1	South Europe (Mar-May)	2.71	< 0.01
			2		3.24	< 0.01
	Tomatoes (1 x 1000 g a.s./ha, BBCH 51 - 89)	1	1	-	19.02	< 0.01
		2	1	North Europe (Jun-Sep)	1.09	< 0.01
			1	South Europe (Jun-Sep)	1.38	< 0.01
	Potatoes (1x750 g a.s./ha, BBCH 40-85	2	1	North Europe Mar – May June-Sept.	14.263	< 0.001
		2	1	South Europe Mar – May June-Sept.	0.818 0.818	< 0.001 < 0.001
			1	North Europe Mar – May June-Sept.	1.255 1.037	< 0.001 < 0.001

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

Method of calculation	Not applicable

PEC

Maximum concentration	Not applicable

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				
Anas platyrhynchos (mallard duck)	a.s.	Acute	LD_{50}	**> 2000**
Anas platyrhynchos (mallard duck)	a.s.	Acute	LD_{50}	> 4640
Coturnix conturnix japonica (Japanese quail)	a.s.	Acute	LD_{50}	> 2000
Colinus virginianus (bobwhite quail)	Rover 500	Acute	LD_{50}	> 2000
Anas platyrhynchos (mallard duck)	SDS-3701	Acute	LD_{50}	**158**
	a.s.	Long-term	LD_{50}/10	> 200
Colinus virginianus (bobwhite quail)	a.s.	Long-term	NOAEL	58.2
Colinus virginianus (bobwhite quail)	a.s.	Long-term	NOAEL	158
Anas platyrhynchos (mallard duck)	a.s.	Long-term	NOAEL	726
Colinus virginianus (bobwhite quail)	a..s	Combined Long-term quail studies	$BMDL_5$	**119**
	SDS-3701	Long-term	LD_{50}/10	15.8
Colinus virginianus (bobwhite quail)	SDS-3701	Long-term	NOAEL	**10.1**
Anas platyrhynchos (mallard duck)	SDS-3701	Long-term	NOAEL	14.1
Mammals				
Rat	a.s.	Acute	LD_{50}	**> 5000**
Rat	Rover 500	Acute	LD_{50}	> 5000
Rat	A14111B	Acute	LD_{50}	> 5000
Rat	SDS-3701	Acute	LD_{50}	**242**
Rat	a.s.	Long-term (multigeneration)	NOAEL	**22.6**
Rat	SDS-3701	Long-term (multigeneration)	NOAEL	**1.5**

Endocrine disrupting properties (Annex Part A, points 8.1.5) The AMA suggested effects on thyroid of amphibians. A study from the public literature indicated that the metabolite, SDS-3701, interacts with the TRβ. There were no consistent indications of thyroid effects in the mammalian toxicology section. The RMS considers thyroid disruption in amphibians based on the available data, however a data gap can be identified for a more definitive study (LAGDA).
Additional higher tier studies (Annex Part A, points 10.1.1.2): From the residues section, a maximum plant residues value of 1.1 mg/kg fresh weight was used to estimate the exposure to plant food items for birds and mammals. For tomato, the maximum measured residues value from the residues section (0.02 mg/kg fresh weight) was also used. For non-plant food items, a level of 1.1 mg/kg was used initially, and refined using the PECsoil, accum of 0.351 mg/kg soil d.w. as a conservative value for seeds and arthropods. For chlorothalonil, the risk to frugivorous birds and mammals were addressed by using the default RUD value from EFSA (2009) for tomato rather than gourd in the risk assessment, since the only requested use in fruiting vegetables was for tomato.
Terrestrial vertebrate wildlife (birds, mammals, reptile and amphibians) (Annex Part A, points 8.1.4, 10.1.3): Acute and long-term risks to amphibians cannot be excluded based upon the available data. For more information please see the aquatic risk assessment. No information is available to assess the potential risk to reptiles.

* The endpoint was calculated according to the actual food consumption in the relevant study.

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

Cereals: 750 g a.s./ha x 2 (2nd app not before BBCH 40), Tomato: 1000 g a.s./ha x 1, Potato: 750 g a.s./ha x 1

A default residue level of 1.1 mg/kg plant weight (the highest measured plant residue from the residues section) was used to estimate the exposure to the plant metabolite SDS-3701. The residue level of 0.02 mg/kg fruit weight (the highest measured tomato residue from the residues section) was used for the level of residues in tomatoes. The highest soil PEC of 0.351 mg/kg soil dw was used to estimate the level in insects and seeds.

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
All - chlorothalonil	Small omnivorous bird	Acute	159	12.6	10
All – SDS-3710	Small omnivorous bird	Acute	2.486	63.6	10
Combined SDS-3701 and chlorothalonil	Small omnivorous bird	Acute	159	**7.46**	10
All - chlorothalonil	Small omnivorous bird	Long-term	36.1	**3.3**	5
All – SDS-3710	Small omnivorous bird	Long-term	2.486	**4.6**	5
Tier 1 (Birds) Chlorothalonil + SDS-3701					
Cereals BBCH 30-39	Small omnivorous bird	Acute	10.8	109.7	5
Fruiting vegetables BBCH 71-89	Frugivorous bird	Acute	57.4	20.3	5
Tier 1 (Birds) Chlorothalonil					
Cereals BBCH 30-39	Small omnivorous bird	Long-term	2.1465	55.4	5
Cereals BBCH ≥ 40	Small omnivorous bird	Long-term	1.8365	64.8	5
Fruiting vegetables BBCH 71-89	Frugivorous bird "crow"	Long-term	16.96	7.0	5
Fruiting vegetables BBCH ≥50	Small granivorous bird “finch”	Long-term	1.802	66.0	5

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Fruiting vegetables BBCH ≥50	Small omnivorous bird “lark”	Long-term	1.749	68.0	5
Fruiting vegetables BBCH 71-89	Frugivorous bird "starling"	Long-term	10.97	10.8	5
Fruiting vegetables BBCH ≥20	Small insectivorous bird “wagtail”	Long-term	5.14	23.1	5
Potato BBCH ≥ 40	Small omnivorous bird “lark”	Long-term	1.31	90.7	5
Potato BBCH ≥ 20	Small insectivorous bird “wagtail”	Long-term	3.86	30.9	5
Tier 1 (Birds) SDS-3701					
Cereals BBCH 30-39	Small omnivorous bird	Long-term	0.49608	17.7	5
Cereals BBCH ≥ 40	Small omnivorous bird	Long-term			
Fruiting vegetables BBCH 71-89	Frugivorous bird "crow"	Long-term	0.88722	1024.5	5
Fruiting vegetables BBCH ≥50	Small granivorous bird “finch”	Long-term	0.26712	32.8	5
Fruiting vegetables BBCH ≥50	Small omnivorous bird “lark”	Long-term	0.49608	17.7	5
Fruiting vegetables BBCH 71-89	Frugivorous bird "starling"	Long-term	1.54548	588.2	5
Fruiting vegetables BBCH ≥20	Small insectivorous bird “wagtail”	Long-term	0.75366	11.6	5
Potato BBCH ≥ 40	Small omnivorous bird “lark”	Long-term	0.572	17.7	5
Potato BBCH ≥ 20	Small insectivorous bird “wagtail”	Long-term	0.869	11.6	5
Higher tier (birds): No higher tier refinements were required, however, if refinements were required for the long-term risk to frugivorous bird, the RUD for tomatoes could be used in place of the RUD for gourds.					
Screening Step (Mammals)					
All, Chlorothalonil	Small herbivorous mammal “vole”	Acute	136.4	36.6	10
All, SDS-3701	Small herbivorous mammal “vole”	Acute	1.848	131	10
All, Chlorothalonil + SDS-3701	Small herbivorous mammal “vole”	Acute	159	14.5	10
All, Chlorothalonil	Small herbivorous mammal “vole”	Long-term	38.319	**0.59**	5
All, SDS-3701	Small herbivorous mammal “vole”	Long-term	0.97944	**1.5**	5
Tier 1 (Mammals) Chlorothalonil					
Cereals BBCH 30-39	Small omnivorous mammal “mouse”	Long-term	1.55025	14.58	5
Cereals BBCH ≥40		Long-term	1.27995	17.66	5
Cereals BBCH ≥50	Small herbivorous mammal “vole”	Long-term	12.07605	**1.87**	5
Cereals BBCH ≥20	Small insectivorous mammal “shrew”	Long-term	1.05735	21.37	5

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Fruiting vegetables BBCH 71-89	Frugivorous mammal “rat”	Long-term	13.356	**1.69**	5
Fruiting vegetables BBCH ≥50	Small omnivorous mammal mouse”	Long-term	1.219	18.54	5
Fruiting vegetables BBCH ≥50	Small herbivorous mammal “vole”	Long-term	11.501	**1.97**	5
Fruiting vegetables BBCH ≥20	Small insectivorous mammal “shrew”	Long-term	1.007	22.44	5
Potato BBCH ≥40	Small herbivorous mammal “vole”	Long-term	8.62575	**2.62**	5
Potato BBCH ≥40	Large herbivorous mammal “lagomorph”	Long-term	1.70925	13.22	5
Potato BBCH ≥40	Small omnivorous mammal mouse”	Long-term	0.91425	24.72	5
Potato BBCH ≥20	Small insectivorous mammal “shrew”	Long-term	0.75525	29.92	5
Tier 1 (Mammals) SDS-3701					
Cereals BBCH 30-39	Small omnivorous mammal “mouse”	Long-term	0.25758	5.1	5
Cereals BBCH ≥40		Long-term			
Cereals BBCH ≥50	Small herbivorous mammal “vole”	Long-term	1.26882	**1.9**	5
Cereals BBCH ≥20	Small insectivorous mammal “shrew”	Long-term	0.19305	7.8	5
Fruiting vegetables BBCH 71-89	Frugivorous mammal “rat”	Long-term	0.007738	193.8	5
Fruiting vegetables BBCH ≥50	Small omnivorous mammal mouse”	Long-term	0.25758	5.1	5
Fruiting vegetables BBCH ≥50	Small herbivorous mammal “vole”	Long-term	1.26882	**1.9**	5
Fruiting vegetables BBCH ≥20	Small insectivorous mammal “shrew”	Long-term	0.19305	7.8	5
Potato BBCH ≥40	Small herbivorous mammal “vole”	Long-term	0.77539	**1.9**	5
Potato BBCH ≥40	Large herbivorous mammal “lagomorph”	Long-term	0.2915	5.1	5
Potato BBCH ≥40	Small omnivorous mammal mouse”	Long-term	0.297	5.1	5
Potato BBCH ≥20	Small insectivorous mammal “shrew”	Long-term	0.19305	7.8	5
Higher tier (Mammals): To refine the risk to vole, a higher interception value (from FOCUS, 2014) was used for both chlorothalonil and SDS-3701. To refine the risk to frugivorous mammal for chlorothalonil, the default RUD from tomatoes was used (rather than gourds), however, this resulted in a high risk (TER = 4.6).					
Chlorothalonil					
Cereals BBCH ≥50	Small herbivorous mammal “vole”	Long-term	4.0068	5.64	5
Fruiting vegetables BBCH ≥50	Small herbivorous mammal “vole”	Long-term	7.632	**2.96**	5
Potato BBCH ≥40	Small herbivorous mammal “vole”	Long-term	4.0545	5.57	5
SDS-3701					

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Cereals BBCH ≥50	Small herbivorous mammal “vole”	Long-term	0.077539	19.3	5
Fruiting vegetables BBCH ≥50	Small herbivorous mammal “vole”	Long-term	0.155078	9.7	5
Potato BBCH ≥40	Small herbivorous mammal “vole”	Long-term	0.116309	12.9	5

Risk from bioaccumulation and food chain behaviour

Chlorothalonil has a log P_{OW} value of 2.94.
SDS-3701 (R182281) has an estimated log P_{OW} for the un-dissociated (neutral) form of 3.55. However, it is a strong acid with a pKa value of 0.7, thus, at environmentally relevant pHs the P_{OW} of SDS-3701 (R182281) is approximately 0.01 (log P_{OW} = -2.0).

Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger

Risk from consumption of contaminated water

Puddle scenario, Screening step

Chlorothalonil: 841.4 g a.s./ha/14 mg/kg bw/d or 22.6 mg/kg bw/d <3000 (koc≥500 L/kg), TER calculation not needed

For SDS-3701, long-term TER calculation is necessary.

Puddle scenario	Birds	Long-term	0.033166	211.06	5
Puddle scenario	Mammals	Long-term	0.017304	86.69	5

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] (mg a.s./L)
Laboratory tests				
Fish				
Oncorhynchus mykiss	chlorothalonil	Acute 96 hr (flow-through)	Mortality, LC_{50}	0.017 (mm)
Oncorhynchus mykiss	chlorothalonil	Acute 96 hr (flow-through)	Mortality, LC_{50}	0.039 (nom)
Salmo gairdneri	Chlorothalonil	Acute 96 hr (flow-through)	Mortality, LC_{50}	0.0171 (nom or mm)
Cyprinus carpio	Chlorothalonil	Acute 96 hr (flow-through)	Mortality, LC_{50}	0.060 (mm)
Cyprinodon variegatus	Chlorothalonil	Acute 96 hr (Semi-static)	Mortality, LC_{50}	0.028 (mm)
Galaxias maculatus	Chlorothalonil	Acute 96 hr (flow-through)	Mortality, LC_{50}	0.0163 (nom or mm)

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1] (mg a.s./L)
Galaxias truttaceus	Chlorothalonil	Acute 96 hr (flow-through)	Mortality, LC_{50}	0.0189 (nom or mm)
Galaxias auratus	Chlorothalonil	Acute 96 hr (flow-through)	Mortality, LC_{50}	0.0292 (nom or mm)
Gasterosteus aculeatus	Chlorothalonil	Acute 96 hr	Mortality, LC_{50}	0.027
Pimephales promelas	Chlorothalonil	Acute 96 hr (Semi-static)	Mortality, LC_{50}	0.0226 (nom)
Pagrus major	Chlorothalonil	Acute 96 hr (flow-through)	Mortality, LC_{50}	0.035 (mm)
Fundulus heteroclitus	chlorothalonil	Acute 96 hr (flow-through)	Mortality, LC_{50}	0.061 (mm)
Oncorhynchus mykiss	chlorothalonil	Acute 48 hr (static water/sediment)	Mortality, LC50	0.0044 (mm)#
Oncorhynchus mykiss	A14111B[2]	Acute 96 hr (static)	Mortality, LC_{50}	0.021* (equals 0.061 mg form/L) (mm)
Lepomis macrochirus	BRAVO 720[3]	Acute 96 hr (flow-through)	Mortality, LC_{50}	0.046 (equals 0.064 mg form/L) (mm)
Salmo gairdneri	Rover 500[4]	Acute 96 hr (flow-through)	Mortality, LC_{50}	0.20 (equals 0.40 mg form/L) (nom)
Cyprinus carpio	Rover 500[4]	Acute 96 hr (flow-through)	Mortality, LC_{50}	0.11 (equals 0.21 mg form/L)(nom)
Oncorhynchus mykiss	Chlorothalonil	Chronic (flow-through)	Juvenile growth test, 21-d NOEC	0.0069 (mm)
Pimephales promelas	Chlorothalonil	Chronic (flow-through)	ELS test (extended over two generations) 45 weeks EC10	**0.0014 (mm)**
Pimephales promelas	Chlorothalonil	Chronic (flow-through)	Fish short term reproduction assay 21-d NOEC	<0.000078 (mm)
Fundulus heteroclitus	Chlorothalonil	Chronic (flow-through)	ELS test, 8-weeks NOEC	0.011 (mm)

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1] (mg a.s./L)
Oncorhynchus mykiss	SDS-3701	Acute 96 hr (semi-static)	Mortality, LC_{50}	9.1 (mm)
Oncorhynchus mykiss	SDS-46851	Acute 96 hr (static)	Mortality, LC_{50}	>120 (nom)
Oncorhynchus mykiss	R417888	Acute 96 hr (static)	Mortality, LC_{50}	>100 (nom)
Oncorhynchus mykiss	SDS-19221	Acute 96 hr (static)	Mortality, LC_{50}	18 (nom)
Oncorhynchus mykiss	SDS-67042	Acute 96 hr (flow-through)	Mortality, LC_{50}	>0.83 (mm)
Oncorhynchus mykiss	SDS-67042 sulfoxide	Acute 96 hr (flow-through)	Mortality, LC_{50}	>0.99 (mm)
Amphibians				
Xenopis laevis (larvae)	chlorothalonil	Acute 96 hr (semi-static)	Mortality, LC_{50}	0.0082 and 0.0144 (2 experiments)
Spea multiplicata	chlorothalonil	Acute 96 hr (semi-static)	Mortality, LC_{50}	**0.0107**
Xenopis laevis	chlorothalonil	Chronic (flow-through)	Amphibian metamorphosis, 21-d NOEC	Screening assay indicates effects at ~0.00061
Aquatic invertebrates				
Daphnia magna	chlorothalonil	48 h (static)	Mortality, EC_{50}	0.054 (mm)
Crassostrea virginica	Chlorothalonil	96 h (flow-through)	Mortality, LC50	**0.005 (mm)**
Amphiascus tenuiremis	Chlorothalonil	96 h (static)	Mortality, LC50	0.027 (mm)
Lampsilis siliquiidea	Chlorothalonil	48 h (semi-static)	Mortality, EC_{50}	0.040 (mm)
Tigriopus japonicas	Chlorothalonil	24 h (static)	Mortality, EC_{50}	0.016 (mm)
Ceriodaphnia dubia	chlorothalonil	96 h (semi-static)	Mortality, LC_{50}	0.156 (nom)
Daphnia magna	A14111B[2]	48 h (static)	Mortality, EC_{50}	0.12* (equals 0.35 mg form/L) (mm)
Mysidopsis bahia	chlorothalonil	28 d (flow-through)	Reproduction, NOEC	**0.0004** (mm)
Mysidopsis bahia	SDS-3701	96 h		19
Chironomus riparius	SDS-3701	48 h		76
Daphnia magna	SDS-46851	48 h (static)	Mortality, EC_{50}	>123.6 (mm)
Daphnia magna	SDS-46851	48 h (static)	Mortality, EC_{50}	>100 (nom)

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1] (mg a.s./L)
Daphnia magna	R417888	48 h (static)	Mortality, EC_{50}	>110 (mm)
Daphnia magna	SDS-19221	48 h (static)	Mortality, EC_{50}	12.4 (mm)
Daphnia magna	SDS-67042	48 h (flow-through)	Mortality, EC_{50}	>0.94 (mm)
Daphnia magna	SDS-67042	48 h (flow-through)	Mortality, EC_{50}	>0.89 (mm)
Daphnia magna	R613801	48 h (static)	Mortality, EC_{50}	0.56 (mm)
Sediment-dwelling organisms				
Chironomus riparius	Chlorothalonil (water-spiked)	28 d (static)	NOEC	**0.040 (mm)**
Chironomus dilutus	Chlorothalonil (sediment-spiked)	10 d (semi-static)	LC10	9.4 mg as/kg sed (mm)
Hyalella azteca	Chlorothalonil (sediment-spiked)	10 d (semi-static)	NOEC	7.5 mg as/kg sed (mm)
Leptocheirus plumulosus	Chlorothalonil (sediment-spiked)	10 d	NOEC	100 mg as/kg sed (nom)
Algae				
Navicula pelliculosa	chlorothalonil	72 h (static)	Growth rate: E_rC_{50} (NOEC) Biomass: E_bC_{50} (NOEC)	**0.013** (nom) 0.0035 (nom) 0.0051 (nom) 0.0018 (nom)
Navicula pelliculosa	chlorothalonil	72 h (static)	Growth rate: E_rC_{50} (NOEC) Biomass: E_bC_{50} (NOEC) Yield: E_yC_{50} (NOEC)	0.025 (mm) 0.00075 (mm) 0.0069 (mm) 0.00075 (mm) 0.0074 (mm) 0.00075 (mm)
Navicula pelliculosa	chlorothalonil	120 h (static) (water/sediment system)	Growth rate: E_rC_{50} (NOEC) Biomass: E_bC_{50} (NOEC)	>0.096 (nom)[#] 0.096 (nom)[#] 0.069 (nom)[#] 0.048 (nom)[#]

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1] (mg a.s./L)
Anabaena flos-aquae	chlorothalonil	72 h (static)	Growth rate: E_rC_{50} (NOEC) Biomass: E_bC_{50} (NOEC) Yield: E_yC_{50} (NOEC)	0.142 (mm) 10 (mm) 0.053 (mm) <10 (mm) 0.044 (mm) <10 (mm)
Pseudokirchneriella subcapitata	A14111B[2]	72 h (static)	Growth rate: E_rC_{50} (NOEC) Biomass: E_bC_{50} (NOEC) Yield: E_yC_{50} (NOEC)	0.20* (mm) (equals 0.58 mg form/L) <0.011* (mm) (equals <0.033 mg form/L) 0.037* (mm) (equals 0.11 mg form/L) <0.011* (mm) (equals <0.033 mg form/L) 0.033* (mm) (equals 0.095 mg form/L) <0.011* (mm) (equals <0.033 mg form/L)
Pseudokirchneriella subcapitata	Rover 500[4]	72 h (static)	Growth rate: E_rC_{50} (EC10) Biomass: E_bC_{50} (EC10) Yield: E_yC_{50} (EC10)	0.43 (mm) (equals 1.1 mg form/L) 0.036 (mm) (equals 0.091 mg form/L) 0.042 (mm) (equals 0.11 mg product/L) (0.0029 (mm) (equals 0.0074 mg form/L) 0.035 (mm) (equals 0.089 mg form/L) 0.0022 (mm) (equals 0.0056 mg form/L)

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1] (mg a.s./L)
Pseudokirchneriella subcapitata	Chlorothalonil 75 WG[5]	72 h (static)	Growth rate: E_rC_{50} (NOEC) Biomass: E_bC_{50} (NOEC)	0.33 (nom) (equals 0.43 mg form/L) - 0.16 (nom) (equals 0.21 mg form/L) 0.019 (nom) (equals 0.014 mg form/L)
Pseudokirchneriella subcapitata	SDS-46851	72 h (static)	Growth rate: E_rC_{50} (NOEC) Biomass: E_bC_{50} (NOEC)	55 (mm) 45 (mm) 36 (mm)
Pseudokirchneriella subcapitata	SDS-46851	72 h (static)	Growth rate: E_rC_{50} (NOEC) Biomass: E_bC_{50} (NOEC) Yield: E_yC_{50} (NOEC)	>45 (nom) 45 (nom) >45 (nom) 45 (nom) >45 (nom)
Pseudokirchneriella subcapitata	R417888	72 h (static)	Growth rate: E_rC_{50} (NOEC) [Biomass: E_bC_{50} (NOEC)	>100 (nom) 100 (nom) >100 (nom) 100 (nom)
Pseudokirchneriella subcapitata	R417888	72 h (static)	Growth rate: E_rC_{50} (NOEC) Biomass: E_bC_{50} (NOEC) Yield: E_yC_{50} (NOEC)	>100 (nom) <4.6 (nom) >100 (nom) <4.6 (nom) >100 (nom) <4.6 (nom)
Pseudokirchneriella subcapitata	SDS-19221	72 h (static)	Growth rate: E_rC_{50} (NOEC) Biomass: E_bC_{50} (NOEC)	12 (nom) 0.32 (nom) 5 (nom) 0.32 (nom)
Pseudokirchneriella subcapitata	SDS-67042	72 h (static)	Growth rate: E_rC_{50} (EC10) Biomass: E_bC_{50} (EC10) Yield: E_yC_{50} (NOEC)	>0.041 (mm) 0.000079 (mm) 0.00086 (mm) 0.000013 (mm) 0.00092 (mm) 0.000009 (mm)

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1] (mg a.s./L)
Pseudokirchneriella subcapitata	SDS-67042	72 h (static)	Growth rate: E_rC_{50} (NOEC) Biomass: E_bC_{50} (NOEC) Yield: E_yC_{50} (NOEC)	1.3 (mm) 0.0062 (mm) 0.12 (mm) 0.0062 (mm) 0.14 (mm) 0.0062 (mm)
Navicula pelliculosa	SDS-67042	72 h (static)	Growth rate: E_rC_{50} (NOEC) Biomass: E_bC_{50} (NOEC) Yield: E_yC_{50} (NOEC)	0.117 (mm) 0.042 (mm) 0.060 (mm) 0.029 (mm) 0.065 (mm) 0.029 (mm)
Pseudokirchneriella subcapitata	SDS-67042 Sulfoxide	72 h (static)	Growth rate: E_rC_{50} (NOEC) Biomass: E_bC_{50} (NOEC)	>0.88 (mm) 0.88 (mm) >0.88 (mm) 0.88 (mm)
Pseudokirchneriella subcapitata	R613801	72 h (static)	Growth rate: E_rC_{50} (NOEC) Biomass: E_bC_{50} (NOEC) Yield: E_yC_{50} (NOEC)	0.38 (mm) 0.023 (mm) 0.17 (mm) 0.023 (mm) 0.11 (mm) 0.013 (mm)
Higher plant				
Lemna gibba	chlorothalonil	14 d (static)	Fronds number, EC_{50} (NOEC) dry weight, E_rC_{50} (NOEC)	0.720 (mm) 0.290 (mm) 0.510 (mm) 0.290 (mm)
Lemna gibba	chlorothalonil	7 d (static)	Fronds number, E_rC_{50} (NOEC) Fronds number, E_yC_{50} (NOEC) dry weight, E_rC_{50} (NOEC) dry weight, E_yC_{50} (NOEC)	0.797 (mm) 0.005 (mm) **0.187** (mm) 0.005 (mm) 0.421 (mm) 0.005 (mm) 0.134 (mm) 0.005 (mm)

<table>
<tr><th>Group</th><th>Test substance</th><th>Time-scale
(Test type)</th><th>End point</th><th>Toxicity[1]
(mg a.s./L)</th></tr>
<tr><td colspan="5">Further testing on aquatic organisms

To address the acute risk to fish an SSD (fish) was calculated (ETX 2.1), resulting in a median HC5 of 13.6 µg/L (95% C.I. 7.95 -18.48). By applying an assessment factor of 9 this results in a RAC of 1.5 µg/L.

To address the chronic risk to fish a pulsed dose study (Schneider et al., 2017) was submitted in combination with modelled exposure patterns of selected STEP 4 simulations. However, this pulsed dose study was not accepted as a refinement by the Pesticides Peer review Meeting 165 (18-22 September 2017).

To address the acute and chronic risk to invertebrates' mesocosm data was used. Two mesocosm studies are available for chlorothalonil. The first study (3 applications at 7 day intervals) (Tattersfield et al., 2002), which is part of the EU-DAR, has been re-evaluated and established endpoints with a NOEC of 3 µg a.s./L (based on class 1 effects only) and a NOEAEC of 10 µg a.s./L (based on class 2- 3A effects). A second study has been submitted (Schäfers 2005, single application). The NOEC (based on class 1 effects only) from this study was found to be < 4 µg a.s./L. The NOEAEC (based on class 2 – 3A effects) is 12.5 µg a.s./L.

For the uses in potatoes and tomatoes with only one application it is proposed to use the results of the study of Schäfers with only one application. The ERO-RAC is the endpoint of 12.5 µg a.s./L with an assessment factor of 4 is 3.1 µg a.s./L. The ETO-RAC can be taken from the study of Tattersfield et al, 2002 (see below), which is 1.0 µg a.s./L.

For the use in cereals (2 applications) it is proposed to take the results from the study of Tattersfield et al. into account. However, the exposure in this study is less worst-case than in the study of Schäfers. The NOEC based on only class 1 effects from this study is 3 µg a.s./L. Normally an assessment factor of 2 is applied to this value, but due to the uncertainty about the worst-casedness of the exposure in the study it is proposed to use an assessment factof of 3 in this case. The ETO-RAC is then 1 µg a.s./L. It is not deemed appropriate to derive a ERO-RAC from the study of Tattersfield, taking into account that the exposure in the study is possibly not realistic worst-case.

There is a study form public literature addressing the effect on non-target aquatic fungi (Dijksterhuis et al., 2011) which can be used as supplementary data. NOEC for Cryptococcus flavescens, Trichoderma hamatum, Fusarium sporotrichioides and Mucor hiemalis >0.26 mg chlorothalonil/L; NOEC for Pythium spp. isolates 1 and 2 >0.2 mg chlorothalonil/L. Based on nominal concentrations.</td></tr>
<tr><td colspan="5">Potential endocrine disrupting properties (Annex Part A, point 8.2.3)
The AMA test showed potential thyroid disruption at levels close to the regulatory RAC. As a results, a LAGDA test has been requested.This is identified as a data gap to address the long-term risk to amphibians.</td></tr>
</table>

[1] ($_{nom}$) nominal concentration; ($_{mm}$) mean measured concentration; prep.: preparation; a.s.: active substance
[2] A14111B: 80 g/L azoxystrobin (6.6%) and 419 g/L chlorothalonil (34.6% w/w)
[3] BRAVO 720: 720 g/L chlorothalonil (54% w/w)
[4] Rover 500, 500 g/L chlorothalonil (50% w/w)
[5] Chlorothalonil 75 WG: 720 g/Kg chlorothalonil (75.5% w/w)
*expressed in mg chlorothalonil/L
[#] not used in the risk assessment since it is a modified exposure study.

Bioconcentration in fish (Annex Part A, point 8.2.2.3)

	Active substance
$\log P_{O/W}$	2.94
Steady-state bioconcentration factor (BCF) (total wet weight/normalised to 5% lipid content)	2300* <100**
Uptake/depuration kinetics BCF (total wet weight/normalised to 5% lipid content)	
Annex VI Trigger for the bioconcentration factor	
Clearance time (days) (CT_{50})	
(CT_{90})	
Level and nature of residues (%) in organisms after the 14 day depuration phase	

* based on total ^{14}C, consisting of a large number of components (no unmetabolised chlorothalonil was detected)
**based on the identity of the radioactivity in fish

Toxicity/exposure ratios for the most sensitive aquatic organisms (Regulation (EU) N° 284/2013, Annex Part A, point 10.2)

FOCUS$_{sw}$ step 1-3 - TERs for chlorothalonil – spring cereals at 750 g a.s./ha x 1

Scenario	PEC global max (µg L)	Fish acute	Fish acute	Fish chronic	Amphibians acute	Aquatic invertebrates	Aquatic invertebrates prolonged	Algae	Higher plant	Sed. dweller prolonged*	Microcosm / Mesocosm
			SSD	*Pimephales promelas*	*Spea multiplicata*	*Crassostrea virginica*	*Mysidopsis bahia*	*Navicula pelliculosa*	*Lemna gibba*	*Chironomus riparius*	
			HC_5	NOEC	LC50	EC_{50}	NOEC	EC_{50}	EC_{50}	NOEC	ETO-RAC
		16.3 µg/L	13.6 µg/L	1.4 µg/L	10.7 µg/L	5.0 µg/L	0.40 µg/L	13 µg/L	187 µg/L	40 µg/L	1.0 µg/L
FOCUS Step 1	98.9	**0.16**	**0.14**	**0.01**	**0.11**	**0.05**	**0.004**	**0.13**	**1.89**	**0.40**	**0.01**
FOCUS Step 2											
North Europe	9.0	**1.81**	**1.51**	**0.16**	**1.19**	**0.56**	**0.04**	**1.44**	20.8	**4.44**	**0.11**
South Europe	16.7	**0.98**	**0.81**	**0.08**	**0.64**	**0.30**	**0.02**	**0.78**	11.2	**2.40**	**0.06**
FOCUS Step 3											
D1 Ditch	4.80	**3.4**	**2.83**	**0.29**	**2.2**	**1.04**	**0.083**	**2.71**	39.0	**8.33**	**0.21**
D1 Stream	4.20	**3.9**	**3.24**	**0.33**	**2.5**	**1.19**	**0.095**	**3.10**	44.5	**9.52**	**0.24**
D3 Ditch	4.76	**3.4**	**2.86**	**0.29**	**2.2**	**1.05**	**0.084**	**2.73**	39.3	**8.40**	**0.21**
D4 Pond	0.164	**99.4**	82.9	**8.54**	**65.2**	**30.49**	**2.439**	79.27	1140	244	6.10
D4 Stream	4.09	**4.0**	**3.32**	**0.34**	**2.6**	**1.22**	**0.098**	**3.18**	45.6	**9.76**	**0.24**
D5 Pond	0.164	**99.4**	82.9	**8.54**	**65.2**	**30.49**	**2.439**	79.27	1140	244	6.10
D5 Stream	4.42	**3.7**	**3.08**	**0.32**	**2.4**	**1.13**	**0.092**	**2.94**	42.3	**9.17**	**0.23**
R4 Stream	3.14	**5.2**	**4.33**	**0.45**	**3.4**	**1.59**	**0.127**	**4.14**	59.6	12.7	**0.32**
Trigger		100	9	10	100	100	10	10	10	10	1

*Also an endpoint from a sediment spiked test with Hyalella azteca is available. The endpoint is 7.5 mg/kg sediment. Hence, the RAC is 0.75 mg/kg sediment (=750 µg/kg sediment). Comparing this value with the highest FOCUS Step 3 PECsed value of 5.31 µg/kg sediment, the PEC/RAC = 0.0071. Hence, the risk is low for this use.

FOCUS$_{sw}$ step 1-3 - TERs for chlorothalonil – spring cereals at 750 g a.s./ha x 2

Scenario	PEC global max (µg L)	Fish acute	Fish acute	Fish chronic	Amphibians acute	Aquatic invertebrates	Aquatic invertebrates prolonged	Algae	Higher plant	Sed. dweller prolonged*	Microcosm / Mesocosm
			SSD	*Pimephales promelas*	*Spea multiplicata*	*Crassostrea virginica*	*Mysidopsis bahia*	*Navicula pelliculosa*	*Lemna gibba*	*Chironomus riparius*	
			HC_5	NOEC	LC50	EC_{50}	NOEC	EC_{50}	EC_{50}	NOEC	ETO-RAC
		16.3 µg/L	13.6 µg/L	1.4 µg/L	10.7 µg/L	5.0 µg/L	0.40 µg/L	13 µg/L	187 µg/L	40 µg/L	1.0 µg/L
FOCUS Step 1	197.8	**0.08**	**0.07**	**0.01**	**0.05**	**0.03**	**0.002**	**0.07**	**0.95**	**0.20**	**0.005**
FOCUS Step 2											
North Europe	9.8	**1.66**	**1.39**	**0.14**	**1.09**	**0.51**	**0.04**	**1.33**	19.1	**4.08**	**0.10**
South Europe	18.3	**0.89**	**0.74**	**0.08**	**0.58**	**0.27**	**0.02**	**0.71**	10.2	**2.19**	**0.05**
FOCUS Step 3											
D1 Ditch	5.93	**2.7**	**2.29**	**0.27**	**1.80**	**0.84**	**0.07**	**2.19**	31.5	**6.75**	**0.17**
D1 Stream	3.63	**4.5**	**3.75**	**0.39**	**2.95**	**1.38**	**0.11**	**3.58**	51.5	11.0	**0.28**
D3 Ditch	4.16	**3.9**	**3.27**	**0.34**	**2.57**	**1.20**	**0.10**	**3.13**	45.0	**9.62**	**0.24**
D4 Pond	0.229	**71.2**	59.4	**6.11**	**46.72**	**21.8**	**1.75**	56.8	816	174.4	4.37
D4 Stream	3.55	**4.6**	**3.83**	**0.39**	**3.01**	**1.41**	**0.11**	**3.66**	52.7	11.3	**0.28**
D5 Pond	0.231	**70.6**	58.9	**6.06**	**46.32**	**21.7**	**1.73**	56.3	809	173.2	4.33
D5 Stream	3.83	**4.3**	**3.55**	**0.37**	**2.79**	**1.31**	**0.10**	**3.39**	48.8	10.4	**0.26**
R4 Stream	5.07	**3.2**	**2.68**	**0.28**	**2.11**	**0.99**	**0.08**	**2.56**	36.9	**7.9**	**0.20**
Trigger		100	9	10	100	100	10	10	10	10	1

*Also an endpoint from a sediment spiked test with *Hyalella azteca* is available. The endpoint is 7.5 mg/kg sediment. Hence, the RAC is 0.75 mg/kg sediment (=750 µg/kg sediment). Comparing this value with the highest FOCUS Step 3 PECsed value of 7.13 µg/kg sediment, the PEC/RAC = 0.0095. Hence, the risk is low for this use.

FOCUS$_{sw}$ step 1-3 - TERs for chlorothalonil – winter cereals at 750 g a.s./ha x 1

Scenario	PEC global max (µg L)	Fish acute	Fish acute	Fish chronic	Amphibians acute	Aquatic invertebrates	Aquatic invertebrates-prolonged	Algae	Higher plant	Sed. dweller prolonged*	Microcosm / Mesocosm
			SSD	*Pimephales promelas*	*Spea multiplicata*	*Crassostrea virginica*	*Mysidopsis bahia*	*Navicula pelliculos*	*Lemna gibba*	*Chironomus riparius*	

								a			
			HC_5	NOEC	LC50	EC_{50}	NOEC	EC_{50}	EC_{50}	NOEC	ETO-RAC
		16.3 µg/L	13.6 µg/L	1.4 µg/L	10.7 µg/L	5.0 µg/L	0.40 µg/L	13 µg/L	187 µg/L	40 µg/L	1.0 µg/L
FOCUS Step 1	98.9	**0.16**	**0.14**	**0.01**	**0.11**	**0.05**	**0.004**	**0.13**	**1.89**	**0.40**	**0.01**
FOCUS Step 2											
North Europe	9.0	**1.81**	**1.51**	**0.16**	**1.19**	**0.56**	**0.04**	**1.44**	20.8	**4.44**	**0.11**
South Europe	16.7	**0.98**	**0.81**	**0.08**	**0.64**	**0.30**	**0.02**	**0.78**	11.2	**2.40**	**0.06**
FOCUS Step 3											
D1 Ditch	4.76	**3.4**	**2.86**	**0.29**	**2.2**	**1.05**	**0.08**	**2.73**	39.3	**8.4**	**0.21**
D1 Stream	3.70	**4.4**	**3.68**	0.38	**2.9**	**1.35**	**0.11**	**3.51**	50.5	11.1	**0.27**
D2 Ditch	4.78	**3.4**	**2.85**	**0.29**	**2.2**	**1.05**	**0.08**	**2.72**	39.1	**8.4**	**0.21**
D2 Stream	3.95	**4.1**	**3.44**	**0.35**	**2.7**	**1.27**	**0.10**	**3.29**	47.3	10.6	**0.25**
D3 Ditch	4.74	**3.4**	**2.87**	**0.30**	**2.3**	**1.05**	**0.08**	**2.74**	39.5	**8.4**	**0.21**
D4 Pond	0.164	**99.4**	82.9	**8.54**	**65.2**	**30.49**	**2.44**	79.3	1140	244	6.10
D4 Stream	3.51	**4.6**	**3.87**	**0.40**	**3.0**	**1.42**	**0.11**	**3.70**	53.3	**11.2**	**0.28**
D5 Pond	0.164	**99.4**	82.9	**8.54**	**65.2**	**30.49**	**2.44**	79.3	1140	244	6.10
D5 Stream	3.79	**4.3**	**3.59**	**0.37**	**2.8**	**1.32**	**0.11**	**3.43**	49.3	10.5	**0.26**
D6 Ditch	4.79	**3.4**	**2.84**	**0.29**	**2.2**	**1.04**	**0.08**	**2.71**	39.0	**8.4**	**0.21**
R1 Pond	0.194	**84.0**	70.1	**7.22**	**55.2**	**25.8**	**2.06**	67.0	963.9	207	5.15
R1 Stream	3.14	**5.2**	**4.33**	**0.45**	**3.4**	**1.59**	**0.13**	**4.14**	59.6	**8.4**	**0.32**
R3 Stream	4.39	**3.7**	**3.10**	**0.32**	**2.4**	**1.14**	**0.09**	**2.96**	42.6	11.1	**0.23**
R4 Stream	3.13	**5.2**	**4.35**	**0.45**	**3.4**	**1.60**	**0.13**	**4.15**	59.7	**8.4**	**0.32**
Trigger		100	9	10	100	100	10	10	10	10	1

*Also an endpoint from a sediment spiked test with *Hyalella azteca* is available. The endpoint is 7.5 mg/kg sediment. Hence, the RAC is 0.75 mg/kg sediment (=750 µg/kg sediment). Comparing this value with the highest FOCUS Step 3 PECsed value of 5.69 µg/kg sediment, the PEC/RAC = 0.0076. Hence, the risk is low for this use.

$FOCUS_{sw}$ step 1-3 - TERs for chlorothalonil – winter cereals at 750 g a.s./ha x 2

Scenario	**PEC global max (µg L)**	**Fish acute**	**Fish acute**	**Fish chronic**	**Amphibians acute**	**Aquatic invertebrates**	**Aquatic invertebrates prolonged**	**Algae**	**Higher plant**	**Sed. dweller prolonged***	**Microcosm / Mesocosm**
			SSD	*Pimephales*	*Spea*	*Crassostrea*	*Mysidopsis*	*Navicula*	*Lemna*	*Chironomus*	

				promelas	*multiplicata*	*virginica*	*bahia*	*pelliculosa*	*gibba*	*riparius*	
			HC_5	NOEC	LC50	EC_{50}	NOEC	EC_{50}	EC_{50}	NOEC	ETO-RAC
		16.3 µg/L	13.6 µg/L	1.4 µg/L	10.7 µg/L	5.0 µg/L	0.40 µg/L	13 µg/L	187 µg/L	40 µg/L	1.0 µg/L
FOCUS Step 1	197.8	**0.08**	**0.07**	**0.01**	**0.05**	**0.03**	**0.002**	**0.07**	**0.95**	**0.20**	**0.005**
FOCUS Step 2											
North Europe	9.8	**1.66**	**1.39**	**0.14**	**1.09**	**0.51**	**0.04**	**1.33**	19.1	**4.08**	**0.10**
South Europe	18.3	**0.89**	**0.74**	**0.08**	**0.58**	**0.27**	**0.02**	**0.71**	10.2	**2.19**	**0.05**
FOCUS Step 3											
D1 Ditch	4.19	**3.9**	**3.25**	**0.33**	**2.6**	**1.19**	**0.10**	**3.11**	44.6	**9.5**	**0.24**
D1 Stream	3.54	**4.6**	**3.84**	**0.40**	**3.0**	**1.41**	**0.11**	**3.67**	52.8	11.3	**0.28**
D2 Ditch	4.18	**3.9**	**3.25**	**0.33**	**2.6**	**1.20**	**0.10**	**3.11**	44.7	**9.6**	**0.24**
D2 Stream	3.42	**4.8**	**3.98**	**0.41**	**3.1**	**1.46**	**0.12**	**3.80**	54.7	11.7	**0.29**
D3 Ditch	4.15	**3.9**	**3.28**	**0.34**	**2.6**	**1.20**	**0.10**	**3.13**	45.1	**9.6**	**0.24**
D4 Pond	0.203	**80.3**	67.0	**6.90**	**52.7**	**24.6**	**1.79**	64.0	921	197.0	4.93
D4 Stream	3.13	**5.2**	**4.35**	**0.45**	**3.4**	**1.60**	**0.13**	**4.15**	59.7	12.8	**0.32**
D5 Pond	0.232	**70.3**	58.6	**6.03**	**46.1**	**21.6**	**1.72**	56.0	806	172.4	4.31
D5 Stream	3.62	**4.5**	**3.76**	**0.39**	**3.0**	**1.38**	**0.11**	**3.59**	51.7	11.0	**0.28**
D6 Ditch	4.32	**3.8**	**3.15**	**0.32**	**2.5**	**1.16**	**0.09**	**3.01**	43.3	**9.3**	**0.23**
R1 Pond	0.235	**69.4**	57.9	**5.96**	**45.5**	**21.3**	**1.70**	55.3	795	170.2	4.26
R1 Stream	2.82	**5.8**	**4.82**	**0.50**	**3.8**	**1.77**	**0.14**	**4.61**	66.3	14.2	**0.33**
R3 Stream	3.82	**4.3**	**3.56**	**0.37**	**2.8**	**1.31**	**0.10**	**3.40**	49.0	10.5	**0.26**
R4 Stream	2.71	**6.0**	**5.02**	**0.52**	**3.9**	**1.85**	**0.15**	**4.80**	69.0	14.8	**0.37**
Trigger		100	9	10	100	100	10	10	10	10	1

*Also an endpoint from a sediment spiked test with *Hyalella azteca* is available. The endpoint is 7.5 mg/kg sediment. Hence, the RAC is 0.75 mg/kg sediment (=750 µg/kg sediment). Comparing this value with the highest FOCUS Step 3 PECsed value of 7.05 µg/kg sediment, the PEC/RAC = 0.0094. Hence, the risk is low for this use.

$FOCUS_{sw}$ step 1-3 - TERs for chlorothalonil – tomatoes at 1000 g a.s./ha x 1

Scenario	PEC global max (µg L)	Fish acute	Fish acute	Fish chronic	Amphibians acute	Aquatic invertebrates	Aquatic invertebrates prolonged	Algae	Higher plant	Sed. dweller prolonged*	Microcosm / Mesocosm
			SSD	*Pimephales*	*Spea*	*Crassostrea*	*Mysidopsis*	*Navicula*	*Lemna*	*Chironomus*	

				promelas	*multiplicata*	*virginica*	*bahia*	*pelliculosa*	*gibba*	*riparius*	
			HC_5	NOEC	LC50	EC_{50}	NOEC	EC_{50}	EC_{50}	NOEC	ETO-RAC
		16.3 µg/L	13.6 µg/L	1.4 µg/L	10.7 µg/L	5.0 µg/L	0.40 µg/L	13 µg/L	187 µg/L	40 µg/L	1.0 µg/L
FOCUS Step 1	132	**0.12**	**0.10**	0.01	0.08	0.04	**0.003**	**0.09**	**1.42**	**0.29**	**0.01**
FOCUS Step 2											
North Europe	9.20	**1.77**	**1.48**	**0.15**	**1.16**	**0.54**	**0.04**	**1.41**	20.3	**4.35**	**0.11**
South Europe	9.20	**1.77**	**1.48**	**0.15**	**1.16**	**0.54**	**0.04**	**1.41**	20.3	**4.35**	**0.11**
FOCUS Step 3											
D6 Ditch	6.29	**2.59**	**2.16**	**0.22**	**1.70**	**0.79**	**0.06**	**2.07**	29.8	**6.4**	**0.16**
R2 Stream	5.61	**2.91**	**2.42**	**0.25**	**1.91**	**0.89**	**0.07**	**2.32**	33.3	**7.1**	**0.18**
R3 Stream	5.90	**2.76**	**2.31**	**0.24**	**1.81**	**0.85**	**0.07**	**2.20**	31.7	**6.8**	**0.17**
R4 Stream	5.42	**3.01**	**2.51**	**0.26**	**1.97**	**0.92**	**0.07**	**2.40**	34.5	**7.4**	**0.18**
Trigger		100	9	10	100	100	10	10	10	10	1

*Also an endpoint from a sediment spiked test with *Hyalella azteca* is available. The endpoint is 7.5 mg/kg sediment. Hence, the RAC is 0.75 mg/kg sediment (=750 µg/kg sediment). Comparing this value with the highest FOCUS Step 3 PECsed value of 4.52 µg/kg sediment, the PEC/RAC = 0.0060. Hence, the risk is low for this use.

$FOCUS_{sw}$ step 1-3 - TERs for chlorothalonil – Potatoes at 750 g a.s./ha x 1

Scenario	PEC global max (µg L)	Fish acute	Fish acute	Fish chronic	Amphibians acute	Aquatic invertebrates	Aquatic invertebrates prolonged	Algae	Higher plant	Sed. dweller prolonged*	Microcosm / Mesocosm
			SSD	*Pimephales promelas*	*Spea multiplicata*	*Crassostrea virginica*	*Mysidopsis bahia*	*Navicula pelliculosa*	*Lemna gibba*	*Chironomus riparius*	
			HC_5	NOEC	LC50	EC_{50}	NOEC	EC_{50}	EC_{50}	NOEC	ETO-RAC
		16.3 µg/L	13.6 µg/L	1.4 µg/L	10.7 µg/L	5.0 µg/L	0.40 µg/L	13 µg/L	187 µg/L	40 µg/L	1.0 µg/L
FOCUS Step 1	98.9	0.16	**0.13**	**0.01**	**0.10**	**0.05**	**0.004**	**0.13**	**1.89**	**0.39**	**0.01**
FOCUS Step 2											
North Europe	6.90	**2.36**	**1.97**	**0.20**	**1.55**	**0.72**	**0.06**	**1.88**	27.1	**5.80**	**0.14**
South Europe	7.06	**2.30**	**1.92**	**0.20**	**1.51**	**0.71**	**0.06**	**1.80**	26.5	**5.66**	**0.14**
FOCUS Step 3											
D3 Ditch	3.93	**4.15**	**3.46**	**0.36**	**2.7**	**1.27**	**0.10**	**3.31**	47.6	10.2	**0.25**
D4 Pond	0.16	**101.88**	85.0	**8.75**	**66.9**	**31.3**	**2.50**	81.25	1176	250.0	6.25
D4 Stream	3.24	**5.03**	**4.20**	**0.43**	**3.3**	**1.54**	**0.12**	**4.01**	57.7	12.3	**0.31**

D6- 1st Ditch	3.88	**4.20**	**3.51**	**0.36**	**2.8**	**1.29**	**0.10**	**3.35**	48.1	10.3	**0.26**
D6- 2nd Ditch	3.95	**4.13**	**3.44**	**0.35**	**2.7**	**1.27**	**0.10**	**3.29**	47.4	10.1	**0.25**
R1 Pond	0.47	**33.27**	27.8	**2.86**	**21.8**	**10.2**	**0.82**	26.53	398.7	81.6	2.04
R1 Stream	2.85	**5.72**	**4.77**	**0.49**	**3.7**	**1.75**	**0.14**	**4.56**	65.7	14.0	**0.35**
R2 Stream	3.6	**4.53**	**3.78**	**0.39**	**3.0**	**1.39**	**0.11**	**3.61**	52.0	11.1	**0.28**
R3 Stream	3.83	**4.26**	**3.55**	**0.37**	**2.8**	**1.31**	**0.10**	**3.39**	48.9	10.4	**0.26**
Trigger		100	9	10	100	100	10	10	10	10	1

*Also an endpoint from a sediment spiked test with *Hyalella azteca* is available. The endpoint is 7.5 mg/kg sediment. Hence, the RAC is 0.75 mg/kg sediment (=750 µg/kg sediment). Comparing this value with the highest FOCUS Step 3 PECsed value of 8.51 µg/kg sediment, the PEC/RAC = 0.011. Hence, the risk is low for this use.

FOCUS Step 4; Acute risk to fish: RAC = 1.5 µg a.s./L (HC5 of 13.6 µg a.s./L with a SF of 9)

Comparison of exposure scenarios following application of chlorothalonil to spring cereals at FOCUS Step 4 to RACfish of 1.5 µg a.s./L

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC_{SW} [µg/L]		
Run-off mitigation			**-**	**60% (10 m RO buffer)**	**80% (20 m RO buffer)**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
Spring cereals 1 x 750 g a.s./ha BBCH 30	D1	Ditch	0.690	-	-
	D1	Stream	0.814	-	-
	D3	Ditch	0.684	-	-
	D4	Pond	-	-	-
	D4	Stream	0.793	-	-
	D5	Pond	-	-	-
	D5	Stream	0.857	-	-

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC$_{SW}$ [µg/L]		
Run-off mitigation			-	**60% (10 m RO buffer)**	**80% (20 m RO buffer)**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
	R4	Stream	0.608	-	-
Spring cereals 2 x 750 g a.s./ha BBCH 30	D1	Ditch	0.786	-	-
	D1	Stream	0.667	-	-
	D3	Ditch	0.561	-	-
	D4	Pond	-	-	-
	D4	Stream	0.651	-	-
	D5	Pond	-	-	-
	D5	Stream	0.702	-	-
	R4	Stream	**5.07**	**2.28**	1.19

PEC values in bold are greater than the RAC of 1.5 µg/L

Comparison of exposure scenarios following application of chlorothalonil to winter cereals at FOCUS Step 4 to RACfish of 1.5 µg a.s./L

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC$_{SW}$ [µg/L]		
Run-off mitigation			-	**60% (10 m RO buffer)**	**80% (20 m RO buffer)**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
Winter cereals 1 x 750 g a.s./ha BBCH 30	D1	Ditch	0.684	-	-
	D1	Stream	0.717	-	-
	D2	Ditch	0.687	-	-
	D2	Stream	0.766	-	-
	D3	Ditch	0.681	-	-

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC_{SW} [µg/L]		
	D4	Pond	-	-	-
	D4	Stream	0.679	-	-
	D5	Pond	-	-	-
	D5	Stream	0.734	-	-
	D6	Ditch	0.688	-	-
	R1	Pond	-	-	-
	R1	Stream	**2.82**	1.28	-
	R3	Stream	0.851	-	-
	R4	Stream	0.606	-	-
Winter cereals 2 x 750 g a.s./ha BBCH 30	D1	Ditch	0.565	-	-
	D1	Stream	0.649	-	-
	D2	Ditch	0.563	-	-
	D2	Stream	0.627	-	-
	D3	Ditch	0.559	-	-
	D4	Pond	-	-	-
	D4	Stream	0.575	-	-
	D5	Pond	-	-	-
	D5	Stream	0.664	-	-
	D6	Ditch	0.582	-	-
	R1	Pond	-	-	-
	R1	Stream	**2.82**	1.28	-
	R3	Stream	**3.36**	**1.53**	0.804
	R4	Stream	**1.63**	0.736	-

PEC values in bold are greater than the RAC of 1.5 µg/L

Comparison of exposure scenarios following application of chlorothalonil to tomatoes at FOCUS Step 4 to RACfish of 1.5 µg a.s./L

Crop (Use pattern)	**Scenario**	**Water body**	**FOCUS Step 4 PEC_{SW} [µg/L]**		
Run-off mitigation			**-**	**60% (10 m RO buffer)**	**80% (20 m RO buffer)**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
Tomatoes 1 x 1000 g a.s./ha BBCH 51	D6	Ditch	0.904	-	-
	R2	Stream	**1.09**	1.09	-
	R3	Stream	**1.17**	1.14	-
	R4	Stream	**5.42**	**2.46**	1.29

PEC values in bold are greater than the RAC of 1.5 µg/L

Comparison of exposure scenarios following application of chlorothalonil to potatoes at FOCUS Step 4 to RACfish of 1.5 µg a.s./L

Crop (Use pattern)	**Scenario**	**Water body**	**FOCUS Step 4 PEC_{SW} [µg/L]**		
Run-off mitigation			**-**	**60% (10 m RO buffer)**	**80% (20 m RO buffer)**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
Potatoes, 1 x 750 g a.s./ha, BBCH 40	D3	Ditch		0.683	-
	D4	Pond		-	-
	D4	Stream		0.724	-
	D6	1st Ditch		0.675	-
	D6	2nd Ditch		0.686	-
	R1	Pond		-	-
	R1	Stream		1.296	-
	R2	Stream		0.803	-
	R3	Stream		1.348	-

PEC values in bold are greater than the RAC of 1.5 µg/L

FOCUS Step 4: Chronic risk to fish, based on 1st Tier RAC of 0.14 µg a.s./L

Comparison of exposure scenarios following application of chlorothalonil to spring cereals at FOCUS Step 4 to chronic RACfish of 0.14 µg a.s./L

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC_{SW} [µg/L]		
Run-off mitigation			**-**	**60%**	**80%**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
Spring cereals 1 x 750 g a.s./ha BBCH 30	D1	Ditch	**0.690**	**0.690**	**0.359**
	D1	Stream	**0.814**	**0.814**	**0.423**
	D3	Ditch	**0.684**	**0.684**	**0.355**
	D4	Pond	0.102	0.102	0.068
	D4	Stream	**0.793**	**0.793**	**0.412**
	D5	Pond	0.102	0.102	0.068
	D5	Stream	**0.857**	**0.857**	**0.445**
	R4	Stream	**0.608**	**0.608**	**0.316**
Spring cereals 2 x 750 g a.s./ha BBCH 30	D1	Ditch	**0.786**	**0.786**	**0.397**
	D1	Stream	**0.667**	**0.667**	**0.339**
	D3	Ditch	**0.561**	**0.561**	**0.285**
	D4	Pond	0.139	0.139	0.091
	D4	Stream	**0.651**	**0.651**	**0.331**
	D5	Pond	**0.141**	**0.141**	0.092
	D5	Stream	**0.702**	**0.702**	**0.357**
	R4	Stream	**5.070**	**2.277**	**1.188**

PEC values in bold are greater than the RAC of 0.14 µg/L

Comparison of exposure scenarios following application of chlorothalonil to winter cereals at FOCUS Step 4 to chronic RACfish of 0.14 µg a.s./L

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC$_{SW}$ [µg/L]		
Run-off mitigation			**-**	**60%**	**80%**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
Winter cereals 1 x 750 g a.s./ha BBCH 30	D1	Ditch	**0.684**	**0.684**	**0.356**
	D1	Stream	**0.717**	**0.717**	**0.373**
	D2	Ditch	**0.687**	**0.687**	**0.357**
	D2	Stream	**0.766**	**0.766**	**0.398**
	D3	Ditch	**0.681**	**0.681**	**0.354**
	D4	Pond	0.102	0.102	0.068
	D4	Stream	**0.679**	**0.679**	**0.353**
	D5	Pond	0.102	0.102	0.068
	D5	Stream	**0.734**	**0.734**	**0.381**
	D6	Ditch	**0.688**	**0.688**	**0.358**
	R1	Pond	**0.144**	0.107	0.068
	R1	Stream	**2.819**	**1.275**	**0.667**
	R3	Stream	**0.851**	**0.851**	**0.442**
	R4	Stream	**0.606**	**0.606**	**0.315**
Winter cereals 2 x 750 g a.s./ha BBCH 30	D1	Ditch	**0.565**	**0.565**	**0.287**
	D1	Stream	**0.649**	**0.649**	**0.330**
	D2	Ditch	**0.563**	**0.563**	**0.286**
	D2	Stream	**0.627**	**0.627**	**0.319**
	D3	Ditch	**0.559**	**0.559**	**0.284**
	D4	Pond	0.124	0.112	0.081
	D4	Stream	**0.575**	**0.575**	**0.292**
	D5	Pond	**0.141**	0.127	0.093
	D5	Stream	**0.664**	**0.664**	**0.338**
	D6	Ditch	**0.582**	**0.569**	**0.295**

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC_{SW} [µg/L]		
	R1	Pond	**0.157**	0.123	0.086
	R1	Stream	**2.819**	**1.275**	**0.667**
	R3	Stream	**3.355**	**1.531**	**0.804**
	R4	Stream	**1.631**	**0.736**	**0.384**

PEC values in bold are greater than the RAC of 0.14 µg/L

Comparison of exposure scenarios following application of chlorothalonil to tomatoes at FOCUS Step 4 to chronic RACfish of 0.14 µg a.s./L

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC_{SW} [µg/L]		
Run-off mitigation			**-**	**60%**	**80%**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
Tomatoes 1 x 1000 g a.s./ha BBCH 51	D6	Ditch	**0.904**	**0.904**	**0.470**
	R2	Stream	**1.087**	**1.087**	**0.565**
	R3	Stream	**1.169**	**1.143**	**0.594**
	R4	Stream	**5.419**	**2.465**	**1.292**

PEC values in bold are greater than the RAC of 0.14 µg/L

Comparison of exposure scenarios following application of chlorothalonil to potatoes at FOCUS Step 4 to chronic RACfish of 0.14 µg a.s./L

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC_{SW} [µg/L]		
Run-off mitigation			**-**	**60%**	**80%**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
Potatoes, 1 x 750 g a.s./ha					

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC$_{SW}$ [µg/L]		
Run-off mitigation			**-**	**60%**	**80%**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
	D3	Ditch		**0.683**	**0.355**
	D4	Pond		**0.102**	0.068
	D4	Stream		**0.724**	**0.376**
	D6	1st Ditch		**0.675**	**0.351**
	D6	2nd Ditch		**0.686**	**0.357**
	R1	Pond		**0.221**	**0.125**
	R1	Stream		**1.296**	**0.679**
	R2	Stream		**0.803**	**0.417**
	R3	Stream		**1.348**	**0.705**

PEC values in bold are greater than the RAC of 0.14 µg/L

FOCUS Step 4: Acute risk to amphibians, based on 1st Tier RAC of 0.107 µg a.s./L

Comparison of exposure scenarios following application of chlorothalonil to spring cereals at FOCUS Step 4 to RACamphib of 0.107 µg a.s./L

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC$_{SW}$ [µg/L]		
Run-off mitigation			**-**	**60%**	**80%**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
Spring cereals 1 x 750 g a.s./ha BBCH 30	D1	Ditch	**0.690**	**0.690**	**0.359**
	D1	Stream	**0.814**	**0.814**	**0.423**
	D3	Ditch	**0.684**	**0.684**	**0.355**
	D4	Pond	0.102	0.102	0.068
	D4	Stream	**0.793**	**0.793**	**0.412**
	D5	Pond	0.102	0.102	0.068
	D5	Stream	**0.857**	**0.857**	**0.445**

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC$_{SW}$ [µg/L]		
Run-off mitigation			**-**	**60%**	**80%**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
	R4	Stream	**0.608**	**0.608**	**0.316**
Spring cereals 2 x 750 g a.s./ha BBCH 30	D1	Ditch	**0.786**	**0.786**	**0.397**
	D1	Stream	**0.667**	**0.667**	**0.339**
	D3	Ditch	**0.561**	**0.561**	**0.285**
	D4	Pond	**0.139**	**0.139**	0.091
	D4	Stream	**0.651**	**0.651**	**0.331**
	D5	Pond	**0.141**	**0.141**	0.092
	D5	Stream	**0.702**	**0.702**	**0.357**
	R4	Stream	**5.070**	**2.277**	**1.188**

PEC values in bold are greater than the RAC of 0.107 µg/L

Comparison of exposure scenarios following application of chlorothalonil to winter cereals at FOCUS Step 4 to RACamphib of 0.107 µg a.s./L

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC$_{SW}$ [µg/L]		
Run-off mitigation			**-**	**60%**	**80%**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
Winter cereals 1 x 750 g a.s./ha BBCH 30	D1	Ditch	**0.684**	**0.684**	**0.356**
	D1	Stream	**0.717**	**0.717**	**0.373**
	D2	Ditch	**0.687**	**0.687**	**0.357**
	D2	Stream	**0.766**	**0.766**	**0.398**
	D3	Ditch	**0.681**	**0.681**	**0.354**
	D4	Pond	0.102	0.102	0.068
	D4	Stream	**0.679**	**0.679**	**0.353**

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC$_{SW}$ [µg/L]		
	D5	Pond	0.102	0.102	0.068
	D5	Stream	**0.734**	**0.734**	**0.381**
	D6	Ditch	**0.688**	**0.688**	**0.358**
	R1	Pond	**0.144**	**0.107**	0.068
	R1	Stream	**2.819**	**1.275**	**0.667**
	R3	Stream	**0.851**	**0.851**	**0.442**
	R4	Stream	**0.606**	**0.606**	**0.315**
Winter cereals 2 x 750 g a.s./ha BBCH 30	D1	Ditch	**0.565**	**0.565**	**0.287**
	D1	Stream	**0.649**	**0.649**	**0.330**
	D2	Ditch	**0.563**	**0.563**	**0.286**
	D2	Stream	**0.627**	**0.627**	**0.319**
	D3	Ditch	**0.559**	**0.559**	**0.284**
	D4	Pond	**0.124**	**0.112**	0.081
	D4	Stream	**0.575**	**0.575**	**0.292**
	D5	Pond	**0.141**	**0.127**	0.093
	D5	Stream	**0.664**	**0.664**	**0.338**
	D6	Ditch	**0.582**	**0.569**	**0.295**
	R1	Pond	**0.157**	**0.123**	0.086
	R1	Stream	**2.819**	**1.275**	**0.667**
	R3	Stream	**3.355**	**1.531**	**0.804**
	R4	Stream	**1.631**	**0.736**	**0.384**

PEC values in bold are greater than the RAC of 0.107 µg/L

Comparison of exposure scenarios following application of chlorothalonil to tomatoes at FOCUS Step 4 to RACamphib of 0.107 µg a.s./L

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC$_{SW}$ [µg/L]		
Run-off mitigation			**-**	**60%**	**80%**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
Tomatoes 1 x 1000 g a.s./ha BBCH 51	D6	Ditch	**0.904**	**0.904**	**0.470**
	R2	Stream	**1.087**	**1.087**	**0.565**
	R3	Stream	**1.169**	**1.143**	**0.594**
	R4	Stream	**5.419**	**2.465**	**1.292**

PEC values in bold are greater than the RAC of 0.107 µg/L

Comparison of exposure scenarios following application of chlorothalonil to potatoes at FOCUS Step 4 to RACamphib of 0.107 µg a.s./L

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC$_{SW}$ [µg/L]		
Run-off mitigation			**-**	**60%**	**80%**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
Potatoes, 1 x 750 g a.s./ha					
	D3	Ditch		**0.683**	**0.355**
	D4	Pond		**0.102**	0.068
	D4	Stream		**0.724**	**0.376**
	D6	1st Ditch		**0.675**	**0.351**
	D6	2nd Ditch		**0.686**	**0.357**
	R1	Pond		**0.221**	**0.125**
	R1	Stream		**1.296**	**0.679**
	R2	Stream		**0.803**	**0.417**
	R3	Stream		**1.348**	**0.705**

PEC values in bold are greater than the RAC of 0.107 µg/L

FOCUS Step 4: Risk to aquatic invertebrates and primary producers, based on ETO-RAC of 1.0 µg a.s./L

Comparison of exposure scenarios following application of chlorothalonil to spring cereals at FOCUS Step 4 to the ETO-RAC of 1.0 µg a.s./L

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC_{SW} [µg/L]		
Run-off mitigation			-	60% (10 m RO buffer)	80% (20 m RO buffer)
Spray-drift buffer			10 m	10 m	20 m
Spring cereals 1 x 750 g a.s./ha BBCH 30	D1	Ditch	0.722	-	-
	D1	Stream	0.815	-	-
	D3	Ditch	0.684	-	-
	D4	Pond	-	-	-
	D4	Stream	0.802	-	-
	D5	Pond	-	-	-
	D5	Stream	0.857	-	-
	R4	Stream	0.608	-	-
Spring cereals 2 x 750 g a.s./ha BBCH 30	D1	Ditch	0.754	-	-
	D1	Stream	0.668	-	-
	D3	Ditch	0.564	-	-
	D4	Pond	-	-	-
	D4	Stream	0.660	-	-
	D5	Pond	-	-	-
	D5	Stream	0.706	-	-
	R4	Stream	**5.43**	**2.44**	**1.27**

PEC values in bold are greater than the ETO-RAC of 1.0 µg/L

Comparison of exposure scenarios following application of chlorothalonil to winter cereals at FOCUS Step 4 to the ETO-RAC of 1.0 µg a.s./L

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC$_{SW}$ [µg/L]		
Run-off mitigation			**-**	**60% (10 m RO buffer)**	**80% (20 m RO buffer)**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
Winter cereals 1 x 750 g a.s./ha BBCH 30	D1	Ditch	0.683	-	-
	D1	Stream	0.709	-	-
	D2	Ditch	0.688	-	-
	D2	Stream	0.747	-	-
	D3	Ditch	0.682	-	-
	D4	Pond	-	-	-
	D4	Stream	0.702	-	-
	D5	Pond	-	-	-
	D5	Stream	0.751	-	-
	D6	Ditch	0.715	-	-
	R1	Pond	-	-	-
	R1	Stream	**2.990**	**1.35**	0.707
	R3	Stream	0.851	-	-
	R4	Stream	0.606	-	-
Winter cereals 2 x 750 g a.s./ha BBCH 30	D1	Ditch	0.605	-	-
	D1	Stream	0.660	-	-
	D2	Ditch	0.571	-	-
	D2	Stream	0.615	-	-
	D3	Ditch	0.559	-	-
	D4	Pond	-	-	-

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC_{SW} [µg/L]		
	D4	Stream	0.613	-	-
	D5	Pond	-	-	-
	D5	Stream	0.679	-	-
	D6	Ditch	0.610	-	-
	R1	Pond	-	-	-
	R1	Stream	**2.99**	**1.35**	0.707
	R3	Stream	**3.53**	**1.61**	0.846
	R4	Stream	**1.71**	0.774	-

PEC values in bold are greater than the ETO-RAC of 1.0 µg/L

Comparison of exposure scenarios following application of chlorothalonil to tomatoes at FOCUS Step 4 to the ETO-RAC of 1.0 µg a.s./L

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC_{SW} [µg/L]		
Run-off mitigation			**-**	**60% (10 m RO buffer)**	**80% (20 m RO buffer)**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
Tomatoes 1 x 1000 g a.s./ha BBCH 51	D6	Ditch	0.904	-	-
	R2	Stream	**1.09**	**1.09**	0.565
	R3	Stream	**1.169**	**1.14**	0.594
	R4	Stream	**5.419**	**2.465**	**1.292**

PEC values in bold are greater than the ETO-RAC of 1.0 µg/L

Comparison of exposure scenarios following application of chlorothalonil to potatoes at FOCUS Step 4 to the ETO-RAC of 1.0 µg a.s./L.

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC$_{SW}$ [µg/L]		
Run-off mitigation			**-**	**60% (10 m RO buffer)**	**80% (20 m RO buffer)**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
Potatoes, 1 x 750 g a.s./ha					
	D3	Ditch		0.682	-
	D4	Pond		-	-
	D4	Stream		0.739	-
	D6	1st Ditch		0.675	-
	D6	2nd Ditch		0.702	-
	R1	Pond		-	-
	R1	Stream		**1.407**	0.738
	R2	Stream		0.803	-
	R3	Stream		**1.503**	0.787

PEC values in bold are greater than the ETO-RAC of 1.0 µg/L

Comparison of exposure scenarios following application of chlorothalonil to tomatoes at FOCUS Step 4 to the ERO-RAC of 3.1 µg a.s./L

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC$_{SW}$ [µg/L]		
Run-off mitigation			**-**	**60% (10 m RO buffer)**	**80% (20 m RO buffer)**
Spray-drift buffer			**10 m**	**10 m**	**20 m**
Tomatoes 1 x 1000 g a.s./ha BBCH 51	D6	Ditch	0.909	-	-
	R2	Stream	1.09	-	-
	R3	Stream	1.21	-	-
	R4	Stream	**5.58**	2.54	1.33

PEC values in bold are greater than the ERO-RAC of 3.1 µg/L

Comparison of exposure scenarios following application of chlorothalonil to potatoes at FOCUS Step 4 to the ERO-RAC of 3.1 µg a.s./L.

Crop (Use pattern)	Scenario	Water body	FOCUS Step 4 PEC_{SW} [µg/L]		
Run-off mitigation			-	60% (10 m RO buffer)	80% (20 m RO buffer)
Spray-drift buffer			10 m	10 m	20 m
Potatoes, 1 x 750 g a.s./ha					
	D3	Ditch		0.682	-
	D4	Pond		-	-
	D4	Stream		0.739	-
	D6	1st Ditch		0.675	-
	D6	2nd Ditch		0.702	-
	R1	Pond		-	-
	R1	Stream		1.407	-
	R2	Stream		0.803	-
	R3	Stream		1.503	-

PEC values in bold are greater than the ERO-RAC of 3.1 µg/L

Risk to aquatic organisms from chlorothalonil metabolites*

Test species	Metabolite	End-point	Value (mg/L)	RAC (µg/L)	Max FOCUS Step 2 PEC (µg/L) #
Fish					
Oncorhynchus	R417888	96-h acute	> 100	>1000	29.13

Test species	Metabolite	End-point	Value (mg/L)	RAC (µg/L)	Max FOCUS Step 2 PEC (µg/L) #
mykiss	R182281 (SDS-3701)	LC_{50}	9.1	91	46.58
	R611965 (SDS-46851)		> 120	>1200	20.48
	R613841 (SDS-67042)		> 0.83	>8.3	**21.64**
	R613842 (SDS-67042 sulphoxide)		> 0.99	>9.9	8.91
	R613636 (SDS-19221)		18	180	33.9
	R613801			0.0163**	**9.66**
Aquatic invertebrates					
Daphnia magna	R417888	48-h acute EC_{50}	> 110	>1100	29.13
Mysidopsis bahia	R182281 (SDS-3701)		19	190	46.58
Daphnia magna	R611965 (SDS-46851)		> 100	>1000	20.48
	R613841 (SDS-67042)		> 0.94	>9.4	**21.64**
	R613842 (SDS-67042 sulphoxide)		>0.89	>8.9	8.91
	R613636 (SDS-19221)		12.4	124	33.9
	R613801		0.56	5.6	**9.66**
Algae					
Pseudokirchneriella subcapitataa	R182281 (SDS-3701)	72-h E_rC_{50}**	13000	0.13	46.58
	R417888	72 h E_rC_{50}	>100	>10000	29.13
	R611965 (SDS-46851)		55	5500	20.48
Pseudokirchneriella subcapitataa	R613841 (SDS-67042)		>0.041	4.1	**21.64**
Pseudokirchneriella subcapitataa	R613842 sulfoxide (SDS-67042)		>0.88	>88	8.91
	R613636 (SDS-19221)		12	1200	33.9
	R613801		0.38	38	9.66

* All metabolites defined in the LoEP as needing an assessment are covered, including the 5 groundwater metabolites from the lysimeter study

** In the absence of toxicity data this metabolite was considered 10 times more toxic than the parent

#Values in bold indicate a high risk

Risk envelope for the surface water metabolites without toxicity endpoints

		Fish acute	Amphibians acute	Aquatic invertebrates	Algae	Higher plant
		Galaxias maculatus	*Spea multiplicata*	*Crassostrea virginica*	*Navicula pelliculosa*	*Lemna gibba*
		LC50	LC50	EC_{50}	EC_{50}	EC_{50}
		1.63 µg/L**	1.07 µg/L**	0.5µg/L**	1.3 µg/L**	18.7 µg/L**
		RAC	RAC	RAC	RAC	RAC
		0.0163 µg/L	0.0107 µg/L	0.005 µg/L	0.13 µg/L	1.87 µg/L
STEP 1 PEC MAX CEREALS*	166.5 µg/L	**High risk**	**High risk**	**High risk**	**High risk**	**High risk**
STEP 1 PEC MAX TOMATOES*	111 µg/L	**High risk**	**High risk**	**High risk**	**High risk**	**High risk**
STEP 1 PEC MAX POTATOES*	83.248 µg/L	**High risk**	**High risk**	**High risk**	**High risk**	**High risk**

** In the absence of toxicity data this metabolite was considered 10 times more toxic than the parent

	Step 2 worst case PEC (ug/L)*		
	Cereals	Tomatoes	Potatoes
R418503 (M13, compound 11)	**10.33**	**2.24**	**2.245**
R419492 (M8, compound 12)	**27.44**	**5.21**	**5.21**
R471811 (M4, compound 13)	**26.12**	**4.94**	**6.172**
SYN507900 (SDS66882)	**8.7**	**1.68**	**1.676**
SYN546671(C6)	**10.5**	**4.49**	**4.08**
SYN546934 (MM196)	**4.07**	**1.73**	**1.574**
R611966 (compound 5, SDS47523)	**10.68**	**2.66**	**2.568**
R611967 (compound 6, SDS47524)	**11.51**	**2.55**	**2.548**
R613801 (MM230, C-1, PD2)	**9.66**	**4.18**	**3.835**
PD1 (R613911)	**5.28**	**2.25**	**1.688**
PD4	**10.01**	**4.27**	**3.873**
PD5 (SYN549430)	**18.92**	**8.07**	**7.323**
U38	**4.04**	**1.72**	**1.565**
U40	**15.03**	**6.41**	**5.817**
U44	**3.24**	**1.38**	**1.255**

*Values in bold indicate a high risk

Risk envelope for the surface water metabolites without toxicity endpoints

RAC= 750 µg as/kg sed (chronic toxicity, *Hyalella azteca*, metabolites considered as 10 times more toxic than the parent)

	Step 2 worst case PEC (ug/L)*		
	Cereals	Tomatoes	Potatoes
R182281	181.8	50.35	48.154
SYN546671	<0.01	<0.01	<0.01
R611966	44.89	11.12	10.742
R613801	<0.01	<0.01	<0.01
R613841	<0.01	<0.01	<0.01
R613842	<0.01	<0.01	<0.01
U38	<0.01	<0.01	<0.01
U40	<0.01	<0.01	<0.01
U44	<0.01	<0.01	<0.01

*Values in bold indicate a high risk

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	a.s., chlorothalonil	Acute	Oral toxicity (LD_{50})	> 63.3 µg/bee
Apis mellifera	a.s., chlorothalonil	Acute	Oral toxicity (LD_{50})	> 40 µg/bee
Bombus terrestris	a.s., chlorothalonil	Acute	Oral toxicity (LD_{50})	> 94 µg/bee
Apis mellifera	A14111B	Acute	Oral toxicity (LD_{50})	> 917 µg formulation/bee > 317 µg a.s./bee
Apis mellifera	a.s., chlorothalonil	Acute	Contact toxicity (LD_{50})	> 101 µg/bee
Apis mellifera	a.s., chlorothalonil	Acute	Contact toxicity (LD_{50})	> 40 µg/bee
Bombus terrestris	a.s., chlorothalonil	Acute	Contact toxicity (LD_{50})	>100 µg/bee
Apis mellifera	A14111B	Acute	Contact toxicity (LD_{50})	> 1531 µg formulation/bee > 523 µg a.s./bee
Apis mellifera	a.s., chlorothalonil	Chronic	10 d-LD_{50}	53.9 µg/bee/day
Apis mellifera	A14111B	Chronic	10 d-LD_{50}	171 µg formulation/bee/day
Apis mellifera	A7867A Chlorothalonil SC**	8d*	NOEDlarvae LD_{10}	3.6 µg/larva/day 14.5 µg/larva/developmental period 2.5 µg/larva/day 10.0 µg/larva/developmental period
Apis mellifera	A14111B	8d	NOEDlarvae	7.8 µg formulation/larva/day 31.3 µg formulation/larva/developmental period

* 4 days dosing

**This study was performed with a formulation different from the representative one containing 498 g/L of chlorothalonil corresponding to 39.9 % w/w

Risk assessment for – tomatoes at 1000 g a.s./ha [1 x] as the worst-case requested use

Screening step

Test substance	Crop Group	Species	Type	App. rate (g a.s./ha)	Toxicity value (µg/bee)	$HQ_{contact}$/ETR	Trigger
Chlorothalonil	Tomatoes	Honeybee	Contact	1000	>101	<9.9	42
		Bumble bee	Contact	1000	> 100	**<10.0**	7
		Honeybee	Oral	1000	7.6	<0.12	0.2
		Bumble bee	Oral	1000	11.2	**<0.12**	0.036
		Honeybee	Chronic	1000	53.9	**0.141**	0.03
		Honeybee	Larval	1000	10*	**1.76****	0.2

* LD_{10}

**A data gap was identified for a toxicity study on honeybee larvae (preferably with a repeated exposure regime) performed with the active substance

HQ/ETRs in **bold** are above the relevant trigger and require further refinementHQ/ETRs in **bold** are above the relevant trigger and require further refinement

Tier 1 Acute contact and oral toxicity - bumble bee

scenario	BBCH	Bumble bee	
		HQ	trigger
Tomato (1kg/ha, BBCH 51-89)			
Contact			
treated crop	≥ 50	0.0	7
weeds	≥ 50	3.0	7
field margin	≥ 50	0.3	7
treated crop	≥ 50	0.0	2.3
weeds	≥ 50	0.3	2.3
field margin	≥ 50	1.0	2.3
Oral			
treated crop	50 - 69	0.02	0.036
treated crop	≥ 70	0.00	0.036
weeds	50 - 69	0.02	0.036
weeds	≥ 70	0.02	0.036
field margin	50 - 69	0.00	0.036
field margin	≥ 70	0.00	0.036
adjacent crop	50 - 69	0.00	0.036
adjacent crop	≥ 70	0.00	0.036
next crop	50 - 69	0.01	0.036
next crop	≥ 70	0.01	0.036

Tier 1 Chronic adult and larval toxicity - honey bee

Test substance	Crop Group	Scenario	App. rate (kg a.s./ha)	Shortcut Value (downward spray)	LDD_{50} oral (µg ./bee/day)	Ef	TWA	$ETR_{chronic}$ adult oral or ETR_{larval}	Trigger
Chronic adult									

Chlorothalonil	Tomato	Treated crop	1.0	0.92	53.9	1	0.72	0.01	0.03
		Weeds		2.9		0.3		0.01	
		Field margin		2.9		0.0092		0.00	
		Adjacent crop		5.8		0.0033		0.00	
		Next crop		0.54		1		0.01	
Larval*									
Chlorthalonil	Tomato	Treated crop	1.0	0.15	10.0*	1	0.85	0.01	0.2
		Weeds		2.2		0.3		0.06	
		Field margin		2.2		0.0092		0.00	
		Adjacent crop		4.4		0.0033		0.00	
		Next crop		0.4		1		0.03	

*A data gap was identified for a toxicity study on honeybee larvae (preferably with a repeated exposure regime) performed with the active substance

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	BRAVO 720 SC*, (52.7% w/w), Petri dish	Mortality Reproduction	0, 0 and 5% at resp. 1.5, 6 and 7.7 kg as/ha 78, 94 and 94% effect at resp. 1.5, 6 and 7.7 kg as/ha
Aphidius rhopalosiphi	BRAVO 720 SC* (52.7% w/w) Petri dish	Mortality Reproduction	5, 55, 41, 62 and 55% at resp. 0.044, 0.173, 1.1, 4.3 and 7.7 kg as/ha No effect at the lowest dose of 0.044 kg as/ha
Typhlodromus pyri	Chlorothalonil 500 g/L SC (Oxon), Glass plates	Mortality Reproduction	23% at 1.5 kg as/ha (3.5 L formulation/ha) 11% effect at 1.5 kg as/ha
Aphidius rhopalosiphi	Chlorothalonil 500 g/L SC (Oxon), Glass plates	Mortality Reproduction	0% at 1.5 kg as/ha (3.5 L formulation/ha) 9% effect at 1.5 kg as/ha

Species	Test Substance	End point	Toxicity
Typhlodromus pyri	Chlorothalonil 75 WG*, Glass plates	Mortality Reproduction	5% at 1.5 kg as/ha (1.98 kg product/ha) 9% effect at 1.5 kg as/ha
Aphidius rhopalosiphi	Chlorothalonil 75 WG*, Glass plates	Mortality Reproduction	6.7% at 1.5 kg as/ha (1.98 kg product/ha) 31% effect at 1.5 kg as/ha
Typhlodromus pyri	A14111B[1], glass plates	Mortality, LR50 Reproduction, ER50	>2095 g chlorothalonil/ha (>5000 mL A14111B/ha) <524 g chlorothalonil/ha (<1250 mL A14111B/ha)
Aphidius rhopalosiphi	A14111B[1], glass plates	Mortality, LR50 Reproduction, ER50	>262 g chlorothalonil/ha (>625 mL A14111B/ha) >1048 g chlorothalonil/ha (>2500 mL A14111B/ha)
Additional species			
Chrysoperla carnea	BRAVO 720 SC*, (52.7% w/w), Glass plates	Mortality Reproduction	8,8 and 5% at resp. 0.31, 6 and 7.67 kg as/ha 2.7, 5.4 and -2% effect at resp. 0.31, 6 and 7.67 kg as/ha
Poecilus cupreus	BRAVO 720 SC*, (52.7% w/w), Boxes with damp sand	Mortality Feeding activity	0% at 10.5 kg as/ha No effects at 10.5 kg as/ha
Aleochara bilineata	Chlorothalonil 500 g/L SC (Oxon), Moistened quartz sand	Mortality Reproduction	0% at 1.5 kg as/ha (3.5 L formulation/ha) 0% effect at 1.5 kg as/ha
Poecilus cupreus	Chlorothalonil 500 g/L SC (Oxon), Moistened quartz sand	Mortality Feeding activity	0% at 1.5 kg as/ha (3.5 L formulation/ha) No significant effects at 1.5 kg as/ha
Aleochara bilineata	Chlorothalonil 75 WG*, Moistened quartz sand	Mortality Reproduction	11% at 1.5 kg as/ha (1.98 kg product/ha) 9% effect at 1.5 kg as/ha
Poecilus cupreus	Chlorothalonil 75 WG*, Moistened quartz sand	Mortality Feeding activity	0% at 1.5 kg as/ha (1.98 kg product/ha) No effects at 1.5 kg as/ha
Poecilus cupreus	Metabolite SDS-3701	Mortality Feeding activity	0% at 10 and 100 mg metabolite/kg soil No effects at 10 and 100 mg metabolite/kg soil

Species	Test Substance	End point	Toxicity
Poecilus cupreus	Metabolite R417888	Mortality Feeding activity	0% and 3% at 100 and 1000 mg metabolite/kg soil No effects at 100 and 1000 mg metabolite/kg soil

[1] 80 g/L azoxystrobin and 400 g/L chlorothalonil

First tier risk assessment for cereals, 750 g a.s./ha, 2x (product: A14111B)

Test substance	Species	Effect (LR_{50} g a.s./ha)	HQ in-field	HQ off-field[1] (1 meter)	Trigger
A14111B	*Typhlodromus pyri*	>2095	<0.61	<0.04	2
A14111B	*Aphidius rhopalosiphi*	>262	<**4.87**	<0.35	2

[1]indicate distance assumed to calculate the drift rate

First tier risk assessment for tomatoes, 1000 g a.s./ha, 1x (product: A14111B)

Test substance	Species	Effect (LR_{50} ml prod/ha)	HQ in-field	HQ off-field[1] (3 meter)	Trigger
A14111B	*Typhlodromus pyri*	>2095	<0.48	<0.04	2
A14111B	*Aphidius rhopalosiphi*	>262	<**3.82**	<0.31	2

[1]indicate distance assumed to calculate the drift rate

First tier risk assessment for cereals, 750 g a.s./ha, 2x (product: Chlorothalonil 500 SC)

Test substance	Species	Effect (LR_{50} g a.s./ha)	HQ in-field	HQ off-field[1] (1 meter)	Trigger
Chlorothalonil 500 SC	*Typhlodromus pyri*	>1500	<0.85	<0.02	2
Chlorothalonil 500 SC	*Aphidius rhopalosiphi*	>1500	<0.85	<0.02	2

[1]indicate distance assumed to calculate the drift rate

First tier risk assessment for tomatoes, 1000 g a.s./ha, 1x (product: Chlorothalonil 500 SC)

Test substance	Species	Effect (LR_{50} g a.s./ha)	HQ in-field	HQ off-field[1] (3 meter)	Trigger
Chlorothalonil 500 SC	*Typhlodromus pyri*	>1500	<0.67	<0.05	2
Chlorothalonil 500 SC	*Aphidius rhopalosiphi*	>1500	<0.67	<0.05	2

[1]indicate distance assumed to calculate the drift rate

First tier risk assessment for potatoes, 750 g a.s./ha, 1x (product: Chlorothalonil 500 SC)

Test substance	Species	Effect (LR_{50} g a.s.ha)	HQ in-field	HQ off-field[1] (1 meter)	Trigger

Test substance	Species	Effect (LR_{50} g a.s.ha)	HQ in-field	HQ off-field[1] (1 meter)	Trigger
Chlorothalonil 500 SC	*Typhlodromus pyri*	>1500	<0.50	<0.01	2
Chlorothalonil 500 SC	*Aphidius rhopalosiphi*	>1500	<0.50	<0.01	2

[1]indicate distance assumed to calculate the drift rate

Extended laboratory tests, aged residue tests

Species	Life stage	Test substance, substrate	Time scale	Dose (kg as/ha)[1,2]	End point	% effect[3]	LR_{50}
Typhlodromus pyri	protonymphs	BRAVO 720 g/L SC*, 52.7% w/w Leaf discs (2-D)	14 d	1.50 1.88 5.63 12.00 18.75 1.50 1.88 5.63 12.00 18.75	Mortality reproduction	0 0 9 17 13 42 47 56 49 64	LR50 >18.75 kg as/ha
Aphidius rhopalosiphi	adult	BRAVO 720 g/L SC*, barley seedlings (3-D)	48 h	4.33 (5.89 L product/ha) 7.70 (10.70 L product/ha) 18.75 (26.04 L product/ha)	Mortality Reproduction	20 20 44 no significant effects at dosages up to 7.70 kg as/ha (at 18.75 kg as/ha the effects of fecundity are not assessed)	LR50 >18.75 kg as/ha
Typhlodromus pyri	protonymphs	Chlorothalonil 500 g/L SC (Syngenta), leaf discs (2-D)	14 d	0.047 1.5 5.4 0.047 1.5 5.4	Mortality Reproduction	0 12.25 9.18 20 70 75	LR50 >5.4 kg as/ha ER50 < 1.5 kg as/ha

Species	Life stage	Test substance, substrate	Time scale	Dose (kg as/ha)[1,2]	End point	% effect[3]	LR_{50}
Typhlodromus pyri	protonymphs	Chlorothalonil 500 g/L SC (Arysta), bean leaf discs (2-D)	14 d	1.5 3.0 6.0 12.0 24.0	Mortality	-3.6 -9.1 5.5 5.5 10.9	LR50 > 24 kg as/ha (48 L product/ha)
				1.5 3.0 6.0 12.0 24.0	Reproduction	65.1 68.7 79.9 81.2 82.0	ER50 < 1.5 kg as/ha (< 3 L prodcut/ha)
Aphidius rhopalosiphi	adult	Chlorothalonil 500 g/L SC (Arysta), barley seedlings (3-D)	48 h	1.5 3.0 6.0 12.0 24.0	Mortality	-3.4 0 0 6.9 6.9	LR50 > 24 kg as/ha (48 L product/ha)
				1.5 3.0 6.0 12.0 24.0	Reproduction	11.6 13.4 21.5 82.6 43.6	
Aphidius rhopalosiphi	adult	Chlorothalonil 75 WG*, barley seedlings (3-D)	48 h	0.47 1.5 5.4	Mortality	16.7 43.3 63.3	
				0.47 1.5 5.4	Reproduction	40 50 64	

Species	Life stage	Test substance, substrate	Time scale	Dose (kg as/ha)[1,2]	End point	% effect[3]	LR_{50}
Typhlodromus pyri	protonymphs	A14111B[4], bean leaf discs (2-D)	14 d	0.017 (312.5 mL product/ha) 0.084 (625 mL product/ha) 0.419 (1250 mL product/ha) 1.048 (2500 mL product/ha) 2.095 (5000 mL product/ha)	Mortality	0 0 0 12	LR50 > 2.095 kg chlorothalonil/ha
				0.017 0.084 0.419 2.095	Reproduction	-1 9 36 58	ER50 = 1.187 kg chlorothalonil/ha
Aphidius rhopalosiphi	adult	A14111B[4], barley seedlings (3-D)	48 h	0.524 (1250 mL product/ha) 1.048 (2500 mL product/ha) 2.095 (5000 mL product/ha)	Mortality	0 0 0	LR50 > 2.095 kg chlorothalonil/ha
				0.524 1.048 2.095	Reproduction	17 27 9	ER50 > 2.095 kg chlorothalonil/ha

Species	Life stage	Test substance, substrate	Time scale	Dose (kg as/ha)[1,2]	End point	% effect[3]	LR_{50}
Chrysoperla carnea	larvae	A14111B[4], bean leaves (2-D)	48 h	0.017 (312.5 mL product/ha) 0.084 (625 mL product/ha) 0.419 (1250 mL product/ha) 1.048 (2500 mL product/ha) 2.095 (5000 mL product/ha)	Mortality	16 10 19 15 7	LR50 > 2.095 kg chlorothalonil/ha
				0.017 0.084 0.419 1.048 2.095	Reproduction	0 0 0	ER50 > 2.095 kg chlorothalonil/ha

[1] indicate whether initial or aged residues
[2] for preparations indicate whether dose is expressed in units of a.s. or preparation
[3] indicate if positive percentages relate to adverse effects or not
[4] 80 g/L azoxystrobin and 400 g/L chlorothalonil
*Different formulations than the representative ones. Those, however, can be considered worst-case in terms of content of active substance

Risk assessment for cereals, 750 g a.s./ha, 2x (product: A14111B), based on extended lab tests

Species	ER_{50} (ml prod/ha)	In-field rate (mL prod/ha)	Off-field rate[1] (mL prod/ha) (1 meter)
Typhlodromus pyri	**2833** (2-D)	3188	37.9
Aphidius rhopalosiphi	>5000 (3-D)	3188	379

[1]indicate distance assumed to calculate the drift rate and if 3D or 2D.

Risk assessment for tomatoes, 1000 g a.s./ha, 1x (product: A14111B), based on extended lab tests

Species	ER_{50} (g a.s./ha)	In-field rate (mL prod/ha)	Off-field rate[1] (mL prod/ha) (1 meter)
Typhlodromus pyri	2833 (2-D)	2500	100.3

Species	ER_{50} (g a.s./ha)	In-field rate (mL prod/ha)	Off-field rate[1] (mL prod/ha) (1 meter)
Aphidius rhopalosiphi	>5000 (3-D)	2500	1002.5

[1]indicate distance assumed to calculate the drift rate and if 3D or 2D.

Risk assessment for cereals, 750 g a.s./ha, 2x (product: Chlorothalonil 500 SC), based on extended lab tests*

Species	ER_{50} (g a.s./ha)	In-field rate (g a.s./ha)	Off-field rate[1] (g a.s./ha) (3 meter)
Typhlodromus pyri	**<1500** (2-D)	3188	37.9
Aphidius rhopalosiphi	>24000 (3-D)	3188	379

[1]indicate distance assumed to calculate the drift rate and if 3D or 2D.
*The risk assessment for Chlorothalonil 500 SC is considered to also cover ARY 0474-001 considering the content in a.s.

Risk assessment for tomatoes, 1000 g a.s./ha, 1x (product: Chlorothalonil 500 SC), based on extended lab tests*

Species	ER_{50} (g a.s./ha)	In-field rate (g a.s./ha)	Off-field rate[1] (g a.s./ha) (3 meter)
Typhlodromus pyri	<1500 (2-D)	2500	100.3
Aphidius rhopalosiphi	>24000 (3-D)	2500	1002.5

[1]indicate distance assumed to calculate the drift rate and if 3D or 2D.
*The risk assessment for Chlorothalonil 500 SC is considered to also cover ARY 0474-001 considering the content in a.s.

Semi-field tests
Not required
Field studies
Not required
Additional specific test
Not required

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./ o.m.[1]	Time scale	End point	Toxicity
Earthworms					
Eisenia andrei	Chlorothalonil	Homogenous mixing/ 10% o.m.	Chronic (56-d)	Growth, reproduction, behaviour	NOEC = 50 mg a.s./kg d.w. soil NOECcorr=25 mg a.s./kg d.w. soil
Eisenia fetida	Chlorothalonil	Homogenous mixing/ 5% o.m.	Chronic (56-d)	Growth, reproduction, behaviour	NOEC = 100 mg a.s./kg d.w. soil NOECcorr=50 mg a.s./kg d.w. soil
Eisenia andrei	BRAVO 500	Homogenous mixing/ 5.74% o.m.	Chronic (56-d)	Growth, reproduction, behaviour	NOEC = 5 mg a.s./kg d.w. soil NOECcorr=2.5 mg a.s./kg d.w. soil
Eisenia fetida	A14111B[2]	Homogenous mixing/ 10% o.m	Chronic (56-d)	Growth, reproduction, behaviour	NOEC = 27.5 mg a.s/kg d.w. soil (80 mg A14111B/kg d.w. soil) NOECcorr=13.75 mg a.s./kg d.w. soil
Eisenia fetida	Chlorothalonil 500 g/L SC (Oxon)	Applied to the soil surface/ 10% o.m*	Chronic (56-d)	Growth, reproduction, behaviour	NOEC = 1.5 mg a.s./kg soil, 3.0 mg product/kg soil) NOECcorr=0.75 mg a.s./kg d.w. soil
Eisenia fetida	ARY-0474-001 (chlorothalonil 500 g/L)	Homogenous mixing/ 5% o.m.	Chronic (56-d)	Growth, reproduction, behaviour	NOEC =9.00 mg a.s./kg soil NOECcorr=4.5 mg a.s./kg d.w. soil
Eisenia andrei	R182281 (SDS3701)	Homogenous mixing/ 10% o.m.	Chronic (56-d)	Growth, reproduction, behaviour	NOEC = 10 mg metabolite/kg d.w. soil
Eisenia fetida	R182281 (SDS3701)	Homogenous mixing/ 5% o.m	Chronic (56-d)	Growth, reproduction, behaviour	EC10 = 11 mg metabolite /kg d.w. soil
Eisenia fetida	R182281 (SDS3701)	Homogenous mixing/ 10% o.m	Chronic (56-d)	Growth, reproduction, behaviour	NOEC = 25 mg metabolite /kg d.w. soil

Test organism	Test substance	Application method of test a.s./ o.m.[1]	Time scale	End point	Toxicity
Eisenia andrei	R417888 (VIS01)	Homogenous mixing/ 10% o.m	Chronic (56-d)	Growth, reproduction, behaviour	NOEC (reproduction) = 100 mg metabolite /kg d.w. soil EC10 (body weight) = 2.2 mg metabolite /kg d.w. soil
Eisenia fetida	R417888 (VIS01)	Homogenous mixing/ 5% o.m	Chronic (56-d)	Growth, reproduction, behaviour	NOEC = 12.5 mg metabolite /kg d.w. soil
Eisenia fetida	SYN548708 (R418503)	Homogenous mixing/ 5% o.m	Chronic (56-d)	Growth, reproduction, behaviour	NOEC =0.66 mg metabolite /kg d.w. soil[3]
Eisenia fetida	SYN548765 (R419492)	Homogenous mixing/ 5% o.m	Chronic (56-d)	Growth, reproduction, behaviour	NOEC = 6.28 mg metabolite /kg d.w. soil[3]
Eisenia fetida	SYN548766 (R471811)	Homogenous mixing/ 5% o.m	Chronic (56-d)	Growth, reproduction, behaviour	NOEC = 5.94 mg metabolite /kg d.w. soil[3]
Eisenia fetida	SYN507900 (SDS66882)	Homogenous mixing/ 5% o.m	Chronic (56-d)	Growth, reproduction, behaviour	NOEC =1.78 mg metabolite /kg d.w. soil[3]
Eisenia fetida	R611965 (SDS46851)	Homogenous mixing/ 5% o.m	Chronic (56-d)	Growth, reproduction, behaviour	NOEC =4.78 mg metabolite /kg d.w. soil[3]
Eisenia fetida	R611966 (SDS47523)	Homogenous mixing/ 5% o.m	Chronic (56-d)	Growth, reproduction, behaviour	NOEC =0.58 mg metabolite /kg d.w. soil[3]
Eisenia fetida	R611967 (SDS47524)	Homogenous mixing/ 5% o.m	Chronic (56-d)	Growth, reproduction, behaviour	NOEC = 0.78 mg metabolite /kg d.w. soil[3]
Eisenia fetida	R613636 (SDS19221)	Homogenous mixing/ 5% o.m	Chronic (56-d)	Growth, reproduction, behaviour	NOEC = 0.84 mg metabolite /kg d.w. soil[3]
Other soil macro-organisms					
Folsomia candida	BRAVO 500	Homogenous mixing/ 5.74% o.m	Chronic (28-d)	Mortality and reproduction	EC20 = 18.2 mg a.s./kg d.w. soil EC20corr=9.1 mg a.s./kg d.w. soil

Test organism	Test substance	Application method of test a.s./ o.m.[1]	Time scale	End point	Toxicity
Folsomia candida	A14111B[2]	Homogenous mixing/ 5% o.m	Chronic (28-d)	Reproduction Mortality	EC10 = 12 mg a.s./kg d.w. soil (35 mgA14111B/kg d.w. soil) **EC10corr=6 mg a.s./kg d.w. soil** EC20=27 mg a.s./kg d.w. soil (81 mg A14111B/kg d.w. soil) NOEC=18 mg a.s./kg d.w. soil (53 mg A14111B/kg d.w. soil) NOEC=1000 mg A14111B/kg d.w. soil
Folsomia candida	R182281 (SDS3701)	Homogenous mixing/ 10% o.m	Chronic (28-d)	Mortality and reproduction	NOEC = 59.6 mg a.s./kg d.w. soil
Folsomia candida	R417888 (VIS01)	Homogenous mixing/ 10% o.m	Chronic (28-d)	Mortality and reproduction	EC10 = 3.1 mg a.s./kg d.w. soil
Folsomia candida	SYN548708 (R418503)	Homogenous mixing/ 5% o.m	Chronic (28-d)	Mortality and reproduction	NOEC = 0.66 mg metabolite /kg d.w. soil[3]
Folsomia candida	SYN548765 (R419492)	Homogenous mixing/ 5% o.m	Chronic (28-d)	Mortality and reproduction	NOEC = 6.28 mg metabolite /kg d.w. soil[3]
Folsomia candida	SYN548766 (R471811)	Homogenous mixing/ 5% o.m	Chronic (28-d)	Mortality and reproduction	NOEC = 5.94 mg metabolite /kg d.w. soil[3]
Folsomia candida	SYN507900 (SDS66882)	Homogenous mixing/ 5% o.m	Chronic (28-d)	Mortality and reproduction	NOEC = 1.78 mg metabolite /kg d.w. soil[3]
Folsomia candida	R611965 (SDS46851)	Homogenous mixing/ 5% o.m	Chronic (28-d)	Mortality and reproduction	NOEC = 4.78 mg metabolite /kg d.w. soil[3]
Folsomia candida	R611966 (SDS47523)	Homogenous mixing/ 5% o.m	Chronic (28-d)	Mortality and reproduction	NOEC = 0.58 mg metabolite /kg d.w. soil[3]

Test organism	Test substance	Application method of test a.s./ o.m.[1]	Time scale	End point	Toxicity
Folsomia candida	R611967 (SDS47524)	Homogenous mixing/ 5% o.m	Chronic (28-d)	Mortality and reproduction	NOEC = 0.78 mg metabolite /kg d.w. soil[3]
Folsomia candida	R613636 (SDS19221)	Homogenous mixing/ 5% o.m	Chronic (28-d)	Mortality and reproduction	NOEC = 0.84 mg metabolite /kg d.w. soil[3]
Hypoaspis aculeifer	Chlorothalonil 500 SC (A7867A)	Homogenous mixing/ 5% o.m	Chronic (14-d)	Mortality and reproduction	NOEC= 399 mg a.s./kg d.w. soil (1000 mg A7867A/kg d.w. soil) EC10corr=199.5 mg a.s./kg d.w. soil
Hypoaspis aculeifer	R182281 (SDS3701)	Homogenous mixing/ 5% o.m	Chronic (14-d)	Mortality and reproduction	NOEC=7.02 mg metabolite /kg d.w. soil
Hypoaspis aculeifer	R417888 (VIS01)	Homogenous mixing/ 5% o.m	Chronic (14-d)	Mortality and reproduction	NOEC=6.76 mg metabolite /kg d.w. soil
Hypoaspis aculeifer	SYN548708 (R418503)	Homogenous mixing/ 5% o.m	Chronic (14-d)	Mortality and reproduction	NOEC = 0.66 mg metabolite /kg d.w. soil[3]
Hypoaspis aculeifer	SYN548765 (R419492)	Homogenous mixing/ 5% o.m	Chronic (14-d)	Mortality and reproduction	NOEC = 6.28 mg metabolite /kg d.w. soil[3]
Hypoaspis aculeifer	SYN548766 (R471811)	Homogenous mixing/ 5% o.m	Chronic (14-d)	Mortality and reproduction	NOEC = 5.94 mg metabolite /kg d.w. soil[3]
Hypoaspis aculeifer	SYN507900 (SDS66882)	Homogenous mixing/ 5% o.m	Chronic (14-d)	Mortality and reproduction	NOEC =1.78 mg metabolite /kg d.w. soil[3]
Hypoaspis aculeifer	R611965 (SDS46851)	Homogenous mixing/ 5% o.m	Chronic (14-d)	Mortality and reproduction	NOEC = 4.78 mg metabolite /kg d.w. soil
Hypoaspis aculeifer	R611966 (SDS47523)	Homogenous mixing/ 5% o.m	Chronic (14-d)	Mortality and reproduction	NOEC = 0.58 mg metabolite /kg d.w. soil[3]
Hypoaspis aculeifer	R611967 (SDS47524)	Homogenous mixing/ 5% o.m	Chronic (14-d)	Mortality and reproduction	NOEC = 0.78 mg metabolite /kg d.w. soil[3]
Hypoaspis aculeifer	R613636 (SDS19221)	Homogenous mixing/ 5% o.m	Chronic (14-d)	Mortality and reproduction	~~EC10 > 0.84 and~~ NOEC ≥ = 0.84 mg metabolite /kg d.w. soil

[1]To indicate whether the test substance was oversprayed/to indicate the organic content of the test soil (e.g. 5 % or 10 %).
* Test substance was sprayed on to the soil surface.In accordance with Regulation 284/2013 the test item should have been incorporated.
[2] 80 g/L azoxystrobin and 400 g/L chlorothalonil

3The study design is not considere fully appropriate considering that a mixture of different metabolites has been tested, each at a single concentration

Higher tier testing: litter bags				
Litter bag	R182281 (SDS3701)	…..	196 days	No significant effects at a dose rate of 3400 g SDS-3701/ha
Litter bag	R182281 (SDS3701)	……	60 days	No significant effects at a dose rate of 2.0 mg SDS-3701/ha

Higher tier testing: field study

The effects of the test item Chlorothalonil 500 g/L SC (Oxon) were assessed on species composition and biomass of a field earthworm population in grassland in Northern Switzerland. The test item was applied in two applications with an interval of 18 days on grassland. . For the first application, 1.25 kg a.s./ha was applied. For the second application, the application rate was increased to 2.5 kg a.s./ha to compensate for the increase of vegetation cover.

Numbers of tanylobous juveniles were low throughout the study, but numbers of epilobous juveniles were sufficiently high to allow statistical analysis (which was however not conducted). Chlorothalonil appears not to have affected the number of Epilobous juveniles. The number of adult worms was low before application, and the numbers of individuals per species were low throughout the study, except for Aporrectodea rosea and Aporrectodea longa (at least at some samplings). The only species for which a conclusion might be drawn were Aporrectodea rosea (an endogeaic species) and A. longa (anoecic species). Results for Aporrectodea rosea and A. longa indicate that chlorothalonil did not reduce abundance of these species (although statistical analysis was not performed for these species). Conclusions cannot be drawn for epigaeic species and tanylobous juveniles. Considering the overall low densities of the identified species, the study is not considered sufficiently robust to draw conclusions on species or class level. Chlorothalonil did not affect total abundance and biomass of the earthworm population. The soil concentrations were calculated to be 0.358 and 0.708 mg a.s./kg dry soil at the 1^{st} and 2^{nd} application, respectively.
The field study was discussed in the Pesticide Peer Review meeting 165~~of 18-22 September, 2017~~. Concerns were raised regarding the robustness of the study to detect effects. Effects after 12 months were still observed; *Lumbriculus* was not present in the study; the number of juveniles for some species was too low for concluding; the study started in the end of July which was considered too late in the season; the statistical power is unknown. In general, the study does not fully comply with the ISO guideline. The assessment at species level was not performed. Significant differences between the control and the treatment plots were noted before the treatments. Overall, ~~the~~ MS and EFSA agreed that the risk identified for the ~~Oxon~~ the representative formulation Chlorothalonil 500 g/L SC at the Tier I could not be excluded via the results of this field study.

Test type	Test substance	Time scale (days)	Effects
Nitrogen transformation	Chlorothalonil	28	<25% effect at day 28 at 4.4 mg a.s./kg d.w. soil
Nitrogen transformation	Chlorothalonil	28	<25% effect at day 28 at 10.0 mg a.s./kg d.w. soil
Nitrogen transformation	BRAVO 720 g/L SC, 53.1% w/w	28	<25% effect at day 28 at 3.2 and 4.8 mg a.s./kg d.w. soil
Nitrogen transformation	A14111B	28	<25% effect at day 28 at 2.57 mg chlorothalonil/kg d.w. soil (8.07 mg product/kg d.w. soil)
Nitrogen transformation	Chlorothalonil 75 WG	28	<25% effect at day 28 at 3.3 mg a.s./kg d.w. soil (4.4 mg product/kg d.w. soil)

Nitrogen transformation	R182281 (SDS3701)	28	<25% effect at day 28 at 1.3 mg metabolite/kg d.w. soil
Nitrogen transformation	R182281 (SDS3701)	28	<25% effect at day 28 at 2.9 and 5.8 mg metabolite/kg d.w. soil
Nitrogen transformation	R611965 (SDS46851)	28	<25% effect at day 28 at 1.25 and 2.5 mg metabolite/kg d.w. soil
Nitrogen transformation	R417888 (VIS01)	28	<25% effect at day 28 at 2.48 and 4.96 mg metabolite/kg d.w. soil
Nitrogen transformation	R417888 (VIS01)	28	<25% effect at day 28 at 1.5 and 3.0 mg metabolite/kg d.w. soil
Nitrogen transformation	SYN548708 (R418503)	28	<25% effect at day 28 at 0.66 mg metabolite/kg d.w. soil[1]
Nitrogen transformation	SYN548765 (R419492)	28	<25% effect at day 28 at 6.28 mg metabolite/kg d.w. soil[1]
Nitrogen transformation	SYN548766 (R471811)	28	<25% effect at day 28 at 5.94 mg metabolite/kg d.w. soil[1]
Nitrogen transformation	SYN507900 (SDS66882)	28	<25% effect at day 28 at 1.78 mg metabolite/kg d.w. soil[1]
Nitrogen transformation	R611966 (SDS47523)	28	<25% effect at day 28 at 0.58 mg metabolite/kg d.w. soil[1]
Nitrogen transformation	R611967 (SDS47524)	28	<25% effect at day 28 at 0.78 mg metabolite/kg d.w. soil[1]
Nitrogen transformation	R613636 (SDS19221)	28	<25% effect at day 28 at 0.84 mg metabolite/kg d.w. soil[1]

[1]The study design is not considere fully appropriate considering that a mixture of different metabolites has been tested, each at a single concentration

Toxicity/exposure ratios for soil organisms

Earthworms

Compound	Time scale	EC10/NOECcorr (mg a.s./metabolite / kg soil)	Soil PEC (mg as/kg soil)	TER	Trigger
Wheat,Barley 2x 750 g a.s./ha, interval 14 days					
Chlorothalonil	Chronic	2.5	0.342[1]	7.3	5
A14111B	Chronic	13.8	0.342	40.4	5
Chlorothalonil 500 g/L SC	Chronic	0.75	0.342	**2.2**	5
ARY-0474-001 (chlorothalonil 500 g/L)	Chronic	4.5	0.342	13.1	5
R182281(SDS3701)	Chronic	11	0.351[2]	31.3	5
R417888 (VIS01)	Chronic	2.2	0.338[2]	6.5	5
SYN548708 (R418503)	Chronic	0.66	0.147[2]	4.5*	5
SYN548765 (R419492)	Chronic	6.28	0.314[2]	20	5
SYN548766 (R471811)	Chronic	5.94	0.297[2]	20	5
SYN507900 (SDS66882)	Chronic	1.78	0.056[2]	31.8	5
R611965 (SDS46851)	Chronic	4.78	0.239[2]	20	5
R611966 (SDS47523)	Chronic	0.58	0.037[2]	15.7	5
R611967 (SDS47524)	Chronic	0.78	0.039[1]	20	5
R613636 (SDS19221)	Chronic	0.84	0.042[1]	20	5
Tomatoes, 1x 1000 g a.s./ha					
Chlorothalonil	Chronic	2.5	0.267[1]	9.4	5
A14111B	Chronic	13.8	0.267[1]	51.7	5
Chlorothalonil 500 g/L SC		0.75	0.267[1]	**2.8**	5
ARY-0474-001 (chlorothalonil 500 g/L)		4.5	0.267[1]	16.8	5
R182281	Chronic	11	0.234[2]	47.0	5
R417888	Chronic	2.2	0.225[2]	9.8	5
SYN548708 (R418503)	Chronic	0.66	0.098[2]	6.7	5
SYN548765 (R419492)	Chronic	6.28	0.209[2]	30	5
SYN548766 (R471811)	Chronic	5.94	0.197[2]	30.2	5
SYN507900 (SDS66882)	Chronic	1.78	0.039[2]	45.6	5
R611965 (SDS46851)	Chronic	4.78	0.159[2]	30.1	5
R611966 (SDS47523)	Chronic	0.58	0.025[2]	23.2	5
R611967 (SDS47524)	Chronic	0.78	0.033[1]	23.6	5
R613636 (SDS19221)	Chronic	0.84	0.030[1]	28	5

[1] PEC soil initial max
[2] PEC peak accum
*Although the TER are below the trigger, low risk is concluded considering that: (i) a single concentration was tested showing no adverse effects.

Compound	Time scale	NOECcorr (mg a.s./metabolite / kg soil)	Soil PEC (mg as/kg soil)	TER	Trigger

potatoes, 1x 750 g a.s./ha					
Chlorothalonil	Chronic	2.5	0.150[1]	16.7	5
Chlorothalonil 500 g/L SC	Chronic	0.75	0.150[1]	5.0	5
R182281(SDS3701)	Chronic	11	0.131[2]	84	5
R417888 (VIS01)	Chronic	2.2	0.126[2]	17.5	5
SYN548708 (R418503)	Chronic	0.66	0.055[2]	12.0	5
SYN548765 (R419492)	Chronic	6.28	0.117[2]	53.7	5
SYN548766 (R471811)	Chronic	5.94	0.111[2]	53.5	5
SYN507900 (SDS66882)	Chronic	1.78	0.023[2]	77.4	5
R611965 (SDS46851)	Chronic	4.78	0.089[2]	53.7	5
R611966 (SDS47523)	Chronic	0.58	0.014[2]	41.4	5
R611967 (SDS47524)	Chronic	0.78	0.019[1]	41.1	5
R613636 (SDS19221)	Chronic	0.84	0.017[1]	49.4	5

[1] PEC soil initial max
[2] PEC peak accu

Other soil meso- and macrofauna

Folsomia candida

Compound	**Time scale**	**EC10corr/NOECcorr (mg a.s./metabolite / kg soil)**	Soil PEC **(mg as/kg soil)**	**TER**	**Trigger**
Wheat,Barley 2x 750 g a.s./ha, interval 14 days					
Chlorothalonil (BRAVO 500)	Chronic	9.1*	0.342[1]	26.6	5
A14111B	Chronic	6	0.342[1]	17.5	5
R182281(SDS3701)	Chronic	59.6	0.351[2]	170	5
R417888(VIS01)	Chronic	3.1	0.338[2]	9.2	5
SYN548708 (R418503)	Chronic	0.66	0.147[2]	**4.5**	5
SYN548765 (R419492)	Chronic	6.28	0.314[2]	20	5
SYN548766 (R471811)	Chronic	5.94	0.297[2]	20	5
SYN507900 (SDS66882)	Chronic	1.78	0.056[2]	31.8	5
R611965 (SDS46851)	Chronic	4.78	0.239[2]	20	5
R611966 (SDS47523)	Chronic	0.58	0.037[2]	15.7	5
R611967 (SDS47524)	Chronic	0.78	0.039[1]	20	5
R613636 (SDS19221)	Chronic	0.84	0.042[1]	20	5
Tomatoes, 1x 1000 g a.s./ha					
Chlorothalonil (BRAVO 500)	Chronic	9.1	0.267[1]	34.1	5
A14111B	Chronic	6	0.267[1]	22.5	5
R182281(SDS3701)	Chronic	59.6	0.234[2]	255	5
R417888(VIS01)	Chronic	3.1	0.225[2]	13.8	5
SYN548708 (R418503)	Chronic	0.66	0.098[2]	6.7	5
SYN548765 (R419492)	Chronic	6.28	0.209[2]	30	5
SYN548766 (R471811)	Chronic	5.94	0.197[2]	30.2	5
SYN507900 (SDS66882)	Chronic	1.78	0.039[2]	45.6	5
R611965 (SDS46851)	Chronic	4.78	0.159[2]	30.1	5
R611966 (SDS47523)	Chronic	0.58	0.025[2]	23.2	5
R611967 (SDS47524)	Chronic	0.78	0.033[1]	23.6	5
R613636 (SDS19221)	Chronic	0.84	0.030[1]	28	5
Potatoes, 1x 750 g a.s./ha					

Chlorothalonil (BRAVO 500)	Chronic	9.1	0.150[1]	60.7	5
R182281(SDS3701)	Chronic	59.6	0.131[2]	455	5
R417888(VIS01)	Chronic	3.1	0.126[2]	24.6	5
SYN548708 (R418503)	Chronic	0.66	0.055[2]	12	5
SYN548765 (R419492)	Chronic	6.28	0.117[2]	53.7	5
SYN548766 (R471811)	Chronic	5.94	0.111[2]	53.5	5
SYN507900 (SDS66882)	Chronic	1.78	0.023[2]	77.4	5
R611965 (SDS46851)	Chronic	4.78	0.089[2]	53.7	5
R611966 (SDS47523)	Chronic	0.58	0.014[2]	41.4	5
R611967 (SDS47524)	Chronic	0.78	0.019[1]	41.1	5
R613636 (SDS19221)	Chronic	0.84	0.017[1]	49.4	5

PEC soil initial max
[2] PEC peak accum

Hypoaspis aculeifer

Compound	Time scale	NOECcorr (mg a.s./metabolite / kg soil)	Soil PEC (mg as/kg soil)	TER	Trigger
Potatoes, 1x 750 g a.s./ha					
Chlorothalonil 500 g/L SC	Chronic	199.5	0.150[1]	1330	5
R182281(SDS3701)	Chronic	7.02	0.131[2]	53.6	5
R417888(VIS01)	Chronic	6.76	0.126[2]	53.7	5
SYN548708 (R418503)	Chronic	0.66	0.055[2]	12.0	5
SYN548765 (R419492)	Chronic	6.28	0.117[2]	53.7	5
SYN548766 (R471811)	Chronic	5.94	0.111[2]	53.5	5
SYN507900 (SDS66882)	Chronic	1.78	0.023[2]	77.4	5
R611965 (SDS46851)	Chronic	4.78	0.089[2]	53.7	5
R611966 (SDS47523)	Chronic	0.58	0.014[2]	41.4	5
R611967 (SDS47524)	Chronic	0.78	0.019[1]	41.1	5
R613636 (SDS19221)	Chronic	0.84	0.017[1]	49.4	5
Wheat,Barley 2x 750 g a.s./ha, interval 14 days					
Chlorothalonil 500 g/L SC	Chronic	199.5	0.342[1]	583	5
R182281(SDS3701)	Chronic	7.02	0.351[2]	20	5
R417888(VIS01)	Chronic	6.76	0.338[2]	20	5
SYN548708 (R418503)	Chronic	0.66	0.147[2]	4.5	5
SYN548765 (R419492)	Chronic	6.28	0.314[2]	20	5
SYN548766 (R471811)	Chronic	5.94	0.297[2]	20	5
SYN507900 (SDS66882)	Chronic	1.78	0.056[2]	31.8	5
R611965 (SDS46851)	Chronic	4.78	0.239[2]	20	5
R611966 (SDS47523)	Chronic	0.58	0.037[2]	15.7	5
R611967 (SDS47524)	Chronic	0.78	0.039[1]	20	5
R613636 (SDS19221)	Chronic	0.84	0.042[1]	20	5
Tomatoes, 1x 1000 g a.s./ha					
Chlorothalonil 500 g/L SC	Chronic	199.5	0.267[1]	747.2	5
R182281(SDS3701)	Chronic	7.02	0.234[2]	30.0	5
R417888(VIS01)	Chronic	6.76	0.225[2]	28.9	5
SYN548708 (R418503)	Chronic	0.66	0.098[2]	2.9	5
SYN548765 (R419492)	Chronic	6.28	0.209[2]	64.1	5
SYN548766 (R471811)	Chronic	5.94	0.197[2]	28.4	5
SYN507900 (SDS66882)	Chronic	1.78	0.039[2]	9.0	5
R611965 (SDS46851)	Chronic	4.78	0.159[2]	122.6	5
R611966 (SDS47523)	Chronic	0.58	0.025[2]	3.6	5
R611967 (SDS47524)	Chronic	0.78	0.033[1]	31.2	5

R613636 (SDS19221)	Chronic	0.84	0.030[1]	28.0	5

[1] PEC soil initial max
[2] PEC peak accum

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

Test with chlorothalonil and the following species: *Fagopyrum esculentum; Zea mays; Cucumis sativus, Brassica kaber; Avena sativa; Allium cepa; Raphanus sativus; Sorghum bicolor; Glycine max; Lycopersicon esculentem*: NOEL (germination, emergence, vigor) is 18 kg a.s./ha.

Laboratory dose response tests

Species	Test substance	ER_{50} vegetative vigour (g a.s./ha)	ER_{50} emergence (g a.s./ha)	Exposure[1] (g a.s./ha)	TER	Trigger
Avena sativa, Zea mays, Allium cepa, Glycine max, Daucus carota and Brassica oleracea	Chlorothalonil 75 WG*	>-3150 g a.s./ha	-	80.2	>39.3	5
maize, onion, sorghum, oat, radish, white mustard , cucumber, tomato, buckwheat and soybean	ARY-0474-001	>-4000 g a.s./ha	>4000 g a.s./ha	80.2	>49.9	5
Allium cepa	SDS-3701	-	143 g SDS-3701/ha (= 0.19 mg SDS-3701/kg soil	0.019 mg SDS-3701/kg soil[3]	10	5
Extended laboratory studies : Not available Semi-field and field test: Not available						

[1] exposure estimated based on Ganzelmeier drift data for the worst-case use in tomato
data for the worst-case use in cereals (2 x application) (regarding soil concentrations this is the worst-case use)
*Different formulation than the representative one has been tested.

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

Test type/organism	end point
Activated sludge	3-h EC50 > 1000 mg a.s./L
Pseudomonas sp	Not available

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. Available monitoring data concerning effect of the PPP.

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

Compartment	
Soil	Chlorothalonil
Water	Chlorothalonil, R613841, pending: R613841, R418503, R419492, R471811, SYN507900, R611966, R611967, SYN546671, R613841, U38, U40, U44, PD2 (R613801), PD1 (R613911), SYN546934, PD4, PD5 (SYN549430)
Sediment	Chlorothalonil
groundwater	Chlorothalonil, R613841, pending: R613841, R418503, R419492, R471811, SYN507900, R611966, R611967, SYN546671, R613841, U38, U40, U44, PD2 (R613801), PD1 (R613911), SYN546934, PD4, PD5 (SYN549430)

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

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

Substance	Chrlorothalonil
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][6]:	Aquatic Acute 1 (H400), M-factor 10 Aquatic Chronic 1 (H410), M-factor 10
Peer review proposal[7] for classification according to Regulation (EC) No 1272/2008:	Aquatic Acute 1 (H400), M-factor 100 Aquatic Chronic 1 (H410), M-factor 100

[6] 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.

[7] It should be noted that harmonised classification and labelling is formally proposed and decided in accordance with Regulation (EC) No 1272/2008.